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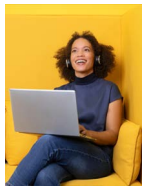
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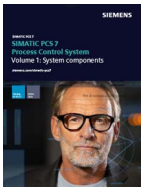
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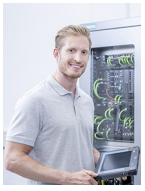
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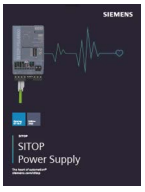
SiePortal
Information and Ordering Platform on the Internet

sieportal.siemens.com



SITOP KT 10.1
SITOP
Power Supply

PDF (E86060-D4001-A510-E1)



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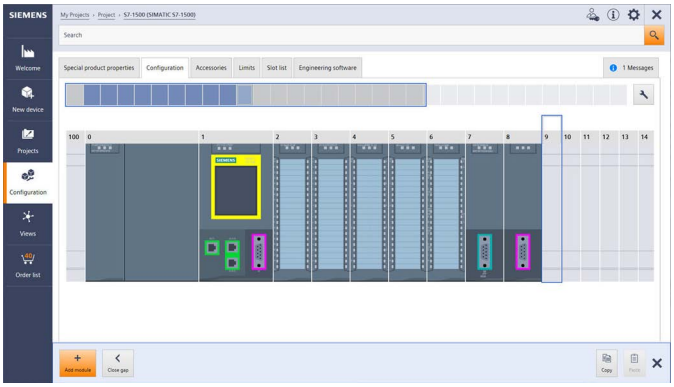




TIA Selection Tool – quick, easy, smart configuration

For you to get the most out of our portfolio quickly and easily.

Do you always need the optimum configuration for planning your project?
For your application we offer the TIA Selection Tool to support all project planners, beginners and experts alike.
No detailed portfolio knowledge is necessary.
TIA Selection Tool is available for download as a free desktop version or a cloud variant.



Your Advantages

Quick

- Configure a complete project with just a few entries – without a manual, without special knowledge
- Import and export of hardware configuration to TIA Portal or other systems
- Ideal visualization of the projects to be configured

Easy

- Tool download either as desktop version or web-based cloud version
- Technically always up-to-date about product portfolio and innovative approaches
- Highly flexible, secure, cross-team work in the cloud
- Direct ordering in SiePortal

Smart

- Smart selection wizard for error-free configuration and ordering
- Configuration options can be tested and simulated in advance
- Library for archiving sample configurations

The TIA Selection Tool is a completely paperless solution.
Download it now:
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For more information, scan the QR code

Products for Totally Integrated Automation

SIMATIC



Catalog ST 70 · 2026

Supersedes:
Catalog ST 70 · 2025

Refer to SiePortal for current updates of this catalog:
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The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with DIN EN ISO 9001 (Certified Registration No. 1323QM-15). The certificate is recognized by all IQNet countries.





Sustainability @Siemens

Transforming the everyday to create a better tomorrow.



For more information, see www.siemens.com/sustainability

As a company, Siemens considers environmental, social and governance (ESG) criteria from all angles with its DEGREE framework (decarbonization, ethics, governance, resource efficiency, equity and employability). We are not only committed to reducing the carbon footprint in our own operations to net zero by 2030, but also helping our customers achieve their decarbonization and sustainability goals.

Mission & strategy

As a focused technology company, Siemens is committed to addressing the world's most profound challenges by leveraging the synergies between digitalization and sustainability.

Technology with aim and purpose

We develop technologies that connect the real and digital worlds and enable our customers to positively transform the industries that form the backbone of our economy: industry, infrastructure, transportation and healthcare.

Our contribution

Siemens makes an impact every day by providing innovative solutions in response to challenges relating to environmental protection, decarbonization, health and safety. Innovative solutions that have a clear goal: to make the world more sustainable, more integrative and a better place to live.

Sustainability facts

For almost 175 years, Siemens has been driven by the desire to improve the lives of people around the world with our technologies.

Siemens EcoTech

Siemens EcoTech is a framework for products that promotes the sustainable transformation of industry and infrastructure. The framework offers you transparency regarding the performance of our evaluated products in terms of environmental criteria, so that you can make informed decisions in order to achieve your sustainability goals, see www.siemens.com/SiemensEcoTech.

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Overview



- The compact, easy-to-use and low-cost solution for simple control tasks
- Compact, easy to operate, universally applicable without accessories
- "All in one": Integrated display and operator panel
- 46 different functions can be connected at the press of a button or by means of PC software; up to 800 times in total
- Functions are easy to change at the press of a button. No more time-consuming rewiring

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Overview

- The controller for use in the toughest ambient conditions
- With extended temperature range from -40/-25 °C to +70 °C
- Suitable for exposure to environmental substances (harmful gas atmosphere)
- Condensation permissible
- With the proven PLC technology of LOGO!
- Easy to handle, program, maintain, and service
- Ideal for use in automotive engineering, environmental engineering, mining, chemical plants, conveyor technology, food industry, etc.

Accessories:

- The front panel mounting kit also allows simple and reliable installation of the logic modules in front panels; degree of protection IP65 is thus possible.
- In order to ensure dependable operation of devices supplied by the battery in conjunction with combustion engines, it is necessary to put in a SIPLUS upmiter upstream device between the battery and the SIPLUS LOGO!.

More information is available at this link.

Technical specifications

General technical specifications of the SIPLUS LOGO!	
Range of ambient temperature	-40/-25 ... +70 °C
Conformal coating	Coating of the printed-circuit boards and the electronic components
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Extended range of ambient conditions	

• With reference to ambient temperature, air pressure and installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) //
	Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) //
	Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)

• At cold restart, min.	0 °C
Relative humidity	
• With condensation, max.	100%; RH incl. condensation/frost (no commissioning in bedewed state)
Resistance	
• To biologically active substances/compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• To chemically active substances/compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• To mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

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Overview



- The space-saving basic versions
- Interface for connecting expansion modules, up to 64 digital inputs, 60 digital outputs, 16 analog inputs and 16 analog outputs can be addressed
- All basic devices with integrated web server for display-based web pages and/or user-defined web pages
- Enclosure width 72 mm (4 MW)
- All basic units with Ethernet interface for communication with LOGO!, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard microSD cards for additional functions, e.g. copy program, data logging, copy protection

Selection and ordering data

LOGO! 9 logic module	
LOGO! 24CE Logic module, display PS/I/O: 24 V/24 V/24 V trans., 8 DI (4 AI)/4 DO, memory 800 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V9, older projects executable, cloud connection, MQTT in all LOGO! 9 basic devices	**6ED1052-1CC08-0BA3**
LOGO! 12/24RCE Logic module, display PS/I/O: 12/24 V DC/relay, 8 DI (4 AI)/4 DO, memory 800 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V9, older projects executable, cloud connection, MQTT in all LOGO! 9 basic devices	**6ED1052-1MD08-0BA3**
LOGO! 24RCE Logic module, display PS/I/O: 24 V AC/24 V DC/relay, 8 DI/4 DO, memory 800 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V9, older projects executable, cloud connection, MQTT in all LOGO! 9 basic devices	**6ED1052-1HB08-0BA3**
LOGO! 230RCE Logic module, display PS/I/O: 115 V/230 V/relay, 8 DI/4 DO, memory 800 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V9, older projects executable, cloud connection, MQTT in all LOGO! 9 basic devices	**6ED1052-1FB08-0BA3**
LOGO! 8 logic module	
LOGO! 24CE Logic module, display PS/I/O: 24 V/24 V/24 V trans., 8 DI (4 AI)/4 DO, memory 400 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V8.4, older projects executable, cloud connection, MQTT in all LOGO! 8.4 basic devices	**6ED1052-1CC08-0BA2**
LOGO! 12/24RCE Logic module, display PS/I/O: 12/24 V DC/relay, 8 DI (4 AI)/4 DO, memory 400 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V8.4, older projects executable, cloud connection, MQTT in all LOGO! 8.4 basic devices	**6ED1052-1MD08-0BA2**
LOGO! 24RCE Logic module, display PS/I/O: 24 V AC/24 V DC/relay, 8 DI/4 DO, memory 400 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V8.4, older projects executable, cloud connection, MQTT in all LOGO! 8.4 basic devices	**6ED1052-1HB08-0BA2**

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Selection and ordering data (continued)

LOGO! 230RCE Logic module, display PS/I/O: 115 V/230 V/relay, 8 DI/4 DO, memory 400 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V8.4, older projects executable, cloud connection, MQTT in all LOGO! 8.4 basic devices	**6ED1052-1FB08-0BA2**
Accessories	
LOGO! SOFT Comfort V9 Single license for 1 installation, E-SW, SW and documentation, 6 languages, executable under Windows 10 (64-bit), Windows 11 (64-bit), Mac OS 11 Big Sur, 12.1, Monterey, 13.6 Ventura, 14.5 Sonoma, 15 Sequoia. Linux SUSE: tested SUSE Linux 15 (64-bit), Kylin Desktop V10 SP1	**6ED1058-0BA08-0YA3**
LOGO! ICL230 inrush current limiter Input: 100-240 V AC Output: 100-240 V AC/5 A	**6EP4683-6LB00-0AY0**
Accessories for LOGO! 9	
LOGO 9 TDE touch display 256 colors, 2 Ethernet ports, for LOGO! 9	**6ED1055-4MH08-0BA3**
LOGO! 9 TDE mounting accessories Spare parts for LOGO! TDE in case of loss or damage, power supply plug 3-pole, 2 mounting clips	**6ED1057-1DA00-0BA3**
Accessories for LOGO! 8	
LOGO! TD text display 6 lines, 3 background colors, 2 Ethernet ports, mounting accessories, for LOGO! 8	**6ED1055-4MH08-0BA1**
LOGO! Starter Kits	
LOGO! Starter Kit 12/24RCE V8.3 With LOGO! 12/24RCE, LOGO! Soft Comfort, WinCC Basic, power supply, screwdriver, in Systainer	**6ED1057-4BA01-0AA0**
LOGO! Starter Kit 230RCE V8.3 With LOGO! 230RCE, LOGO! Soft Comfort, WinCC Basic, screwdriver in Systainer	**6ED1057-4BA03-0AA0**
LOGO! TD Starter Kit 12/24 V8.3 With LOGO! TD, LOGO! 12/24RCEo, LOGO! Soft Comfort, power supply, WinCC Basic, screwdriver in Systainer	**6ED1057-4BA11-0AA0**
Front panel mounting kit	
SIPLUS LOGO! front panel mounting kit 4 MW For LOGO!+SIPLUS extreme with buttons, -40...+70 °C,	**6AG1057-1AA00-0AA3**
SIPLUS LOGO! front panel mounting kit 8 MW For LOGO!+SIPLUS extreme with buttons, -40...+70 °C,	**6AG1057-1AA00-0AA2**

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Technical specifications

Article number	6ED1052-1CC08-0BA2 LOGO! 24CE, 8DI(4AI)/4DO, 400 Blocks	6ED1052-1MD08-0BA2 LOGO!12/24RCE, 8DI(4AI)/4DO, 400 Blocks	6ED1052-1HB08-0BA2 LOGO! 24RCE, 8DI/4DO, 400 Blocks	6ED1052-1FB08-0BA2 LOGO!230RCE, 8DI/4DO, 400 Blocks
Display				
with display	Yes	Yes	Yes	Yes
Installation type/mounting				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes; 240 V DC
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes; 240 V AC
Time of day				
Time switching clocks				
• Number	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific
• Power reserve	480 h	480 h	480 h	480 h
Digital inputs				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
Digital outputs				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Output current				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
Relay outputs				
- Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
CSA approval	No; covered by UL cert	No; covered by UL cert	No; covered by UL cert	No; covered by UL cert
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes; in preparation	Yes; in preparation	Yes; in preparation	Yes; in preparation

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Technical specifications (continued)

Article number	6ED1052-1CC08-0BA2 LOGO! 24CE, 8DI(4AI)/4DO, 400 Blocks	6ED1052-1MD08-0BA2 LOGO!12/24RCE, 8DI(4AI)/4DO, 400 Blocks	6ED1052-1HB08-0BA2 LOGO! 24RCE, 8DI/4DO, 400 Blocks	6ED1052-1FB08-0BA2 LOGO!230RCE, 8DI/4DO, 400 Blocks
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C	55 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Dimensions				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	60 mm	60 mm	60 mm	60 mm

Article number	6ED1052-1CC08-0BA3 LOGO! 24CE, 8DI(4AI)/4DO, 800 Blocks	6ED1052-1MD08-0BA3 LOGO!12/24RCE, 8DI(4AI)/4DO, 800 Blocks	6ED1052-1HB08-0BA3 LOGO! 24RCE, 8DI/4DO, 800 Blocks	6ED1052-1FB08-0BA3 LOGO!230RCE, 8DI/4DO, 800 Blocks
Display				
with display	Yes	Yes	Yes	Yes
Installation type/mounting				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes; 240 V DC
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes; 240 V AC
Time of day				
Time switching clocks				
• Number	800; max. 800, function-specific	800; max. 800, function-specific	800; max. 800, function-specific	800; max. 800, function-specific
• Power reserve	480 h	480 h	480 h	480 h
Digital inputs				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
Digital outputs				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Relay outputs				
- Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B

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Technical specifications (continued)

Article number	6ED1052-1CC08-0BA3 LOGO! 24CE, 8DI(4AI)/4DO, 800 Blocks	6ED1052-1MD08-0BA3 LOGO!12/24RCE, 8DI(4AI)/4DO, 800 Blocks	6ED1052-1HB08-0BA3 LOGO! 24RCE, 8DI/4DO, 800 Blocks	6ED1052-1FB08-0BA3 LOGO!230RCE, 8DI/4DO, 800 Blocks
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	No; covered by UL cert
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C	55 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Dimensions				
Width	71.5 mm; 4 modular widths (MW)	71.5 mm; 4 modular widths (MW)	71.5 mm; 4 modular widths (MW)	71.5 mm; 4 modular widths (MW)
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm

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Overview



- Basic versions optimized for costs
- Interface for connecting expansion modules, up to 64 digital inputs, 60 digital outputs, 16 analog inputs and 16 analog outputs can be addressed
- With connection option for LOGO! TDE
- All basic devices with integrated web server for TD-based web pages and/or user-defined web pages
- Enclosure width 72 mm (4 MW)
- All basic units with Ethernet interface for communication with LOGO!, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard microSD cards for additional functions, e.g. copy program, data logging, copy protection

Selection and ordering data

LOGO! 9 logic module	
LOGO! 24CEo Logic module, without display, PS/I/O: 24 V/24 V/24 V trans., 8 DI (4 AI)/4 DO, memory 800 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V9, older projects executable, cloud connection, MQTT in all LOGO! 9 basic devices	**6ED1052-2CC08-0BA3**
LOGO! 12/24RCEO Logic module, without display, PS/I/O: 12/24 V DC/relay, 8 DI (4 AI)/4 DO, memory 800 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V9, older projects executable, cloud connection, MQTT in all LOGO! 9 basic devices	**6ED1052-2MD08-0BA3**
LOGO! 24RCEO (AC) Logic module, without display, PS/I/O: 24 V DC/24 V AC/relay, 8 DI/4 DO, memory 800 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V9, older projects executable, cloud connection, MQTT in all LOGO! 9 basic devices	**6ED1052-2HB08-0BA3**
LOGO! 230RCEo Logic module, without display, PS/I/O: 115 V/230 V/relay, 8 DI/4 DO, memory 800 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V9, older projects executable, cloud connection, MQTT in all LOGO! 9 basic devices	**6ED1052-2FB08-0BA3**
LOGO! 8 logic module	
LOGO! 24CEo Logic module, without display, PS/I/O: 24 V/24 V/24 V trans., 8 DI (4 AI)/4 DO, memory 400 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V8.4, older projects executable, cloud connection, MQTT in all LOGO! 8.4 basic devices	**6ED1052-2CC08-0BA2**
LOGO! 12/24RCEO Logic module, without display, PS/I/O: 12/24 V DC/relay, 8 DI (4 AI)/4 DO, memory 400 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V8.4, older projects executable, cloud connection, MQTT in all LOGO! 8.4 basic devices	**6ED1052-2MD08-0BA2**
LOGO! 24RCEO (AC) Logic module, without display, PS/I/O: 24 V DC/24 V AC/relay, 8 DI/4 DO, memory 400 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages, standard microSD card for LOGO! Soft Comfort from V8.4, older projects executable, cloud connection, MQTT in all LOGO! 8.4 basic devices	**6ED1052-2HB08-0BA2**
LOGO! 230RCEo Logic module, without display, PS/I/O: 115 V/230 V/relay, 8 DI/4 DO, memory 400 blocks, modularly expandable, Ethernet, integrated web server, data log, user-defined web pages Standard microSD card for LOGO! Soft Comfort from V8.4, older projects executable, cloud connection, MQTT in all LOGO! 8.4 basic devices	**6ED1052-2FB08-0BA2**
Accessories	

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Selection and ordering data (continued)

LOGO! SOFT Comfort V9 Single license for 1 installation, E-SW, SW and documentation, 6 languages, executable under Windows 10 (64-bit), Windows 11 (64-bit), Mac OS 11 Big Sur, 12.1, Monterey, 13.6 Ventura, 14.5 Sonoma, 15 Sequoia. Linux SUSE: tested SUSE Linux 15 (64-bit), Kylin Desktop V10 SP1	**6ED1058-0BA08-0YA3**
LOGO! TD text display 6 lines, 3 background colors, 2 Ethernet ports, mounting accessories for LOGO! 8	**6ED1055-4MH08-0BA1**
LOGO! ICL230 inrush current limiter Input: 100-240 V AC Output: 100-240 V AC/5 A	**6EP4683-6LB00-0AY0**
Accessories for LOGO! 9	
LOGO 9 TDE touch display 256 colors, 2 Ethernet ports, for LOGO! 9	**6ED1055-4MH08-0BA3**
LOGO! 9 TDE mounting accessories Spare parts for LOGO! TDE in case of loss or damage, power supply plug 3-pole, 2 mounting clips	**6ED1057-1DA00-0BA3**
Accessories for LOGO! 8	
LOGO! TD text display 6 lines, 3 background colors, 2 Ethernet ports, mounting accessories, for LOGO! 8	**6ED1055-4MH08-0BA1**
LOGO! Starter Kits	
LOGO! Starter Kit 12/24RCE V8.3 With LOGO! 12/24RCE, LOGO! Soft Comfort, WinCC Basic, power supply, screwdriver, in Systainer	**6ED1057-4BA01-0AA0**
LOGO! Starter Kit 230RCE V8.3 With LOGO! 230RCE, LOGO! Soft Comfort, WinCC Basic, screwdriver in Systainer	**6ED1057-4BA03-0AA0**
LOGO! TD Starter Kit 12/24 V8.3 With LOGO! TD, LOGO! 12/24RCEo, LOGO! Soft Comfort, power supply, WinCC Basic, screwdriver in Systainer	**6ED1057-4BA11-0AA0**

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Technical specifications

Article number	6ED1052-2CC08-0BA2 LOGO! 24CEo, 8DI(4AI)/4DO, 400 Blocks	6ED1052-2MD08-0BA2 LOGO!12/24RCEO, 8DI(4AI)/4DO,400 Blocks	6ED1052-2HB08-0BA2 LOGO! 24RCEO, 8DI/4DO, 400 Blocks	6ED1052-2FB08-0BA2 LOGO!230RCEo, 8DI/4DO,400 Blocks
Installation type/mounting				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes; 240 V DC
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes; 240 V AC
Time of day				
Time switching clocks				
• Number	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific
• Power reserve	480 h	480 h	480 h	480 h
Digital inputs				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
Digital outputs				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Output current				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
Relay outputs				
- Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
CSA approval	No; covered by UL cert	No; covered by UL cert	No; covered by UL cert	No; covered by UL cert
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes; in preparation	Yes; in preparation	Yes; in preparation	Yes; in preparation
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C	55 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)

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Technical specifications (continued)

Article number	6ED1052-2CC08-0BA2 LOGO! 24CEo, 8DI(4AI)/4DO, 400 Blocks	6ED1052-2MD08-0BA2 LOGO!12/24RCEO, 8DI(4AI)/4DO,400 Blocks	6ED1052-2HB08-0BA2 LOGO! 24RCEO, 8DI/4DO, 400 Blocks	6ED1052-2FB08-0BA2 LOGO!230RCEo, 8DI/4DO,400 Blocks
Dimensions				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm

Article number	6ED1052-2CC08-0BA3 LOGO! 24CEo, 8DI(4AI)/4DO, 800 Blocks	6ED1052-2MD08-0BA3 LOGO!12/24RCEO, 8DI(4AI)/4DO,800 Blocks	6ED1052-2HB08-0BA3 LOGO! 24RCEO, 8DI/4DO, 800 Blocks	6ED1052-2FB08-0BA3 LOGO!230RCEo, 8DI/4DO,800 Blocks
Display				
with display	No	No	No	No
Installation type/mounting				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on DIN rail 25 mm, 4 module spaces wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes; 240 V DC
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes; 240 V AC
Time of day				
Time switching clocks				
• Number	800; max. 800, function-specific	800; max. 800, function-specific	800; max. 800, function-specific	800; max. 800, function-specific
• Power reserve	480 h	480 h	480 h	480 h
Digital inputs				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
Digital outputs				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Output current				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
Relay outputs				
- Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B

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Technical specifications (continued)

Article number	6ED1052-2CC08-0BA3 LOGO! 24CEo, 8DI(4AI)/4DO, 800 Blocks	6ED1052-2MD08-0BA3 LOGO!12/24RCEO, 8DI(4AI)/4DO,800 Blocks	6ED1052-2HB08-0BA3 LOGO! 24RCEO, 8DI/4DO, 800 Blocks	6ED1052-2FB08-0BA3 LOGO!230RCEo, 8DI/4DO,800 Blocks
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	No; covered by UL cert
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C	55 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Dimensions				
Width	71.5 mm; 4 modular widths (MW)	71.5 mm; 4 modular widths (MW)	71.5 mm; 4 modular widths (MW)	71.5 mm; 4 modular widths (MW)
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm

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Overview



- Expansion modules for connection to LOGO! Modular
- With digital inputs and outputs, analog inputs, or analog outputs

Selection and ordering data

LOGO! 9 expansion modules	
LOGO! DM8 12/24R Expansion module, PS/I/O: 12, 24 V/12 V/24 V/relay, 2 MW, 4 DI/4 DO for LOGO! 9	**6ED1055-1MB00-0BA3**
LOGO! DM8 230R Expansion module, PS/I/O: 230 V/230 V/relay, 2 MW, 4 DI/4 DO for LOGO! 9	**6ED1055-1FB00-0BA3**
LOGO! AM4 Expansion module, PS: 24 V DC, 2 AI, 0-10 V or 0/4-20 mA and 2 AO, 0-10 V, 0/4-20 mA for LOGO! 8	**6ED1055-1MF00-0BA3**
LOGO! 8 expansion modules	
LOGO! DM8 24 Expansion module, PS/I/O: 24 V/24 V/trans., 4 DI/4 DO for LOGO! 8	**6ED1055-1CB00-0BA2**
LOGO! DM16 24 Expansion module, PS/I/O: 24 V DC/24 V DC/trans., 8 DI/8 DO, 4 MW for LOGO! 8	**6ED1055-1CB10-0BA2**
LOGO! DM8 12/24R Expansion module, PS/I/O: 12, 24 V/12 V/24 V/relay, 2 MW, 4 DI/4 DO for LOGO! 8	**6ED1055-1MB00-0BA2**
LOGO! DM8 24R Expansion module, PS/I/O: 24 V/24 V/relay, 2 MW 4 DI/4 DO, AC/DC/NPN input for LOGO! 8	**6ED1055-1HB00-0BA2**
LOGO! DM16 24R Expansion module, PS/I/O: 24 V DC/24 V DC/relay, 8 DI/8 DO, 4 MW for LOGO! 8	**6ED1055-1NB10-0BA2**
LOGO! DM8 230R Expansion module, PS/I/O: 230 V/230 V/relay, 2 MW, 4 DI/4 DO for LOGO! 8	**6ED1055-1FB00-0BA2**
LOGO! DM16 230R Expansion module, PS/I/O: 230 V/230 V/relay, 4 MW, 8 DI/8 DO for LOGO! 8	**6ED1055-1FB10-0BA2**
LOGO! AM2 Expansion module, PS/: 12/24 V DC, 2 AI, 0-10 V or 0/4-20 mA for LOGO! 8	**6ED1055-1MA00-0BA2**
LOGO! AM2 RTD Expansion module, PS: 12/24 V DC, 2 AI -50...+200 °C Pt100/1000 for LOGO! 8	**6ED1055-1MD00-0BA2**
LOGO! AM2 AQ Expansion module, PS: 24 V DC, 2 AO, 0-10 V, 0/4-20 mA for LOGO! 8	**6ED1055-1MM00-0BA2**
Accessories	
LOGO! SOFT Comfort V9 Single license for 1 installation, E-SW, SW and documentation, 6 languages, executable under Windows 10 (64-bit), Windows 11 (64-bit), Mac OS 11 Big Sur, 12.1, Monterey, 13.6 Ventura, 14.5 Sonoma, 15 Sequoia. Linux SUSE: tested SUSE Linux 15 (64-bit), Kylin Desktop V10 SP1	**6ED1058-0BA08-0YA3**
LOGO! ICL230 inrush current limiter Input: 100-240 V AC Output: 100-240 V AC/5 A	**6EP4683-6LB00-0AY0**

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Technical specifications

Article number	6ED1055-1CB00-0BA2 LOGO! DM8 24 Exp. mod., 4DI/4DO	6ED1055-1HB00-0BA2 LOGO! DM8 24R Exp. mod. 2 MW, 4DI/4DO	6ED1055-1MB00-0BA2 LOGO! DM8 12/24R Exp. mod. 2 MW, 4DI/DO	6ED1055-1FB00-0BA2 LOGO! DM8 230R Exp. mod. 2 MW, 4DI/4DO
Installation type/mounting				
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC			Yes	
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
Rated value (AC)				
• 24 V AC		Yes		
• 115 V AC				Yes
• 230 V AC				Yes
Digital inputs				
Number of digital inputs	4	4	4	4
Input voltage				
• Type of input voltage	DC	AC/DC	DC	AC/DC
• for signal "0"	< 5 V DC	< 5 V AC/DC	< 5 V DC	< 40 V AC, < 30 V DC
• for signal "1"	> 12 V DC	> 12 V AC/DC	> 8.5 V	> 79 V AC, > 79 V DC
Input current				
• for signal "0", max. (permissible quiescent current)	0.88 mA	1.1 mA	0.88 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	2.1 mA	2.63 mA	1.5 mA	0.13 mA
Input delay (for rated value of input voltage)				
- for standard inputs				
- at "0" to "1", max.	1.5 ms	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	15 ms	1.5 ms	75 ms
Digital outputs				
Number of digital outputs	4	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes	No	No	No
Controlling a digital input		Yes	Yes	Yes
Switching capacity of the outputs				
• on lamp load, max.		1 000 W	1 000 W	1 000 W; 500 W at 115V AC
Parallel switching of two outputs				
• for uprating	No	No	No	No
Switching frequency				
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz
Relay outputs				
- Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		5 A	5 A	5 A
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes	Yes	Yes	Yes
Degree and class of protection				
IP degree of protection	IP20	IP20	IP20	IP20

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Technical specifications (continued)

Article number	6ED1055-1CB00-0BA2 LOGO! DM8 24 Exp. mod., 4DI/4DO	6ED1055-1HB00-0BA2 LOGO! DM8 24R Exp. mod. 2 MW, 4DI/4DO	6ED1055-1MB00-0BA2 LOGO! DM8 12/24R Exp. mod. 2 MW, 4DI/DO	6ED1055-1FB00-0BA2 LOGO! DM8 230R Exp. mod. 2 MW, 4DI/4DO
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes		Yes
Marine approval	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C	55 °C
Dimensions				
Width	35.5 mm	35.5 mm	35.5 mm	35.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm

Article number	6ED1055-1CB10-0BA2 LOGO! DM16 24 Exp. mod., 4 MW, 8DI/8DO	6ED1055-1NB10-0BA2 LOGO! DM16 24R Exp. mod. 4 MW, 8DI/8DO	6ED1055-1FB10-0BA2 LOGO! DM16 230R Exp. mod. 4 MW, 8DI/8DO
Installation type/mounting			
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	
• 115 V DC			Yes
• 230 V DC			Yes
Rated value (AC)			
• 24 V AC		No	
• 115 V AC			Yes
• 230 V AC			Yes
Digital inputs			
Number of digital inputs	8	8	8
Input voltage			
• Type of input voltage	DC	DC	AC/DC
• for signal "0"	< 5 V DC	< 5 V DC	< 40 V AC, < 30 V DC
• for signal "1"	> 12 V DC	> 12 V DC	> 79 V AC, > 79 V DC
Input current			
• for signal "0", max. (permissible quiescent current)	0.85 mA	0.85 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	2 mA	2 mA	0.13 mA
Input delay (for rated value of input voltage)			
- for standard inputs			
- at "0" to "1", max.	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	1.5 ms	75 ms

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Technical specifications (continued)

Article number	6ED1055-1CB10-0BA2 LOGO! DM16 24 Exp. mod., 4 MW, 8DI/8DO	6ED1055-1NB10-0BA2 LOGO! DM16 24R Exp. mod. 4 MW, 8DI/8DO	6ED1055-1FB10-0BA2 LOGO! DM16 230R Exp. mod. 4 MW, 8DI/8DO
Digital outputs			
Number of digital outputs	8	8; Relays	8; Relays
Short-circuit protection	Yes	No	No
Controlling a digital input		Yes	Yes
Switching capacity of the outputs			
• on lamp load, max.		1 000 W	1 000 W; 500 W at 115V AC
Parallel switching of two outputs			
• for uprating	No	No	No
Switching frequency			
• with resistive load, max.	10 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz
Relay outputs			
- Switching capacity of contacts			
- with inductive load, max.		3 A	3 A
- with resistive load, max.		5 A	5 A
EMC			
Emission of radio interference acc. to EN 55 011			
• Limit class B, for use in residential areas	Yes	Yes	Yes
Degree and class of protection			
IP degree of protection	IP20	IP20	IP20
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C
Dimensions			
Width	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm

Article number	6ED1055-1MA00-0BA2 LOGO! AM2 Exp. mod., 12/24V, 2AI,	6ED1055-1MD00-0BA2 LOGO! AM2 RDT, 2AI, -50..+200DECR/C
Installation type/mounting		
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
Supply voltage		
Rated value (DC)		
• 12 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
• 24 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC

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Technical specifications (continued)

Article number	6ED1055-1MA00-0BA2 LOGO! AM2 Exp. mod., 12/24V, 2AI,	6ED1055-1MD00-0BA2 LOGO! AM2 RDT, 2AI, -50..+200DECR/C
Analog inputs		
Number of analog inputs	2	2; 2 or 3 wire connection
Input ranges		
• Voltage	Yes	No
• Current	Yes	No
• Resistance thermometer	No	Yes; For PT100/PT1000 sensors
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	No
Input ranges (rated values), currents		
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA	No
Input ranges (rated values), resistance thermometer		
• Pt 100	No	Yes
EMC		
Emission of radio interference acc. to EN 55 011		
• Limit class B, for use in residential areas	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
FM approval	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes
according to VDE 0631	Yes	
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C
Dimensions		
Width	35.5 mm	35.5 mm
Height	90 mm	90 mm
Depth	58 mm	58 mm

Article number	6ED1055-1MM00-0BA2 LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20mA
Installation type/mounting	
Mounting	on 35 mm DIN rail, 2 spacing units wide
Supply voltage	
Rated value (DC)	24 V
Analog outputs	
Number of analog outputs	2
Output ranges, voltage	
• 0 to 10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
• Limit class B, for use in residential areas	Yes
Degree and class of protection	
IP degree of protection	IP20

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Technical specifications (continued)

Article number	6ED1055-1MM00-0BA2 LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20mA
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
FM approval	Yes
developed in accordance with IEC 61131	Yes
according to VDE 0631	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C; No condensation
• max.	55 °C
Dimensions	
Width	35.5 mm
Height	90 mm
Depth	58 mm

Article number	6ED1055-1MB00-0BA3 LOGO! DM8 12/24R Exp. mod. 2 MW, 4DI/DO	6ED1055-1FB00-0BA3 LOGO! DM8 230R Exp. mod. 2 MW, 4DI/4DO
Installation type/mounting		
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
Supply voltage		
Rated value (DC)		
• 12 V DC	Yes	
• 24 V DC	Yes	
• 115 V DC		Yes
• 230 V DC		Yes
Rated value (AC)		
• 115 V AC		Yes
• 230 V AC		Yes
Digital inputs		
Number of digital inputs	4	4
Input voltage		
• Type of input voltage	DC	AC/DC
• for signal "0"	< 5 V DC	< 40 V AC, < 30 V DC
• for signal "1"	> 8.5 V	> 79 V AC, > 79 V DC
Input current		
• for signal "0", max. (permissible quiescent current)	0.88 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	1.5 mA	0.13 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- at "0" to "1", max.	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	75 ms

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Technical specifications (continued)

Article number	6ED1055-1MB00-0BA3 LOGO! DM8 12/24R Exp. mod. 2 MW, 4DI/DO	6ED1055-1FB00-0BA3 LOGO! DM8 230R Exp. mod. 2 MW, 4DI/4DO
Digital outputs		
Number of digital outputs	4; Relays	4
Short-circuit protection	No	No
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	1 000 W	1 000 W; 500 W at 115V AC
Parallel switching of two outputs		
• for uprating	No	No
Switching frequency		
• with resistive load, max.	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• mechanical, max.	10 Hz	10 Hz
Relay outputs		
- Switching capacity of contacts		
- with inductive load, max.	3 A	3 A
- with resistive load, max.	5 A	5 A
EMC		
Emission of radio interference acc. to EN 55 011		
• Limit class B, for use in residential areas	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
FM approval	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes
according to VDE 0631		Yes
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Dimensions		
Width	35.5 mm; 2 modular widths (MW)	35.5 mm; 2 modular widths (MW)
Height	90 mm	90 mm
Depth	58 mm	58 mm

Article number	6ED1055-1MF00-0BA3 LOGO! AM4 AI AQ Exp. mod., 24V, 2AI, 2A
Installation type/mounting	
Mounting	on 35 mm DIN rail, 4 spacing units wide
Supply voltage	
Rated value (DC)	24 V
• 24 V DC	Yes

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Technical specifications (continued)

Article number	6ED1055-1MF00-0BA3 LOGO! AM4 AI AQ Exp. mod., 24V, 2AI, 2A
Analog inputs	
Number of analog inputs	2; 0 ... 10 V, 0/4 ... 20 mA
Input ranges	
• Voltage	Yes; 0 to 10V
• Current	Yes; From 0/4 to 20 mA
Input ranges (rated values), voltages	
• 0 to +10 V	Yes; 0 to 10V
Input ranges (rated values), currents	
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA
Input ranges (rated values), resistance thermometer	
• Pt 100	No
Analog outputs	
Number of analog outputs	2
Output ranges, voltage	
• 0 to 10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
• Limit class B, for use in residential areas	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
developed in accordance with IEC 61131	Yes
according to VDE 0631	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C; No condensation
• max.	55 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	1 080 to 795 hPa, corresponds to an elevation of -1 000 m to 2 000 m
Dimensions	
Width	35.5 mm; 2 modular widths (MW)
Height	90 mm
Depth	58 mm

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Overview



- The space-saving basic versions
- Interface for connecting expansion modules, up to 24 digital inputs, 20 (16) digital outputs, 8 analog inputs and 8 (2) analog outputs can be addressed
- All basic devices with integrated web server for TD-based web pages and/or user-defined web pages
- Enclosure width 72 mm (4 MW)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard microSD cards

Note:

SIPLUS LOGO! 6/7 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS LOGO! 8 logic module Extended temperature range and exposure to environmental substances	
SIPLUS LOGO! 24CE	**6AG1052-1CC08-7BA2**
SIPLUS LOGO! 230RCE	**6AG1052-1FB08-7BA2**
SIPLUS LOGO! 24RCE	**6AG1052-1HB08-7BA1**
SIPLUS LOGO! 24RCE	**6AG1052-1HB08-7BA2**
SIPLUS LOGO! 12/24RCE	**6AG1052-1MD08-7BA2**
Accessories	
SIPLUS LOGO! TDE (Extended temperature range -25 ... +60 °C (start-up -20 °C) and exposure to environmental substances) 6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply	**6AG1055-4MH08-2BA1**
LOGO!Soft Comfort V8 For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	**6ED1058-0BA08-0YA1**
Front panel mounting kit Width 8 MW, with keys	**6AG1057-1AA00-0AA2**

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Technical specifications

Article number	6AG1052-1CC08-7BA2 SIPLUS LOGO! 24CE	6AG1052-1MD08-7BA2 SIPLUS LOGO! 12/24RCE	6AG1052-1HB08-7BA2 SIPLUS LOGO! 24RCE	6AG1052-1FB08-7BA2 SIPLUS LOGO! 230RCE
Display				
with display	Yes; The legibility and response time of the display may be reduced or lengthened at temperatures outside 0 ... +55 °C. These effects are self-reversing on return to the normal temperature range of 0 ... +55 °C.	Yes; The legibility and response time of the display may be reduced or lengthened at temperatures outside 0 ... +55 °C. These effects are self-reversing on return to the normal temperature range of 0 ... +55 °C.	Yes; The legibility and response time of the display may be reduced or lengthened at temperatures outside 0 ... +55 °C. These effects are self-reversing on return to the normal temperature range of 0 ... +55 °C.	Yes; The legibility and response time of the display may be reduced or lengthened at temperatures outside 0 ... +55 °C. These effects are self-reversing on return to the normal temperature range of 0 ... +55 °C.
Installation type/mounting				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes; 240 V DC
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes; 240 V AC
Time of day				
Time switching clocks				
• Number	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific
• Power reserve	480 h	480 h	480 h	480 h
Digital inputs				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
Digital outputs				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Output current				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
Relay outputs				
- Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B

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Technical specifications (continued)

Article number	6AG1052-1CC08-7BA2 SIPLUS LOGO! 24CE	6AG1052-1MD08-7BA2 SIPLUS LOGO! 12/24RCE	6AG1052-1HB08-7BA2 SIPLUS LOGO! 24RCE	6AG1052-1FB08-7BA2 SIPLUS LOGO! 230RCE
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C
• max.	60 °C; = Tmax	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	60 °C; Tmax; Tmax > +55 °C max. load 1 A per relay
• At cold restart, min.	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *

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Technical specifications (continued)

Article number	6AG1052-1CC08-7BA2 SIPLUS LOGO! 24CE	6AG1052-1MD08-7BA2 SIPLUS LOGO! 12/24RCE	6AG1052-1HB08-7BA2 SIPLUS LOGO! 24RCE	6AG1052-1FB08-7BA2 SIPLUS LOGO! 230RCE
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	60 mm	60 mm	60 mm	60 mm

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Overview



- Basic versions optimized for costs
- Interface for connecting expansion modules, up to 24 digital inputs, 16 (20) digital outputs, 8 analog inputs and 2 (8) analog outputs can be addressed
- With connection option for LOGO! TD text display
- All basic devices with integrated web server for TD-based web pages and/or user-defined web pages
- Enclosure width 72 mm (4 MW)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controllers, SIMATIC Panel and PC
- Use of standard microSD cards

Note:

SIPLUS LOGO! 6 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS LOGO! 8 logic module	
Extended temperature range and exposure to environmental substances	
SIPLUS LOGO! 24CEO	**6AG1052-2CC08-7BA2**
SIPLUS LOGO! 230RCEO	**6AG1052-2FB08-7BA2**
SIPLUS LOGO! 24RCEO (AC)	**6AG1052-2HB08-7BA2**
SIPLUS LOGO! 12/24RCEO	**6AG1052-2MD08-7BA2**
Accessories	
SIPLUS LOGO! TDE (Extended temperature range -25 ... +60 °C (start-up -20 °C) and exposure to environmental substances) 6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply	**6AG1055-4MH08-2BA1**
LOGO!Soft Comfort V8 For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	**6ED1058-0BA08-0YA1**
Front panel mounting kit Width 8 MW, with keys	**6AG1057-1AA00-0AA2**

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Technical specifications

Article number	6AG1052-2CC08-7BA2 SIPLUS LOGO! 24CEO	6AG1052-2FB08-7BA2 SIPLUS LOGO! 230RCEO	6AG1052-2HB08-7BA2 SIPLUS LOGO! 24RCEO (AC)	6AG1052-2MD08-7BA2 SIPLUS LOGO! 12/24RCEO
Display				
with display	No	No	No	No
Installation type/mounting				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC				Yes
• 24 V DC	Yes		Yes	Yes
• 115 V DC		Yes		
• 230 V DC		Yes; 240 V DC		
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC		Yes		
• 230 V AC		Yes; 240 V AC		
Time of day				
Time switching clocks				
• Number	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific
• Power reserve	480 h	480 h	480 h	480 h
Digital inputs				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8	8; Of which 4 can be used in analog mode (0 to 10 V)
Digital outputs				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Output current				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A			10 A
Relay outputs				
- Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B

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Technical specifications (continued)

Article number	6AG1052-2CC08-7BA2 SIPLUS LOGO! 24CEO	6AG1052-2FB08-7BA2 SIPLUS LOGO! 230RCEO	6AG1052-2HB08-7BA2 SIPLUS LOGO! 24RCEO (AC)	6AG1052-2MD08-7BA2 SIPLUS LOGO! 12/24RCEO
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	2 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *

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Technical specifications (continued)

Article number	6AG1052-2CC08-7BA2 SIPLUS LOGO! 24CEO	6AG1052-2FB08-7BA2 SIPLUS LOGO! 230RCEO	6AG1052-2HB08-7BA2 SIPLUS LOGO! 24RCEO (AC)	6AG1052-2MD08-7BA2 SIPLUS LOGO! 12/24RCEO
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	60 mm	58 mm	58 mm

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Overview



- Expansion modules for connection to LOGO! Modular
- With digital inputs and outputs, analog inputs, or analog outputs

Note:

SIPLUS LOGO! 6 versions are not compatible with SIPLUS LOGO! 8.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS LOGO! 8 expansion modules	
SIPLUS LOGO! DM8 24 24 V DC supply voltage, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A Extended temperature range and exposure to environmental substances	**6AG1055-1CB00-7BA2**
SIPLUS LOGO! DM8 230R 115...230 V AC/DC supply voltage, 4 digital inputs 115...230 V AC/DC, 4 relay outputs 5 A Extended temperature range and exposure to environmental substances	**6AG1055-1FB00-7BA2**
SIPLUS LOGO! DM8 24R 24 V AC/DC supply voltage, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A Extended temperature range and exposure to environmental substances	**6AG1055-1HB00-7BA2**
SIPLUS LOGO! AM2 12...24 V DC supply voltage, 2 analog inputs 0 to 10 V or 0 to 20 mA, 10-bit resolution Extended temperature range and exposure to environmental substances	**6AG1055-1MA00-7BA2**
SIPLUS LOGO! DM8 12/24R 12...24 V DC supply voltage, 4 digital inputs 12...24 V DC, 4 relay outputs 5 A Extended temperature range and exposure to environmental substances	**6AG1055-1MB00-7BA2**
LOGO! AM2 RTD 12...24 V DC supply voltage, 2 analog inputs Pt100, temperature range -50 °C to 200 °C Extended temperature range and exposure to environmental substances	**6AG1055-1MD00-7BA2**
SIPLUS LOGO! AM2 AQ 24 V DC supply voltage, 2 analog outputs 0 to 10 V, 0/4 to 20 mA Extended temperature range and exposure to environmental substances	**6AG1055-1MM00-7BA2**
SIPLUS LOGO! DM16 24R 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 relay outputs 5 A Extended temperature range and exposure to environmental substances	**6AG1055-1NB10-7BA2**
Accessories	
LOGO!Soft Comfort V8 For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	**6ED1058-0BA08-0YA1**
Front panel mounting kit Width 8 MW, with keys	**6AG1057-1AA00-0AA2**

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Technical specifications

Article number	6AG1055-1FB00-7BA2 SIPLUS LOGO! DM8 230R V8	6AG1055-1NB10-7BA2 SIPLUS LOGO! DM16 24R V8
Installation type/mounting		
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage		
Rated value (DC)		
• 24 V DC		Yes
• 115 V DC	Yes	
• 230 V DC	Yes	
Rated value (AC)		
• 24 V AC		No
• 115 V AC	Yes	
• 230 V AC	Yes	
Digital inputs		
Number of digital inputs	4	8
Input voltage		
• Type of input voltage	AC/DC	DC
• for signal "0"	< 40 V AC, < 30 V DC	< 5 V DC
• for signal "1"	> 79 V AC, > 79 V DC	> 12 V DC
Input current		
• for signal "0", max. (permissible quiescent current)	0.06 mA; 0.05 mA with AC, 0.06 mA with DC	0.85 mA
• for signal "1", typ.	0.37 mA	2 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- at "0" to "1", max.	40 ms	1.5 ms
- at "1" to "0", max.	75 ms	1.5 ms
Digital outputs		
Number of digital outputs	4; Relays	8; Relays
Short-circuit protection	No	No
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	1 000 W; 500 W at 115V AC	1 000 W
Parallel switching of two outputs		
• for uprating	No	No
Switching frequency		
• with resistive load, max.	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• mechanical, max.	10 Hz	10 Hz
Relay outputs		
- Switching capacity of contacts		
- with inductive load, max.	3 A	3 A
- with resistive load, max.	5 A	5 A
EMC		
Emission of radio interference acc. to EN 55 011		
• Limit class B, for use in residential areas	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20

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Technical specifications (continued)

Article number	6AG1055-1FB00-7BA2 SIPLUS LOGO! DM8 230R V8	6AG1055-1NB10-7BA2 SIPLUS LOGO! DM16 24R V8
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions		
Width	35.5 mm	71.5 mm
Height	90 mm	90 mm
Depth	58 mm	58 mm

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Technical specifications (continued)

Article number	6AG1055-1CB00-7BA2 SIPLUS LOGO! DM8 24 V8	6AG1055-1HB00-7BA2 SIPLUS LOGO! DM8 24R V8	6AG1055-1MB00-7BA2 SIPLUS LOGO! DM8 12/24R V8
Installation type/mounting			
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
Supply voltage			
Rated value (DC)			
• 12 V DC			Yes
• 24 V DC	Yes	Yes	Yes
Rated value (AC)			
• 24 V AC		Yes	
Digital inputs			
Number of digital inputs	4	4	4
Input voltage			
• Type of input voltage	DC	AC/DC	DC
• for signal "0"	< 5 V DC	< 5 V AC/DC	< 5 V DC
• for signal "1"	> 12 V DC	> 12 V AC/DC	> 8.5 V
Input current			
• for signal "0", max. (permissible quiescent current)	0.88 mA	1.1 mA	0.88 mA
• for signal "1", typ.	2.1 mA	2.63 mA	1.5 mA
Input delay (for rated value of input voltage)			
- for standard inputs			
- at "0" to "1", max.	1.5 ms	1.5 ms	1.5 ms
- at "1" to "0", max.	1.5 ms	15 ms	1.5 ms
Digital outputs			
Number of digital outputs	4	4; Relays	4; Relays
Short-circuit protection	Yes	No	No
Controlling a digital input		Yes	Yes
Switching capacity of the outputs			
• on lamp load, max.		1 000 W	1 000 W
Parallel switching of two outputs			
• for uprating	No	No	No
Switching frequency			
• with resistive load, max.	10 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz
Relay outputs			
- Switching capacity of contacts			
- with inductive load, max.		3 A	3 A
- with resistive load, max.		5 A	5 A
EMC			
Emission of radio interference acc. to EN 55 011			
• Limit class B, for use in residential areas	Yes	Yes	Yes
Degree and class of protection			
IP degree of protection	IP20	IP20	IP20

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Technical specifications (continued)

Article number	6AG1055-1CB00-7BA2 SIPLUS LOGO! DM8 24 V8	6AG1055-1HB00-7BA2 SIPLUS LOGO! DM8 24R V8	6AG1055-1MB00-7BA2 SIPLUS LOGO! DM8 12/24R V8
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *

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Technical specifications (continued)

Article number	6AG1055-1CB00-7BA2 SIPLUS LOGO! DM8 24 V8	6AG1055-1HB00-7BA2 SIPLUS LOGO! DM8 24R V8	6AG1055-1MB00-7BA2 SIPLUS LOGO! DM8 12/24R V8
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions			
Width	35.5 mm	35.5 mm	35.5 mm
Height	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm

Article number	6AG1055-1MA00-7BA2 SIPLUS LOGO! AM2 V8	6AG1055-1MD00-7BA2 SIPLUS LOGO! AM2 RTD
Installation type/mounting		
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
Supply voltage		
Rated value (DC)		
• 12 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
• 24 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
Analog inputs		
Number of analog inputs	2	2; 2 or 3 wire connection
Input ranges		
• Voltage	Yes	No
• Current	Yes	No
• Resistance thermometer	No	Yes; For PT100/PT1000 sensors
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	No
Input ranges (rated values), currents		
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA	No
Input ranges (rated values), resistance thermometer		
• Pt 100	No	Yes
EMC		
Emission of radio interference acc. to EN 55 011		
• Limit class B, for use in residential areas	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20

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Technical specifications (continued)

Article number	6AG1055-1MA00-7BA2 SIPLUS LOGO! AM2 V8	6AG1055-1MD00-7BA2 SIPLUS LOGO! AM2 RTD
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax	70 °C; = Tmax
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions		
Width	35.5 mm	35.5 mm
Height	90 mm	90 mm
Depth	58 mm	58 mm

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Technical specifications (continued)

Article number	6AG1055-1MM00-7BA2 SIPLUS LOGO! AM2 AQ V8
Installation type/mounting	
Mounting	on 35 mm DIN rail, 2 spacing units wide
Supply voltage	
Rated value (DC)	24 V
Analog outputs	
Number of analog outputs	2
Output ranges, voltage	
• 0 to 10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
• Limit class B, for use in residential areas	Yes
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *

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Technical specifications (continued)

Article number	6AG1055-1MM00-7BA2 SIPLUS LOGO! AM2 AQ V8
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	35.5 mm
Height	90 mm
Depth	58 mm

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Overview



- Communications modules for connecting LOGO! Modular to different bus systems.

Note on compatibility:

Communications module	Can be used with:
LOGO! CMK2000 communications module	LOGO! 9
LOGO! CIM	LOGO! 9
LOGO! CSM 12/24	LOGO! 7/8
LOGO! CMR2040	LOGO! 8

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Overview



- Expansion module for LOGO! 9 basic versions
- For integrating LOGO! 9 in KNX installations
- With 24 digital inputs, 20 digital outputs as well as 8 analog inputs and outputs for processing process signals via KNX

Selection and ordering data

LOGO! CMK2000 Communications module to integrate the LOGO! 9 in the building system bus KNX; connection 24 V DC 0.04 A 1 RJ45 port for Ethernet 50 communication objects time synchronization configuration/diagnostics via web interface	**6BK1700-0BA20-0AA0**

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Technical specifications

Article number	6BK1700-0BA20-0AA0 LOGO! CMK2000
General information	
Firmware version	
• FW update possible	Yes
Installation type/mounting	
Mounting	on 35 mm DIN rail, 4 spacing units wide
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, max.	0.04 A
Storage	
Flash	Yes
Time of day	
Clock synchronization	
• supported	Yes
Interfaces	
Number of industrial Ethernet interfaces	1; Ethernet, 1 port, RJ45
Number of other interfaces	1; EIB/KNX
Transmission rate, max.	100 Mbit/s over Ethernet, 9 600 bit/s over KNX
Design of plug-in connection	KNX terminal 0.6 mm² - 1.0 mm²
Protocols	
EIB/KNX	Yes
Web server	
• supported	Yes
Communication functions	
S7 basic communication	
• supported	No
LOGO! communication	
• supported	Yes
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
• Limit class B, for use in residential areas	Yes; In accordance with EN 61000-6-3
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	No
KC approval	Yes
EAC (formerly Gost-R)	Yes
according to VDE 0631	No
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Relative humidity	
• Operation, max.	95 %
Connection method	
Design of electrical connection for supply voltage	2 screw-type terminals: L+, M 0.5 mm² - 2.5 mm² Screw-type terminal: FE 0.5 mm² ... 6.0 mm²

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Technical specifications (continued)

Article number	6BK1700-0BA20-0AA0 LOGO! CMK2000
Dimensions	
Width	71.5 mm; 4TE
Height	90 mm
Depth	58.5 mm
Weights	
Weight, approx.	0.14 kg

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Overview



- Expansion module for LOGO! 9 basic versions
- For transmitting and receiving text messages and transmission of data from LOGO! 9 basic devices to the AWS Cloud
- The built-in ModbusRTU interface supports ModbusRTU participants with RS232, RS485 and RS422 interface
- With an integrated GNSS receiver for tracking and transmitting the position

Note

For wireless operation, the following additional components are required (not included in the scope of scope of supply of LOGO! CIM):

- Wireless engine
- Antennas
- Antenna connecting cable between wireless engine and antenna port (the corresponding products are recommended in the documentation)
- SIM card with activated data transmission

Selection and ordering data

LOGO! CIM Communication Interface Module For LOGO! 9 Modbus RTU interface (RS232/485) 4-port switch; without 4G/LTE/GPS engine; without antennas; web configurator	**6ED1055-5MC08-0BA3**

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Technical specifications

Article number	6ED1055-5MC08-0BA3 CIM
General information	
Firmware version	V1.1.2
• FW update possible	Yes
Installation type/mounting	
Mounting	on 35 mm DIN rail, 4 spacing units wide
Supply voltage	
Rated value (DC)	24 V; 12/24 V DC
• 12 V DC	Yes
• 24 V DC	Yes
Rated value (AC)	
• 24 V AC	No
Input current	
Current consumption, max.	1 A
Storage	
Flash	Yes; 2 MB NOR flash
Time of day	
Clock synchronization	
• supported	Yes
Interfaces	
Number of industrial Ethernet interfaces	4; 4 ports (switch)
Number of other interfaces	1; mini PCIe interface for 4G module
Protocols	
Web server	
• supported	Yes
Communication functions	
S7 basic communication	
• supported	Yes
LOGO! communication	
• supported	Yes
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
• Limit class B, for use in residential areas	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
developed in accordance with IEC 61131	Yes
according to VDE 0631	No
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	55 °C
Relative humidity	
• Operation, max.	95 %; no condensation

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Technical specifications (continued)

Article number	6ED1055-5MC08-0BA3 CIM
Dimensions	
Width	71.5 mm
Height	90 mm
Depth	58.5 mm; without antenna sockets
Weights	
Weight, approx.	200 g

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Overview



The module is used to connect a LOGO! and up to three other nodes to an Industrial Ethernet network with 10/100 Mbps in an electrical linear, tree or star topology.

The main features of the LOGO! CSM are:

- Unmanaged 4-port switch, of which one port is on the front for easy diagnostics access
- Power supply: 12/24 V DC
- Problem-free connection using four RJ45 standard connectors
- Space-saving, optimized for connection to LOGO!
- Low-cost solution for implementing small, local Ethernet networks
- Stand-alone use for networking any Ethernet devices

Selection and ordering data

	Article No.
LOGO! CSM compact switch module Unmanaged switch for connection of one LOGO! and up to three further stations on Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; LED diagnostics, LOGO! module	
• **LOGO! CSM12/24** external 12 V DC or 24 V DC power supply, for LOGO! ... 0BA7/... 0BA8	**6GK7177-1MA20-0AA0**

Accessories

	Article No.
IE TP cord RJ45/RJ45 TP cable 4 x 2 with 2 RJ45 plugs	
• 0.5 m	**6XV1870-3QE50**
• 1 m	**6XV1870-3QH10**
• 2 m	**6XV1870-3QH20**
• 6 m	**6XV1870-3QH60**
• 10 m	**6XV1870-3QN10**
IE FC RJ45 outlet For connecting Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more	**6GK1901-1FC00-0AA0**

Technical specifications

Article number	6GK7177-1MA20-0AA0
product type designation	
product brand name	LOGO!
product type designation	CSM 12/24
Technical Product Detail Page	https://i.siemens.com/1P6GK7177-1MA20-0AA0
transfer rate	
transfer rate	10 Mbit/s, 100 Mbit/s
interfaces for communication integrated	
number of electrical connections	
• for network components or terminal equipment	4
number of 100 Mbit/s SC ports	
• for multimode	0
interfaces other	
number of electrical connections	
• for power supply	1
type of electrical connection	
• for power supply	3-pole terminal block
supply voltage, current consumption, power loss	
type of voltage 1 of the supply voltage	DC
• supply voltage 1 rated value	24 V
• power loss [W] 1 rated value	1.5 W
• supply voltage 1 voltage range	10.2 ... 30.2
• consumed current 1 maximum	0.15 A
• type of electrical connection 1 for power supply	3-pole terminal block
• product component 1 fusing at power supply input	Yes
ambient conditions	
ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	90 %
protection class IP	IP20
design, dimensions and weights	
design	LOGO! module
width	71.5 mm
height	90 mm
depth	58.2 mm
net weight	0.15 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• wall mounting	Yes
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
product functions management, configuration, engineering	
product function	
• multiport mirroring	No
• switch-managed	No

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Technical specifications (continued)

Article number	6GK7177-1MA20-0AA0
standards, specifications, approvals	
certificate of suitability	
• CE marking	Yes
• cULus approval	Yes
• KC approval	No
• Regulatory Compliance Mark (RCM)	Yes
standard	
• for immunity to EMC	EN 61000-6-2
• for safety from CSA and UL	UL 508, CSA C22.2 No. 142
standards, specifications, approvals hazardous environments	
certificate of suitability	
• ATEX	Yes
• UKEX	Yes
• IECEx	Yes
• ULhazloc approval	Yes
• CCC for hazardous zone according to GB standard	Yes
• FM registration	Yes
standards, specifications, approvals other	
certificate of suitability	
• RoHS conformity	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	57.94 kg
• during manufacturing	7.42 kg
• during operation	50.38 kg
• after end of life	0.14 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



The flat power supply unit for distribution boards

Small. Clever. LOGO!Power: Thanks to its stepped profile design, the LOGO! 8 product line is ideally suited for installation in small distribution boards. The 12 V and 24 V versions are ideal for supplying LOGO! controllers with the corresponding voltage input. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to the integrated current monitor. The extended ambient temperature range from -25 °C to +70 °C enables a host of additional applications.

To further increase 24 V availability, the 24 V LOGO!Power power supply units can be combined with the **BUF1200 buffer module, DC UPS**, **redundancy** and **selectivity modules**.

This powerhouse can be used in any industry: e.g. in building technology applications for light and heating controllers or for access control systems. LOGO!Power is also well-suited for use in industrial automation, such as in packaging machine, machine tool, conveyor belt or sorting system applications.



Product highlights of the product line

- Low width
  with minimum of 18 mm to maximum of 72 mm, thus requiring very little space in the control cabinet or distribution board
- High energy efficiency
  with efficiency levels of up to 90% over the entire performance range and ERP-compliant no-load losses of < 0.3 W
- Global use
  due to operating temperature range from -25 °C to +70 °C and international certificates
- Supply
  of NEC Class 2 electric circuits with limited output current (100 VA)

Overview (continued)

- Load monitoring via current monitor
  using real-time measurement of the output current without disconnecting the cable, i.e. without interrupting the DC supply
- Flexible mounting
  with top hat DIN rail or wall mounting in different installation positions
- Flexible operation
  in all standard 1-phase supply networks thanks to wide-range input of 100 ... 240 V AC without switchover and operation on DC networks with 110 ... 300 V DC
- Reliability
  due to problem-free connection of loads with high inrush currents thanks to power reserve during startup as well as constant current in the event of overload

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Overview



Thanks to its stepped profile design, the LOGO!Power product line is ideally suited for installation in small distribution boards. The stabilized power supplies with wide-range input are available with an output voltage of 5 V in two performance classes.

Product highlights

- 1-phase, 5 V DC/ 3 A and 6.3 A
- Wide-range input, input voltage 100 ... 240 V AC (85 ... 264 V), 110 ... 300 V DC
- Narrow unit with 36 mm or 54 mm width and overall depth of 53 mm in LOGO! design
- Up to 80% efficiency
- Integrated current monitor: Actual output current measurement directly at the power supply unit
- cULus, cURus, NEC class 2, ABS, DNV GL certifications

Selection and ordering data

LOGO!Power 1-phase, 5 V DC/3 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V AC) Output: 5 V DC/3 A	**6EP3310-6SB00-0AY0**
LOGO!Power 1-phase, 5 V DC/6.3 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V AC) Output: 5 V DC/6.3 A	**6EP3311-6SB00-0AY0**

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Technical specifications

Article number	6EP3310-6SB00-0AY0	6EP3311-6SB00-0AY0
product brand name	LOGO!Power	LOGO!Power
type of current supply	5 V/3 A	5 V/6.3 A
General information		
Technical Product Detail Page	https://i.siemens.com/1P6EP3310-6SB00-0AY0	https://i.siemens.com/1P6EP3311-6SB00-0AY0
input		
type of the power supply network	1-phase AC or DC	1-phase AC or DC
supply voltage at AC		
• minimum rated value	100 V	100 V
• maximum rated value	240 V	240 V
• initial value	85 V	85 V
• full-scale value	264 V	264 V
input voltage at DC	110 ... 300 V	110 ... 300 V
wide range input	Yes	Yes
overvoltage overload capability	300 V AC for 1 s	300 V AC for 1 s
buffering time for rated value of the output current in the event of power failure minimum	40 ms	40 ms
operating condition of the mains buffering	at Vin = 187 V	at Vin = 187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	47 ... 63 Hz	47 ... 63 Hz
input current		
• at rated input voltage 120 V	0.36 A	0.71 A
• at rated input voltage 230 V	0.22 A	0.37 A
current limitation of inrush current at 25 °C maximum	26 A	50 A
I2t value maximum	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$
fuse protection type	internal	internal
fuse protection type in the feeder	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C
output		
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	5 V	5 V
output voltage		
• at output 1 at DC rated value	5 V	5 V
	5 V	5 V
output voltage adjustable	Yes; via potentiometer	Yes; via potentiometer
adjustable output voltage	4.6 ... 5.4 V	4.6 ... 5.4 V
relative overall tolerance of the voltage	3 %	3 %
relative control precision of the output voltage		
• on slow fluctuation of input voltage	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.1 %	0.1 %
residual ripple		
• maximum	100 mV	100 mV
• typical	30 mV	30 mV
voltage peak		
• maximum	100 mV	100 mV
• typical	50 mV	50 mV
display version for normal operation	Green LED for output voltage OK	Green LED for output voltage OK
behavior of the output voltage when switching on	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)

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Technical specifications (continued)

Article number	6EP3310-6SB00-0AY0	6EP3311-6SB00-0AY0
product brand name	LOGO!Power	LOGO!Power
type of current supply	5 V/3 A	5 V/6.3 A
response delay maximum	0.5 s	0.5 s
voltage increase time of the output voltage		
• typical	100 ms	100 ms
output current		
• rated value	3 A	6.3 A
• rated range	0 ... 3 A; +55 ... +70 °C: Derating 2%/K	0 ... 6.3 A; +55 ... +70 °C: Derating 2%/K
	2.6 ... 4.9 A	5.1 ... 9.9 A
supplied active power typical	15 W	31.5 W
bridging of equipment	Yes	Yes
number of parallel-switched equipment resources	2	2
efficiency		
efficiency in percent	76 %	79.8 %
power loss [W]		
• at rated output voltage for rated value of the output current typical	4.7 W	8 W
• during no-load operation maximum	0.3 W	0.3 W
closed-loop control		
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.2 %	0.2 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	5 %	7 %
setting time		
• load step 10 to 90% typical	1 ms	1 ms
• load step 90 to 10% typical	1 ms	1 ms
protection and monitoring		
design of the overvoltage protection	< 60 V	< 60 V
property of the output short-circuit proof	Yes	Yes
design of short-circuit protection	Constant current characteristic	Constant current characteristic
• typical	3.8 A	8.2 A
overcurrent overload capability		
• when switching on	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms
• in normal operation	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms
enduring short circuit current RMS value		
• maximum	3.8 A	8.2 A
measuring point for output current	Yes; 50 mV =^ 3 A	Yes; 50 mV =^ 6.3 A
safety		
galvanic isolation between input and output	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class II (without protective conductor)	Class II (without protective conductor)
protection class IP	IP20	IP20
EMC		
standard		
• for emitted interference	EN 55022 Class B	EN 55022 Class B
• for mains harmonics limitation	not applicable	not applicable
• for interference immunity	EN 61000-6-2	EN 61000-6-2

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Technical specifications (continued)

Article number	6EP3310-6SB00-0AY0	6EP3311-6SB00-0AY0
product brand name	LOGO!Power	LOGO!Power
type of current supply	5 V/3 A	5 V/6.3 A
standards, specifications, approvals		
certificate of suitability		
• CE marking	Yes	Yes
• UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273
• EAC approval	Yes	Yes
• NEC Class 2	Yes; according to UL1310, File E151273	No
• SEMI F47	Yes	Yes
type of certification		
• CB-certificate	Yes	Yes
MTBF at 40 °C	2 931 709 h	2 654 280 h
standards, specifications, approvals hazardous environments		
certificate of suitability		
• IECEx	No	No
• ATEX	No	No
• ULhazloc approval	No	No
• FM registration	No	No
standards, specifications, approvals marine classification		
shipbuilding approval	Yes	Yes
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	Yes	Yes
• French marine classification society (BV)	Yes	Yes
• Det Norske Veritas (DNV)	Yes	Yes
• Lloyds Register of Shipping (LRS)	Yes	Yes
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	131 kg	222.9 kg
• during manufacturing	2.3 kg	3.8 kg
• during operation	128.5 kg	218.9 kg
• after end of life	0.08 kg	0.14 kg
Siemens eco profile (SEP)	Siemens EcoTech	Siemens EcoTech
ambient conditions		
ambient temperature		
• during operation	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
connection method		
type of electrical connection	screw terminal	screw terminal
• at input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded
• at output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²
• for auxiliary contacts	-	-

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Technical specifications (continued)

Article number	6EP3310-6SB00-0AY0	6EP3311-6SB00-0AY0
product brand name	LOGO!Power	LOGO!Power
type of current supply	5 V/3 A	5 V/6.3 A
mechanical data		
width × height × depth of the enclosure	36 mm × 90 mm × 53 mm	54 mm × 90 mm × 53 mm
installation width × mounting height	36 mm × 130 mm	54 mm × 130 mm
required spacing		
• top	20 mm	20 mm
• bottom	20 mm	20 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
• DIN-rail mounting	Yes	Yes
• S7 rail mounting	No	No
• wall mounting	Yes	Yes
housing can be lined up	Yes	Yes
net weight	0.12 kg	0.2 kg
further information internet links		
internet link		
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
additional information		
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



Thanks to its stepped profile design, the LOGO!Power product line is ideally suited for installation in small distribution boards. The stabilized power supplies with wide-range input are available with an output voltage of 12 V in three performance classes. The 12 V versions are ideal for supplying LOGO! PLCs with the corresponding voltage input.

Product highlights

- 1-phase, 12 V DC/ 0.9 A, 1.9 A and 4.5 A
- Wide-range input, input voltage 100 ... 240 V AC (85 ... 264 V), 110 ... 300 V DC
- Narrow unit with width of 18 mm, 36 mm or 54 mm and overall depth of 53 mm in LOGO! design
- Up to 87.1% efficiency
- Integrated current monitor: actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- cULus, cURus, NEC class 2, ABS, DNV GL certifications

Selection and ordering data

LOGO!Power 1-phase, 12 V DC/0.9 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 12 V DC/0.9 A	**6EP3320-6SB00-0AY0**
LOGO!Power 1-phase, 12 V DC/1.9 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 12 V DC/1.9 A	**6EP3321-6SB00-0AY0**
LOGO!Power 1-phase, 12 V DC/4.5 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 12 V DC/4.5 A	**6EP3322-6SB00-0AY0**

Accessories

SITOP RED1200 redundancy modules	For more information, visit: www.siemens.com/sitop-redundancy/mall

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Technical specifications

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
product brand name	LOGO!Power	LOGO!Power	LOGO!Power
type of current supply	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
General information			
Technical Product Detail Page	https://i.siemens.com/1P6EP3320-6SB00-0AY0	https://i.siemens.com/1P6EP3321-6SB00-0AY0	https://i.siemens.com/1P6EP3322-6SB00-0AY0
input			
type of the power supply network	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC
supply voltage at AC			
• minimum rated value	100 V	100 V	100 V
• maximum rated value	240 V	240 V	240 V
• initial value	85 V	85 V	85 V
• full-scale value	264 V	264 V	264 V
input voltage at DC	110 ... 300 V	110 ... 300 V	110 ... 300 V
wide range input	Yes	Yes	Yes
overvoltage overload capability	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s
buffering time for rated value of the output current in the event of power failure minimum	40 ms	40 ms	40 ms
operating condition of the mains buffering	at Vin = 187 V	at Vin = 187 V	at Vin = 187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
input current			
• at rated input voltage 120 V	0.3 A	0.53 A	1.13 A
• at rated input voltage 230 V	0.2 A	0.3 A	0.61 A
current limitation of inrush current at 25 °C maximum	20 A	25 A	50 A
I2t value maximum	0.8 $A^2 \cdot s$	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$
fuse protection type	internal	internal	internal
fuse protection type in the feeder	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C
output			
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	12 V	12 V	12 V
output voltage			
• at output 1 at DC rated value	12 V	12 V	12 V
	12 V	12 V	12 V
output voltage adjustable	No	Yes; via potentiometer	Yes; via potentiometer
adjustable output voltage		10.5 ... 16.1 V	10.5 ... 16.1 V
relative overall tolerance of the voltage	3 %	3 %	3 %
relative control precision of the output voltage			
• on slow fluctuation of input voltage	0.1 %	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.1 %	0.1 %	0.1 %
residual ripple			
• maximum	200 mV	200 mV	200 mV
• typical	30 mV	30 mV	30 mV
voltage peak			
• maximum	300 mV	300 mV	300 mV
• typical	50 mV	50 mV	50 mV
display version for normal operation	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
behavior of the output voltage when switching on	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)

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Technical specifications (continued)

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
product brand name	LOGO!Power	LOGO!Power	LOGO!Power
type of current supply	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
response delay maximum	0.5 s	0.5 s	0.5 s
voltage increase time of the output voltage			
• typical	100 ms	100 ms	100 ms
output current			
• rated value	0.9 A	1.9 A	4.5 A
• rated range	0 ... 0.9 A; +55 ... +70 °C: Derating 2%/K	0 ... 1.9 A; +55 ... +70 °C: Derating 2%/K	0 ... 4.5 A; +55 ... +70 °C: Derating 2%/K
	0.0 ... 2.4 A	0.0 ... 2.4 A	2.6 ... 4.9 A
supplied active power typical	10.8 W	22.8 W	54 W
bridging of equipment	No	Yes	Yes
number of parallel-switched equipment resources		2	2
efficiency			
efficiency in percent	78 %	81 %	87 %
power loss [W]			
• at rated output voltage for rated value of the output current typical	3 W	5.3 W	8 W
• during no-load operation maximum	0.3 W	0.3 W	0.3 W
closed-loop control			
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.2 %	0.2 %	0.2 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	3 %	2 %	4 %
setting time			
• load step 10 to 90% typical	1 ms	1 ms	1 ms
• load step 90 to 10% typical	1 ms	1 ms	1 ms
protection and monitoring			
design of the overvoltage protection	< 60 V	< 60 V	< 60 V
property of the output short-circuit proof	Yes	Yes	Yes
design of short-circuit protection	Constant current characteristic	Constant current characteristic	Constant current characteristic
• typical	1.3 A	2.5 A	5 A
overcurrent overload capability			
• when switching on	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms
• in normal operation	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms
enduring short circuit current RMS value			
• maximum	1.3 A	2.5 A	5 A
measuring point for output current	No	Yes; 50 mV =^ 1.9 A	Yes; 50 mV =^ 4.5 A
safety			
galvanic isolation between input and output	Yes	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
protection class IP	IP20	IP20	IP20
EMC			
standard			
• for emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
• for mains harmonics limitation	not applicable	not applicable	not applicable
• for interference immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2

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Technical specifications (continued)

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
product brand name	LOGO!Power	LOGO!Power	LOGO!Power
type of current supply	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
standards, specifications, approvals			
certificate of suitability			
• CE marking	Yes	Yes	Yes
• UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)
• EAC approval	Yes	Yes	Yes
• NEC Class 2	Yes; according to UL1310, File E151273	Yes; according to UL1310, File E151273	Yes; according to UL1310, File E151273
• SEMI F47	Yes	Yes	Yes
type of certification			
• CB-certificate	Yes	Yes	Yes
MTBF at 40 °C	3 793 080 h	2 938 542 h	2 566 680 h
standards, specifications, approvals hazardous environments			
certificate of suitability			
• IECEx	No	No	No
• ATEX	No	No	No
• ULhazloc approval	No	No	No
• FM registration	No	No	No
standards, specifications, approvals marine classification			
shipbuilding approval	Yes	Yes	Yes
Marine classification association			
• American Bureau of Shipping Europe Ltd. (ABS)	Yes	Yes	Yes
• French marine classification society (BV)	Yes	Yes	Yes
• Det Norske Veritas (DNV)	Yes	Yes	Yes
• Lloyds Register of Shipping (LRS)	Yes	Yes	Yes
standards, specifications, approvals Environmental Product Declaration			
Environmental Product Declaration	Yes	Yes	Yes
global warming potential [CO2 eq]			
• total	83.3 kg	147.3 kg	222.9 kg
• during manufacturing	1.3 kg	2.3 kg	3.8 kg
• during operation	81.9 kg	145 kg	218.9 kg
• after end of life	0.05 kg	0.08 kg	0.14 kg
Siemens eco profile (SEP)	Siemens EcoTech	Siemens EcoTech	Siemens EcoTech
ambient conditions			
ambient temperature			
• during operation	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
connection method			
type of electrical connection	screw terminal	screw terminal	screw terminal
• at input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded
• at output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²
• for auxiliary contacts	-	-	-

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Technical specifications (continued)

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
product brand name	LOGO!Power	LOGO!Power	LOGO!Power
type of current supply	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
mechanical data			
width × height × depth of the enclosure	18 mm × 90 mm × 53 mm	36 mm × 90 mm × 53 mm	54 mm × 90 mm × 53 mm
installation width × mounting height	18 mm × 130 mm	36 mm × 130 mm	54 mm × 130 mm
required spacing			
• top	20 mm	20 mm	20 mm
• bottom	20 mm	20 mm	20 mm
• left	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
• DIN-rail mounting	Yes	Yes	Yes
• S7 rail mounting	No	No	No
• wall mounting	Yes	Yes	Yes
housing can be lined up	Yes	Yes	Yes
net weight	0.07 kg	0.12 kg	0.2 kg
further information internet links			
internet link			
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop	https://siemens.com/sitop	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com	https://support.industry.siemens.com
additional information			
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



Thanks to its stepped profile design, the LOGO!Power product line is ideally suited for installation in small distribution boards. The stabilized power supplies with a wide-range input are available with an output voltage of 15 V in two performance classes.

Product highlights

- 1-phase, 15 V DC/ 1.9 A and 4.0 A
- Wide-range input, input voltage 100 ... 240 V AC (85 ... 264 V), 110 ... 300 V DC
- Narrow unit with 36 mm or 54 mm width and overall depth of 53 mm in LOGO! design
- Up to 88.4% efficiency
- Integrated current monitor: actual output current measurement directly at the power supply unit
- cULus, cURus, NEC class 2, ABS, BV, DNV GL, LRS certifications

Selection and ordering data

LOGO!Power 1-phase, 15 V DC/1.9 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 15 V DC/1.9 A	**6EP3321-6SB10-0AY0**
LOGO!Power 1-phase, 15 V DC/4 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 15 V DC/4 A	**6EP3322-6SB10-0AY0**

Accessories

SITOP RED1200 redundancy modules	For more information, visit: www.siemens.com/sitop-redundancy/mall

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Technical specifications

Article number	6EP3321-6SB10-0AY0	6EP3322-6SB10-0AY0
product brand name	LOGO!Power	LOGO!Power
type of current supply	15 V/1.9 A	15 V/4 A
General information		
Technical Product Detail Page	https://i.siemens.com/1P6EP3321-6SB10-0AY0	https://i.siemens.com/1P6EP3322-6SB10-0AY0
input		
type of the power supply network	1-phase AC or DC	1-phase AC or DC
supply voltage at AC		
• minimum rated value	100 V	100 V
• maximum rated value	240 V	240 V
• initial value	85 V	85 V
• full-scale value	264 V	264 V
input voltage at DC	110 ... 300 V	110 ... 300 V
wide range input	Yes	Yes
overvoltage overload capability	300 V AC for 1 s	300 V AC for 1 s
buffering time for rated value of the output current in the event of power failure minimum	40 ms	40 ms
operating condition of the mains buffering	at Vin = 187 V	at Vin = 187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	47 ... 63 Hz	47 ... 63 Hz
input current		
• at rated input voltage 120 V	0.63 A	1.24 A
• at rated input voltage 230 V	0.33 A	0.68 A
current limitation of inrush current at 25 °C maximum	25 A	55 A
I2t value maximum	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$
fuse protection type	internal	internal
fuse protection type in the feeder	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C
output		
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	15 V	15 V
output voltage		
• at output 1 at DC rated value	15 V	15 V
	15 V	15 V
output voltage adjustable	Yes; via potentiometer	Yes; via potentiometer
adjustable output voltage	10.5 ... 16.1 V	10.5 ... 16.1 V
relative overall tolerance of the voltage	3 %	3 %
relative control precision of the output voltage		
• on slow fluctuation of input voltage	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.1 %	0.1 %
residual ripple		
• maximum	200 mV	200 mV
• typical	30 mV	30 mV
voltage peak		
• maximum	300 mV	300 mV
• typical	50 mV	50 mV
display version for normal operation	Green LED for output voltage OK	Green LED for output voltage OK
behavior of the output voltage when switching on	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)

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Technical specifications (continued)

Article number	6EP3321-6SB10-0AY0	6EP3322-6SB10-0AY0
product brand name	LOGO!Power	LOGO!Power
type of current supply	15 V/1.9 A	15 V/4 A
response delay maximum	0.5 s	0.5 s
voltage increase time of the output voltage		
• typical	100 ms	100 ms
output current		
• rated value	1.9 A	4 A
• rated range	0 ... 1.9 A; +55 ... +70 °C: Derating 2%/K	0 ... 4 A; +55 ... +70 °C: Derating 2%/K
	0.0 ... 2.4 A	2.6 ... 4.9 A
supplied active power typical	28.5 W	60 W
bridging of equipment	Yes	Yes
number of parallel-switched equipment resources	2	2
efficiency		
efficiency in percent	83.4 %	88.4 %
power loss [W]		
• at rated output voltage for rated value of the output current typical	5.7 W	7.9 W
• during no-load operation maximum	0.3 W	0.3 W
closed-loop control		
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.2 %	0.2 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	2 %	3 %
setting time		
• load step 10 to 90% typical	1 ms	1 ms
• load step 90 to 10% typical	1 ms	1 ms
protection and monitoring		
design of the overvoltage protection	< 60 V	< 60 V
property of the output short-circuit proof	Yes	Yes
design of short-circuit protection	Constant current characteristic	Constant current characteristic
• typical	2.5 A	5 A
overcurrent overload capability		
• when switching on	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms
• in normal operation	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms
enduring short circuit current RMS value		
• maximum	2.5 A	5 A
measuring point for output current	Yes; 50 mV =^ 1.9 A	Yes; 45 mV =^ 4 A
safety		
galvanic isolation between input and output	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class II (without protective conductor)	Class II (without protective conductor)
protection class IP	IP20	IP20
EMC		
standard		
• for emitted interference	EN 55022 Class B	EN 55022 Class B
• for mains harmonics limitation	not applicable	not applicable
• for interference immunity	EN 61000-6-2	EN 61000-6-2

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Technical specifications (continued)

Article number	6EP3321-6SB10-0AY0	6EP3322-6SB10-0AY0
product brand name	LOGO!Power	LOGO!Power
type of current supply	15 V/1.9 A	15 V/4 A
standards, specifications, approvals		
certificate of suitability		
• CE marking	Yes	Yes
• UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)
• EAC approval	Yes	Yes
• NEC Class 2	Yes; according to UL1310, File E151273	Yes; according to UL1310, File E151273
• SEMI F47	Yes	Yes
type of certification		
• CB-certificate	Yes	Yes
MTBF at 40 °C	2 938 542 h	2 566 680 h
standards, specifications, approvals hazardous environments		
certificate of suitability		
• IECEx	No	No
• ATEX	No	No
• ULhazloc approval	No	No
• FM registration	No	No
standards, specifications, approvals marine classification		
shipbuilding approval	Yes	Yes
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	Yes	Yes
• French marine classification society (BV)	Yes	Yes
• Det Norske Veritas (DNV)	Yes	Yes
• Lloyds Register of Shipping (LRS)	Yes	Yes
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	158.1 kg	220 kg
• during manufacturing	2.3 kg	3.8 kg
• during operation	155.8 kg	216 kg
• after end of life	0.08 kg	0.14 kg
Siemens eco profile (SEP)	Siemens EcoTech	Siemens EcoTech
ambient conditions		
ambient temperature		
• during operation	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
connection method		
type of electrical connection	screw terminal	screw terminal
• at input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded
• at output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²
• for auxiliary contacts	-	-

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Technical specifications (continued)

Article number	6EP3321-6SB10-0AY0	6EP3322-6SB10-0AY0
product brand name	LOGO!Power	LOGO!Power
type of current supply	15 V/1.9 A	15 V/4 A
mechanical data		
width × height × depth of the enclosure	36 mm × 90 mm × 53 mm	54 mm × 90 mm × 53 mm
installation width × mounting height	36 mm × 130 mm	54 mm × 130 mm
required spacing		
• top	20 mm	20 mm
• bottom	20 mm	20 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
• DIN-rail mounting	Yes	Yes
• S7 rail mounting	No	No
• wall mounting	Yes	Yes
housing can be lined up	Yes	Yes
net weight	0.12 kg	0.2 kg
further information internet links		
internet link		
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
additional information		
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



Thanks to its stepped profile design, the LOGO!Power product line is ideally suited for installation in small distribution boards. The stabilized power supplies with wide-range input are available with an output voltage of 24 V in four performance classes. The 24 V variants are ideal for supplying LOGO! PLCs with the corresponding voltage input.

To further increase the 24 V availability, the LOGO!Power power supply units can be combined with **DC UPS**, **redundancy** and **selectivity modules**.

Product highlights

- 1-phase, 24 V DC/ 0.6 A, 1.3 A, 2.5 A and 4.0 A
- Input voltage 100 ... 240 V AC (85 ... 264 V), 110 ... 300 V DC
- Narrow unit with width of 18 mm, 36 mm, 54 mm or 72 mm and overall depth of 53 mm in LOGO! design
- Up to 90% efficiency
- Integrated current monitor: Actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- cULus, cURus, NEC class 2, ABS, BV, DNV GL, LRS certifications
- LOGO!Power Ex 24 V/4.0 A, for use in Zone 2 hazardous environments (gases, vapors or mists)

Selection and ordering data

LOGO!Power 1-phase, 24 V DC/0.6 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 24 V DC/0.6 A	**6EP3330-6SB00-0AY0**
LOGO!Power 1-phase, 24 V DC/1.3 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 24 V DC/1.3 A	**6EP3331-6SB00-0AY0**
LOGO!Power 1-phase, 24 V DC/2.5 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 24 V DC/2.5 A	**6EP3332-6SB00-0AY0**
LOGO!Power 1-phase, 24 V DC/4 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 24 V DC/4 A	**6EP3333-6SB00-0AY0**
LOGO!Power Ex 1-phase, 24 V DC/4 A Stabilized power supply Input: 100 ... 240 V AC (110 ... 300 V DC) Output: 24 V DC/4 A	**6EP3333-6SC00-0AY0**

Accessories

SITOP redundancy modules	For more information, visit: www.siemens.com/sitop-redundancy/mall
SITOP selectivity modules	For more information, visit: www.siemens.com/sitop-selectivity/mall
SITOP BUF1200 buffer module	For more information, visit: www.siemens.com/sitop-buffering/mall
SITOP DC UPS	For more information, visit: www.siemens.com/sitop-ups/mall

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Technical specifications

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0	6EP3333-6SC00-0AY0
product brand name	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
type of current supply	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A	24 V/4 A
General information					
Technical Product Detail Page	https://i.siemens.com/1P6EP3330-6SB0-0-0AY0	https://i.siemens.com/1P6EP3331-6SB0-0-0AY0	https://i.siemens.com/1P6EP3332-6SB0-0-0AY0	https://i.siemens.com/1P6EP3333-6SB0-0-0AY0	https://i.siemens.com/1P6EP3333-6SC0-0-0AY0
input					
type of the power supply network	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC
supply voltage at AC					
• minimum rated value	100 V	100 V	100 V	100 V	100 V
• maximum rated value	240 V	240 V	240 V	240 V	240 V
• initial value	85 V	85 V	85 V	85 V	85 V
• full-scale value	264 V	264 V	264 V	264 V	264 V
input voltage at DC	110 ... 300 V	110 ... 300 V	110 ... 300 V	110 ... 300 V	110 ... 300 V
wide range input	Yes	Yes	Yes	Yes	Yes
overvoltage overload capability	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s
buffering time for rated value of the output current in the event of power failure minimum	40 ms	40 ms	40 ms	40 ms	40 ms
operating condition of the mains buffering	at Vin = 187 V	at Vin = 187 V	at Vin = 187 V	at Vin = 187 V	at Vin = 187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
input current					
• at rated input voltage 120 V	0.3 A	0.7 A	1.22 A	1.95 A	1.95 A
• at rated input voltage 230 V	0.2 A	0.35 A	0.66 A	0.97 A	0.97 A
current limitation of inrush current at 25 °C maximum	20 A	25 A	52 A	31 A	31 A
I2t value maximum	0.8 $A^2 \cdot s$	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$	2.5 $A^2 \cdot s$	2.5 $A^2 \cdot s$
fuse protection type	internal	internal	internal	internal	internal
fuse protection type in the feeder	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C
output					
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	24 V	24 V	24 V	24 V	24 V
output voltage					
• at output 1 at DC rated value	24 V	24 V	24 V	24 V	24 V
	24 V	24 V	24 V	24 V	24 V
output voltage adjustable	No	Yes; via potentiometer	Yes; via potentiometer	Yes; via potentiometer	Yes; via potentiometer
adjustable output voltage		22.2 ... 26.4 V	22.2 ... 26.4 V	22.2 ... 26.4 V	22.2 ... 26.4 V
relative overall tolerance of the voltage	3 %	3 %	3 %	3 %	3 %
relative control precision of the output voltage					
• on slow fluctuation of input voltage	0.1 %	0.1 %	0.1 %	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.1 %	0.1 %	0.1 %	0.1 %	0.1 %
residual ripple					
• maximum	200 mV	200 mV	200 mV	200 mV	200 mV
• typical	30 mV	30 mV	30 mV	30 mV	30 mV
voltage peak					
• maximum	300 mV	300 mV	300 mV	300 mV	300 mV
• typical	50 mV	50 mV	50 mV	50 mV	50 mV
display version for normal operation	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
behavior of the output voltage when switching on	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)

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Technical specifications (continued)

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0	6EP3333-6SC00-0AY0
product brand name type of current supply	LOGO!Power 24 V/0.6 A	LOGO!Power 24 V/1.3 A	LOGO!Power 24 V/2.5 A	LOGO!Power 24 V/4 A	LOGO!Power 24 V/4 A
response delay maximum	0.5 s	0.5 s	0.5 s	0.5 s	0.5 s
voltage increase time of the output voltage					
• typical	100 ms	100 ms	100 ms	100 ms	100 ms
output current					
• rated value	0.6 A	1.3 A	2.5 A	4 A	4 A
• rated range	0 ... 0.6 A; +55 ... +70 °C: Derating 2%/K	0 ... 1.3 A; +55 ... +70 °C: Derating 2%/K	0 ... 2.5 A; +55 ... +70 °C: Derating 2%/K	0 ... 4 A; +55 ... +70 °C: Derating 2%/K	0 ... 4 A; +55 ... +70 °C: Derating 2%/K
	0.0 ... 2.4 A	0.0 ... 2.4 A	2.5 A	2.6 ... 4.9 A	2.6 ... 4.9 A
supplied active power typical	14.4 W	31.2 W	60 W	96 W	96 W
bridging of equipment	No	Yes	Yes	Yes	
number of parallel-switched equipment resources		2	2	2	
efficiency					
efficiency in percent	81 %	86 %	89.5 %	89 %	89 %
power loss [W]					
• at rated output voltage for rated value of the output current typical	3.4 W	5.1 W	7 W	11.7 W	11.7 W
• during no-load operation maximum	0.3 W	0.3 W	0.3 W	0.3 W	0.3 W
closed-loop control					
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.2 %	0.2 %	0.2 %	0.2 %	0.2 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	2 %	1 %	2 %	2 %	2 %
setting time					
• load step 10 to 90% typical	1 ms	1 ms	1 ms	1 ms	1 ms
• load step 90 to 10% typical	1 ms	1 ms	1 ms	1 ms	1 ms
protection and monitoring					
design of the overvoltage protection	< 60 V	< 60 V	< 60 V	< 60 V	< 60 V
property of the output short-circuit proof	Yes	Yes	Yes	Yes	Yes
design of short-circuit protection	Constant current characteristic	Constant current characteristic	Constant current characteristic	Constant current characteristic	Constant current characteristic
• typical	0.8 A	1.7 A	3.2 A	5 A	5 A
overcurrent overload capability					
• when switching on	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms
• in normal operation	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms
enduring short circuit current RMS value					
• maximum	0.8 A	1.7 A	3.2 A	5 A	5 A
measuring point for output current	No	Yes; 50 mV =^ 1.3 A	Yes; 50 mV =^ 2.5 A	Yes; 50 mV =^ 4 A	Yes; 50 mV =^ 4 A
safety					
galvanic isolation between input and output	Yes	Yes	Yes	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
protection class IP	IP20	IP20	IP20	IP20	IP20

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Technical specifications (continued)

Article number product brand name type of current supply	6EP3330-6SB00-0AY0 LOGO!Power 24 V/0.6 A	6EP3331-6SB00-0AY0 LOGO!Power 24 V/1.3 A	6EP3332-6SB00-0AY0 LOGO!Power 24 V/2.5 A	6EP3333-6SB00-0AY0 LOGO!Power 24 V/4 A	6EP3333-6SC00-0AY0 LOGO!Power 24 V/4 A
EMC					
standard					
• for emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
• for mains harmonics limitation	not applicable	not applicable	not applicable	EN 61000-3-2	EN 61000-3-2
• for interference immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
standards, specifications, approvals					
certificate of suitability					
• CE marking	Yes	Yes	Yes	Yes	Yes
• UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950-1, CSA C22.2 No. 60950-1) File E151273
• UKCA marking					Yes
• EAC approval	Yes	Yes	Yes	Yes	
• NEC Class 2	Yes; according to UL1310, File E151273	Yes; according to UL1310, File E151273	Yes; according to UL1310, File E151273	No	No
• SEMI F47	Yes	Yes	Yes	Yes	
type of certification					
• BIS		Yes; R-41188271	Yes; R-41188271	Yes; R-41188271	
• CB-certificate	Yes	Yes	Yes	Yes	Yes
MTBF at 40 °C	4 415 040 h	3 094 996 h	2 864 520 h	2 391 480 h	2 391 480 h
standards, specifications, approvals hazardous environments					
certificate of suitability					
• IECEx	No	No	No	No	Yes; IECEx Ex ec IIC T3 Gc
• ATEX	No	No	No	No	Yes; ATEX (EX) II 3G Ex ec IIC T3 Gc
• ULhazloc approval	No	No	No	No	Yes
• UKEX					Yes
• CCC for hazardous zone according to GB standard					Yes
• FM registration	No	No	No	No	No
standards, specifications, approvals marine classification					
shipbuilding approval	Yes	Yes	Yes	Yes	No
Marine classification association					
• American Bureau of Shipping Europe Ltd. (ABS)	Yes	Yes	Yes	Yes	No
• French marine classification society (BV)	Yes	Yes	Yes	Yes	Yes
• Det Norske Veritas (DNV)	Yes	Yes	Yes	Yes	No; in preparation
• Lloyds Register of Shipping (LRS)	Yes	Yes	Yes	Yes	No
standards, specifications, approvals Environmental Product Declaration					
Environmental Product Declaration	Yes	Yes	Yes	Yes	Yes
global warming potential [CO2 eq]					
• total	94.5 kg	141.9 kg	195.3 kg	326 kg	326 kg
• during manufacturing	1.3 kg	2.3 kg	3.8 kg	5.5 kg	5.5 kg
• during operation	93 kg	139.5 kg	191.4 kg	320 kg	320 kg
• after end of life	0.05 kg	0.08 kg	0.14 kg	0.2 kg	0.2 kg
Siemens eco profile (SEP)	Siemens EcoTech	Siemens EcoTech	Siemens EcoTech	Siemens EcoTech	Siemens EcoTech

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Technical specifications (continued)

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0	6EP3333-6SC00-0AY0
product brand name	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
type of current supply	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A	24 V/4 A
ambient conditions					
ambient temperature					
• during operation	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
connection method					
type of electrical connection	screw terminal	screw terminal	screw terminal	screw terminal	screw terminal
• at input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded
• at output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²	+, -: 1 screw terminal each for 0.5 ... 2.5 mm²
• for auxiliary contacts	-	-	-	-	-
mechanical data					
width × height × depth of the enclosure	18 mm × 90 mm × 53 mm	36 mm × 90 mm × 53 mm	54 mm × 90 mm × 53 mm	72 mm × 90 mm × 53 mm	72 mm × 90 mm × 53 mm
installation width × mounting height	18 mm × 130 mm	36 mm × 130 mm	54 mm × 130 mm	72 mm × 130 mm	72 mm × 130 mm
required spacing					
• top	20 mm	20 mm	20 mm	20 mm	20 mm
• bottom	20 mm	20 mm	20 mm	20 mm	20 mm
• left	0 mm	0 mm	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm	0 mm	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
• DIN-rail mounting	Yes	Yes	Yes	Yes	Yes
• S7 rail mounting	No	No	No	No	No
• wall mounting	Yes	Yes	Yes	Yes	Yes
housing can be lined up	Yes	Yes	Yes	Yes	Yes
net weight	0.07 kg	0.12 kg	0.2 kg	0.29 kg	0.29 kg
further information internet links					
internet link					
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com	https://mall.industry.siemens.com	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop	https://siemens.com/sitop	https://siemens.com/sitop	https://siemens.com/sitop	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax	https://siemens.com/cax	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com	https://support.industry.siemens.com	https://support.industry.siemens.com	https://support.industry.siemens.com
additional information					
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



Thanks to its stepped profile design, the SIPLUS LOGO!Power product family is ideally suited for low installation depths, such as in miniature distribution boards. The stabilized power supplies with a wide-range input of 100 ... 240 V AC (85 ... 264 V) and 110 ... 300 V DC are available with an output voltage of 24 V in four performance classes. The 24 V versions are ideal for supplying SIPLUS LOGO! PLCs with the corresponding voltage input. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to integrated current monitor (for devices at least 36 mm wide). The extended temperature range enables a host of additional applications.

Main product highlights

- 24 V DC / 1.3 A, 2.5 A and 4.0 A
- Narrow unit with width of 36 mm, 54 mm or 72 mm and overall depth of 53 mm in LOGO! design
- Flexible mounting: top hat DIN rail or wall mounting in a range of installation positions
- Higher energy efficiency: up to 90% efficiency over the entire load range as well as no-load power losses of < 0.3 W
- Integrated current monitor: Actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- Global use: International certifications such as UL, CSA, FM or ATEX

Selection and ordering data

SIPLUS LOGO!Power 24 V 1.3 A Extended temperature range and exposure to environmental substances Input 100 ... 240 V AC Output 24 V DC, 1.3 A	**6AG1331-6SB00-7AY0**
SIPLUS LOGO!Power 24 V 2.5 A Extended temperature range and exposure to environmental substances Input 100 ... 240 V AC Output 24 V DC, 2.5 A	**6AG1332-6SB00-7AY0**
SIPLUS LOGO!Power 24 V 4 A Extended temperature range and exposure to environmental substances Input 100 ... 240 V AC Output 24 V DC, 4 A	**6AG1333-6SB00-7AY0**

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Technical specifications

Article number	6AG1331-6SB00-7AY0	6AG1332-6SB00-7AY0	6AG1333-6SB00-7AY0
product brand name	SIPLUS	SIPLUS	SIPLUS
type of current supply	24 V/1.3 A	24 V/2.5 A	24 V/4 A
General information			
Technical Product Detail Page	https://i.siemens.com/1P6AG1331-6SB00-7AY0	https://i.siemens.com/1P6AG1332-6SB00-7AY0	https://i.siemens.com/1P6AG1333-6SB00-7AY0
manufacturer's article number of the basic version used for SIPLUS product versions	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0
input			
type of the power supply network	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC
supply voltage at AC			
• minimum rated value	100 V	100 V	100 V
• maximum rated value	240 V	240 V	240 V
• initial value	85 V	85 V	85 V
• full-scale value	264 V	264 V	264 V
input voltage at DC	110 ... 300 V	110 ... 300 V	110 ... 300 V
wide range input	Yes	Yes	Yes
buffering time for rated value of the output current in the event of power failure minimum	40 ms	40 ms	40 ms
operating condition of the mains buffering	at Vin = 187 V	at Vin = 187 V	at Vin = 187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
input current			
• at rated input voltage 120 V	0.7 A	1.22 A	1.95 A
• at rated input voltage 230 V	0.35 A	0.66 A	0.97 A
current limitation of inrush current at 25 °C maximum	25 A	52 A	31 A
I2t value maximum	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$	2.5 $A^2 \cdot s$
fuse protection type	internal	internal	internal
fuse protection type in the feeder	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C
output			
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	24 V	24 V	24 V
output voltage			
• at output 1 at DC rated value	24 V	24 V	24 V
	24 V	24 V	24 V
output voltage adjustable	Yes; via potentiometer	Yes; via potentiometer	Yes; via potentiometer
adjustable output voltage	22.2 ... 26.4 V	22.2 ... 26.4 V	22.2 ... 26.4 V
relative overall tolerance of the voltage	3 %	3 %	3 %
relative control precision of the output voltage			
• on slow fluctuation of input voltage	0.1 %	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.1 %	0.1 %	0.1 %
residual ripple			
• maximum	200 mV	200 mV	200 mV
• typical	30 mV	30 mV	30 mV
voltage peak			
• maximum	300 mV	300 mV	300 mV
• typical	50 mV	50 mV	50 mV
display version for normal operation	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
behavior of the output voltage when switching on	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)

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Technical specifications (continued)

Article number	6AG1331-6SB00-7AY0	6AG1332-6SB00-7AY0	6AG1333-6SB00-7AY0
product brand name	SIPLUS	SIPLUS	SIPLUS
type of current supply	24 V/1.3 A	24 V/2.5 A	24 V/4 A
response delay maximum	0.5 s	0.5 s	0.5 s
voltage increase time of the output voltage			
• typical	100 ms	100 ms	100 ms
output current			
• rated value	1.3 A	2.5 A	4 A
• rated range	0 ... 1.3 A; +55 ... +70 °C: Derating 2%/K	0 ... 2.5 A; +55 ... +70 °C: Derating 2%/K	0 ... 4 A; +55 ... +70 °C: Derating 2%/K
	0.0 ... 2.4 A	2.5 A	2.6 ... 4.9 A
supplied active power typical	31.2 W	60 W	96 W
bridging of equipment	Yes	Yes	Yes
number of parallel-switched equipment resources	2	2	2
efficiency			
efficiency in percent	86 %	90 %	89 %
power loss [W]			
• at rated output voltage for rated value of the output current typical	5 W	7 W	12 W
• during no-load operation maximum	0.3 W	0.3 W	0.3 W
closed-loop control			
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.2 %	0.2 %	0.2 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	1 %	2 %	2 %
setting time			
• load step 10 to 90% typical	1 ms	1 ms	1 ms
• load step 90 to 10% typical	1 ms	1 ms	1 ms
protection and monitoring			
design of the overvoltage protection	< 60 V	< 60 V	< 60 V
property of the output short-circuit proof	Yes	Yes	Yes
design of short-circuit protection	Constant current characteristic	Constant current characteristic	Constant current characteristic
• typical	1.7 A	3.2 A	5 A
overcurrent overload capability			
• when switching on	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms	150% Iout rated typ. 200 ms
• in normal operation	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms
enduring short circuit current RMS value			
• maximum	1.7 A	3.2 A	5 A
measuring point for output current	Yes; 50 mV =^ 1.3 A	Yes; 50 mV =^ 2.5 A	Yes; 50 mV =^ 4 A
safety			
galvanic isolation between input and output	Yes	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
protection class IP	IP20	IP20	IP20
EMC			
standard			
• for emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
• for mains harmonics limitation	not applicable	not applicable	EN 61000-3-2
• for interference immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
standards, specifications, approvals			
certificate of suitability			
• CE marking	Yes	Yes	Yes
• UKCA marking	Yes	Yes	Yes
• Regulatory Compliance Mark (RCM)	Yes	Yes	Yes
MTBF at 40 °C	3 094 996 h	2 864 520 h	2 391 480 h

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Technical specifications (continued)

Article number	6AG1331-6SB00-7AY0	6AG1332-6SB00-7AY0	6AG1333-6SB00-7AY0
product brand name	SIPLUS	SIPLUS	SIPLUS
type of current supply	24 V/1.3 A	24 V/2.5 A	24 V/4 A
ambient conditions			
ambient temperature			
• in horizontal mounting position during operation	-40; Startup @ -25 °C ... +70 °C; with natural convection	-40; Startup @ -25 °C ... +70 °C; with natural convection	-40; Startup @ -25 °C ... +70 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
installation altitude at height above sea level maximum	6 000 m	6 000 m	6 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m
relative humidity with condensation according to IEC 60068-2-38 maximum	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
resistance to biologically active substances conformity according to EN 60721-3-3	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request
resistance to chemically active substances conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)
resistance to mechanically active substances conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust
resistance to biologically active substances conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)
resistance to chemically active substances conformity according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)
resistance to mechanically active substances conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
type of test of the coating according to MIL-I-46058C	Yes; Discoloration of the coating during service life possible	Yes; Discoloration of the coating during service life possible	Yes; Discoloration of the coating during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal Coating, Class A	Yes; Conformal Coating, Class A	Yes; Conformal Coating, Class A
connection method			
type of electrical connection	screw terminal	screw terminal	screw terminal
• at input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded
• at output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²
• for auxiliary contacts	-	-	-

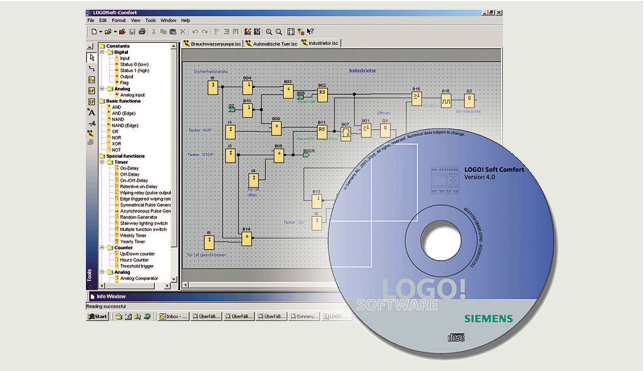
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Technical specifications (continued)

Article number	6AG1331-6SB00-7AY0	6AG1332-6SB00-7AY0	6AG1333-6SB00-7AY0
product brand name	SIPLUS	SIPLUS	SIPLUS
type of current supply	24 V/1.3 A	24 V/2.5 A	24 V/4 A
mechanical data			
width × height × depth of the enclosure	36 mm × 90 mm × 53 mm	54 mm × 90 mm × 53 mm	72 mm × 90 mm × 53 mm
installation width × mounting height	36 mm × 130 mm	54 mm × 130 mm	72 mm × 130 mm
required spacing			
• top	20 mm	20 mm	20 mm
• bottom	20 mm	20 mm	20 mm
• left	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
• DIN-rail mounting	Yes	Yes	Yes
• S7 rail mounting	No	No	No
• wall mounting	Yes	Yes	Yes
housing can be lined up	Yes	Yes	Yes
net weight	0.12 kg	0.2 kg	0.29 kg
further information internet links			
internet link			
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com	https://support.industry.siemens.com
additional information			
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



- The user-friendly software for generating switching programs on the PC for single-user mode and network mode
- Generation of switching programs in a function block diagram (FBD) or ladder logic (LAD)
- Furthermore, testing, simulation, online testing and archiving of the switching programs
- Professional documentation with the help of various comment and print functions

Supported operating systems

- Windows 10 (64-bit), Windows 11 (64-bit)
- Mac OS 11 Big Sur, 12.1, Monterey, 13.6 Ventura, 14.5 Sonoma, 15 Sequoia
- SUSE Linux: tested SUSE Linux 15 (64-bit), Kylin Desktop V10 SP1

Selection and ordering data

LOGO! SOFT Comfort V9 Single license for 1 installation, E-SW, SW and documentation, 6 languages, executable under Windows 10 (64-bit), Windows 11 (64-bit), Mac OS 11 Big Sur, 12.1, Monterey, 13.6 Ventura, 14.5 Sonoma, 15 Sequoia. Linux SUSE: tested SUSE Linux 15 (64-bit), Kylin Desktop V10 SP1	**6ED1058-0BA08-0YA3**
LOGO! Soft Comfort V9 DL download Single license for 1 installation, E-SW, SW and documentation, 6 languages, executable under Windows 10 (64-bit), Windows 11 (64-bit), Mac OS 11 Big Sur, 12.1, Monterey, 13.6 Ventura, 14.5 Sonoma, 15 Sequoia. Linux: Tested with SUSE Linux 15 (64-bit), Kylin OS Consignee email address required for delivery.	**6ED1058-0BA10-0YA3**

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Overview



There are now three LOGO! 8 Starter Kits for price-conscious beginners – each individually configured for the specific requirements.

- LOGO! Starter Kit 12/24RCE;
  With LOGO! 12/24RCE, power supply, screwdriver, in Systainer
- LOGO! Starter Kit 230 RCE;
  With LOGO! 230RCE, power supply, screwdriver, in Systainer
- LOGO! Starter Kit 12/24 V;
  With LOGO! 12/24RCEO, LOGO! TD, power supply, screwdriver, in Systainer

With these low-cost complete packages, users can familiarize themselves quickly and easily with the advantages and possibilities of the logic module. LOGO! has been used successfully for many years in industry and trade throughout the world. It solves switching and control tasks conveniently and cost-effectively.

Selection and ordering data

LOGO! Starter Kits	
LOGO! Starter Kit 12/24RCE V8.3 With LOGO! 12/24RCE, LOGO! Soft Comfort, WinCC Basic, power supply, screwdriver, in Systainer	**6ED1057-4BA01-0AA0**
LOGO! Starter Kit 230RCE V8.3 With LOGO! 230RCE, LOGO! Soft Comfort, WinCC Basic, screwdriver in Systainer	**6ED1057-4BA03-0AA0**
LOGO! TD Starter Kit 12/24 V8.3 With LOGO! TD, LOGO! 12/24RCEo, LOGO! Soft Comfort, power supply, WinCC Basic, screwdriver in Systainer	**6ED1057-4BA11-0AA0**

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Overview



LOGO! 9 TDE touch display



LOGO! TDE text display

- Low-cost and central operating interface for applications
- Can be used for parameter adjustments and troubleshooting
- Permits the display of all messages via the integrated web server and thus also the control of applications via a smartphone
- Two Ethernet interfaces to connect to a basic module, PC, or other LOGO! TDE

Selection and ordering data

LOGO! TD text display 6 lines, 3 background colors, 2 Ethernet ports, mounting accessories; for LOGO! 8	**6ED1055-4MH08-0BA1**
LOGO! 9 TDE touch display 256 colors, 2 Ethernet ports, mounting accessories; for LOGO! 9	**6ED1055-4MH08-0BA3**

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Technical specifications

Article number	6ED1055-4MH08-0BA1 LOGO! TD Textdisplay, 6 Lines	6ED1055-4MH08-0BA3 LOGO! 9 TDE Touch display
General information		
Product type designation	Text display	touch display
Suitability for use	Can be used with LOGO! 8 and higher	can be used with LOGO! 9 and higher
Display		
Design of display	FSTN	touch display
Line display		
• Number of lines	6	
• Number of characters per line	20	
Resolution (pixels)		
• Horizontal image resolution		480 pixel
• Vertical image resolution		272 pixel
Backlighting		
• Type of backlighting	LED	
Control elements		
Keyboard		
• System keys	Yes	Yes
- Number of configurable system keys	0	
• alphanumeric keyboard	No	No
Installation type/mounting		
Wall mounting/direct mounting	No	No
Supply voltage		
Type of supply voltage	AC/DC	AC/DC
Rated value (DC)	12 V; 12/24 V DC, 24 V AC	12 V; 12/24 V DC, 24 V AC
Power loss		
Power loss, typ.	1.8 W; At 24 V DC	1.92 W; At 24 V DC
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Degree and class of protection		
IP (at the front)	IP65	IP65
IP (rear)		IP20
Standards, approvals, certificates		
CE mark	Yes	Yes
UL approval	Yes	Yes
FM approval	Yes	Yes
KC approval	Yes	Yes
Marine approval		
• American Bureau of Shipping (ABS)	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Configuration		
Configuration software		
• Configuration tool	LOGO! Soft Comfort V8	LOGO! Soft Comfort V9 or higher
Accessories		
belongs to product	LOGO!	LOGO! 9
Mechanics/material		
Design of housing	plastic	plastic

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Technical specifications (continued)

Article number	6ED1055-4MH08-0BA1 LOGO! TD Textdisplay, 6 Lines	6ED1055-4MH08-0BA3 LOGO! 9 TDE Touch display
Dimensions		
Width	128.2 mm	128.2 mm
Height	86 mm	86 mm
Depth	38.7 mm	38.7 mm
Mounting cutout, width		119 mm; Tolerance +0.5 mm
Mounting cutout, height		78.5 mm; Tolerance +0.5 mm
mounting depth	38.7 mm	
Weights		
Weight, approx.	220 g	205 g

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Overview



• Switching module for direct switching of resistive load and motors.

Selection and ordering data

LOGO!Contact Switching module for direct switching of resistive loads up to 20 A and motors up to 4 kW	
LOGO!Contact 24 switching module For direct switching of resistive loads up to 20 A and motors up to 4 kW, 24 V DC, 3 NO contacts+1 NC contact EAN: 4025515050742	**6ED1057-4CA00-0AA0**
LOGO!Contact 230 switching module For direct switching of resistive loads up to 20 A and motors up to 4 kW, 230 V AC, 3 NO contacts+1 NC contact EAN: 4025515050759	**6ED1057-4EA00-0AA0**

Technical specifications

Article number	6ED1057-4CA00-0AA0 LOGO! Contact Mod., DC 24V, 3NO/1NC	6ED1057-4EA00-0AA0 LOGO! Contact Mod., AC 230V,3NO/1NC
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	
Rated value (AC)		
• 230 V AC		Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Dimensions		
Width	36 mm	36 mm
Height	72 mm	72 mm
Depth	55 mm	55 mm
Weights		
Weight, approx.	160 g	160 g

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Overview



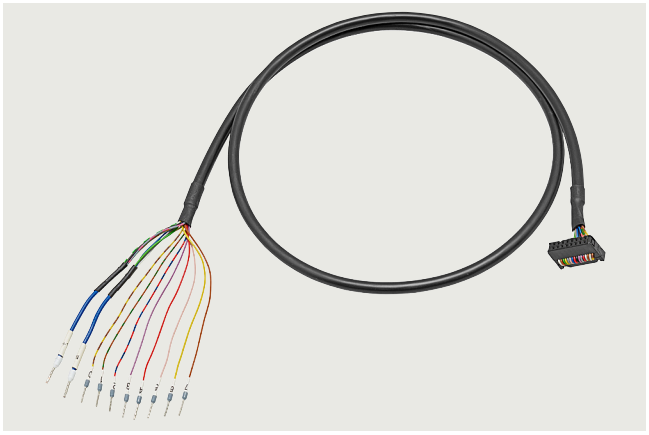
LOGO! and SIPLUS LOGO! are designed for quick and easy DIN rail mounting. With the mounting kit, these devices can also be easily and safely installed in front panels. If the supplied washer and seals are used, the devices are reliably protected against harsh environmental conditions up to the degree of protection IP65.

Selection and ordering data

Front panel mounting kit	
Width 4 U, with keys	**6AG1057-1AA00-0AA3**
Width 8 U, with keys	**6AG1057-1AA00-0AA2**

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Overview



SIMATIC TOP connect universal connecting cable

The wiring of the

- SIMATIC S7-1500 IO (25 mm)
- SIMATIC ET 200SP
- SIMATIC S7-1200
- LOGO!

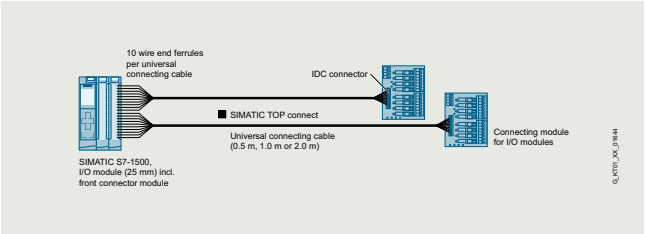
with the sensors/actuators is a significant factor with respect to time/cost overhead during configuration, control cabinet design, procurement and ease of servicing. The SIMATIC TOP connect system cabling makes connection easy, fast and secure.

Design

The unshielded universal connection cable is offered for a wide range of control cabinet concepts.

It comprises:

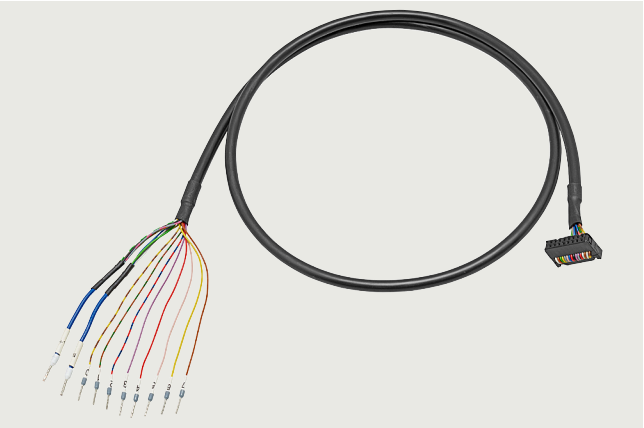
- 16-pin round cable with a core cross-section of 0.14 mm^2, pre-assembled with wire end ferrules for connection to the controller:
  - Labeled with "0" ... "7" for the control inputs/outputs
  - Labeled with "M" for mass
  - Labeled with "L+" for 24 V DC potential
- 16-pin ID (insulation displacement) connector for connection to the SIMATIC TOP connect connection modules for 8 I/Os:
  - 3-wire connection using the appropriate connection module for quick, error-free wiring
  - Galvanic isolation and adaptation using a coupling relay for easy implementation of potential groups in the system
  - High output current (up to 4 A), even for higher switching frequencies, using an optocoupler module (overload and short-circuit proof)
  - Implementation of isolating terminals using switch modules enabling individual signals to be measured
  - Channel-wise protection of I/Os using a fuse module with a thermal fuse



SIMATIC TOP connect universal connection cable

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Overview



SIMATIC TOP connect universal connecting cable

The universal connecting cable constitutes the link between the standard connection of the SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 or LOGO! and the SIMATIC TOP connect terminal module. It transmits 8 signals and the supply voltage. The connecting cable is available in lengths of 0.5 m / 1.0 m / 2.0 m. the maximum technically feasible length is 30 m.

Selection and ordering data

Designation	Article No.
Universal connecting cables for SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 and LOGO!	
16 x 0.14 mm² unshielded	
• 0.5 m	**6ES7923-0BA50-0FB0**
• 1.0 m	**6ES7923-0BB00-0FB0**
• 2.0 m	**6ES7923-0BC00-0FB0**

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Overview

The connection modules are used instead of conventional terminal blocks and act as the interface between the PLC and signals from the field. All digital modules with 8 I/Os can be used.

Selection and ordering data

TP1 connection module	
For 1-conductor connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0AA20-0BA0**
TP3 connection module	
For 3-conductor connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0CA20-0BA0**
• Push-in terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BC0**
• Screw-type terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BA0**
• Push-in terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BA0**
TPRo connection module	
Relay module for 8 outputs, relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BD20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BD20-0BA0**
TPRi connection module	
Relay module for 8 inputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
TPRi connection module	
Relay module for 8 inputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**
TPOo connection module	
Optocoupler module for 8 outputs (max. 24 V DC/4 A)	
• Push-in terminals with LEDs	**6ES7924-0BF20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BF20-0BA0**

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Overview



SIMATIC S7-1200 Controllers are the intelligent choice for compact automation solutions with integrated IOs, communication functions and technology functions for automation tasks in the lower to middle performance range. They are available in standard and fail-safe versions.

The scalable SIMATIC S7-1200 Controllers have integrated inputs and outputs as well as communication options and allow modular expansion. Digital and analog input and output modules as well as different communications and special modules enable flexible adaptation to the relevant automation task.

Technical specifications

General technical specifications	
Degree of protection	IP20 acc. to IEC 529
Ambient temperature	
• Operation (95% humidity)	
- Horizontal installation	-20 ... +60 °C
- Vertical installation	-20 ... +50 °C
• Transportation and storage	-40 ... +70 °C
- With 95% humidity	25 ... 55 °C
Insulation	
• 5/24 V DC circuits	500 V AC test voltage
• 115/230 V AC circuits to ground	1500 V AC test voltage
• 115/230 V AC circuits to 115/230 V AC circuits	1500 V AC test voltage
• 230 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
• 115 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
Electromagnetic compatibility	Requirements of the EMC directive
• Noise immunity acc. to EN 50082-2	Test acc. to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160
• Emitted interference acc. to EN 50081-1 and EN 50081-2	Test according to EN 55011, Class A, Group 1
Mechanical strength	
• Vibrations, test acc. to / tested with	IEC 68, Part 2-6: 10 ... 57 Hz; constant amplitude 0.3 mm; 58 ... 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in switchboard); mode of vibration: frequency sweeps with a sweep rate of 1 octave/minute; duration of vibration: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes
• Shocks, test acc. to / tested with	IEC 68, Part 2-27/half-sine: magnitude of shock 15 g (peak value), duration 11 ms, 6 shocks in each of the three mutually perpendicular axes

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Technical specifications

General technical specifications of SIPLUS S7-1200	
Ambient temperature range	-40/-25/-20 ... +55/+60/+70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions.
Ambient conditions	
Extended range of ambient conditions	

• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) //
	Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) //
	Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)

• At cold restart, min.	0° C
Relative humidity	
• with condensation, max.	100 %; RH incl. condensation/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

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Overview



- Controller for intro to S7
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - Max. 3 communications modules (CM)

Selection and ordering data

CPU 1211C	
SIMATIC S7-1200, CPU 1211C, compact CPU, AC/DC/relay Onboard I/O: 6 DI 24 V DC; 4 DO relay 2 A; 2 AI 0-10 V DC, power supply: 85-264 V AC at 47-63 Hz, program/data memory 75 KB	**6ES7211-1BE40-0XB0**
SIMATIC S7-1200, CPU 1211C, compact CPU, DC/DC/DC Onboard I/O: 6 DI 24 V DC; 4 DO 24 V DC; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 75 KB	**6ES7211-1AE40-0XB0**
SIMATIC S7-1200, CPU 1211C, compact CPU, DC/DC/relay Onboard I/O: 6 DI 24 V DC; 4 DO relay 2 A; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 75 KB	**6ES7211-1HE40-0XB0**
Accessories	
SB 1221 signal board	
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 5 V DC 200 kHz, sourcing input	**6ES7221-3AD30-0XB0**
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 24 V DC 200 kHz, sourcing input	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 5 V DC 200 kHz	**6ES7222-1AD30-0XB0**
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 24 V DC 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DO, 2 DI 24 V DC/2 DO 24 V DC	**6ES7223-0BD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 5 V DC 200 kHz	**6ES7223-3AD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 24 V DC 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	
SIMATIC S7-1200, analog input, SB 1231 1 AI, +/-10 V DC (12-bit resolution) or 0-20 mA	**6ES7231-4HA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231 TC 1 AI type J or K thermocouples	**6ES7231-5QA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231 RTD 1 AI RTD, PT 100 and PT1000	**6ES7231-5PA30-0XB0**
SIMATIC S7-1200, analog output, SB 1232 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HA30-0XB0**
SIMATIC S7-1200, CB 1241 communication board RS-485, terminal block, supports Freeport	**6ES7241-1CH30-1XB0**
SIMATIC S7-1200, BB 1297 battery board For long-term buffering of the real-time clock, pluggable in the signal board slot of the S7-12XX (from FW3.0); battery (CR1025) not included in scope of supply	**6ES7297-0AX30-0XA0**
SIMATIC S7-1200, SIM 1274 simulator module For CPU 1211/1212 8 input switches 24 V DC	**6ES7274-1XF30-0XA0**
SIMATIC S7-1200, SIM 1274 analog simulator 2 potentiometer inputs	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**

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Selection and ordering data (continued)

SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
Terminal block (spare part)	
For CPU 1211C AC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1211C/1212C on input side, (4 units with 14 screws each)	**6ES7292-1AP40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for CPU 1211C/1212C on input side, (4 units with 14 pins each)	**6ES7292-2AP40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1211C/1212C on output side, (4 units with 8 screws each)	**6ES7292-1AH40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, CPU 1211C/1212C on output side, (4 units with 8 pins each)	**6ES7292-2AH40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
For CPU 1211C DC/DC/DC	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1211C/1212C on input side (4 units with 14 screws each)	**6ES7292-1AP30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1211C/1212C on input side, (4 units with 14 pins each)	**6ES7292-2AP30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1211C/1212C on output side (4 units with 8 screws each)	**6ES7292-1AH30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1211C/1212C on output side, (4 units with 8 pins each)	**6ES7292-2AH30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
For CPU 1211C DC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1211C/1212C on input side (4 units with 14 screws each)	**6ES7292-1AP30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1211C/1212C on input side, (4 units with 14 pins each)	**6ES7292-2AP30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1211C/1212C on output side, (4 units with 8 screws each)	**6ES7292-1AH40-0XA0**

Selection and ordering data (continued)

SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, CPU 1211C/1212C on output side, (4 units with 8 pins each)	**6ES7292-2AH40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
SIMATIC S7-1200, RJ45 strain relief Single port 4 units per packing unit	**6ES7290-3AA30-0XA0**
SIMATIC S7-1200, spare part front flaps CPU 1211/1212 (CPU 1211/1212 front flap top/front flap bottom/signal board cover) 4 units each	**6ES7291-1AA30-0XA0**
STEP 7 Professional / Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery**: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-0AA25-0YA5**

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Selection and ordering data (continued)

SIMATIC STEP 7 Basic V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels; The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

1) Up-to-date information and download availability can be found at this link.

Technical specifications

Article number	6ES7211-1BE40-0XB0 CPU 1211C, AC/DC/Relay, 6DI/4DO/2AI	6ES7211-1AE40-0XB0 CPU 1211C, DC/DC/DC, 6DI/4DO/2AI	6ES7211-1HE40-0XB0 CPU 1211C, DC/DC/Relay, 6DI/4DO/2AI
General information			
Product type designation	CPU 1211C AC/DC/relay	CPU 1211C DC/DC/DC	CPU 1211C DC/DC/relay
Engineering with			
• Programming package	STEP 7 V20 or higher	STEP 7 V20 or higher	STEP 7 V20 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Storage			
Work memory			
• Integrated	75 kbyte	75 kbyte	75 kbyte
Load memory			
• Integrated	1 Mbyte	1 Mbyte	1 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	6; Integrated	6; Integrated	6; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	4; Relays	4	4; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0

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Technical specifications (continued)

Article number	6ES7211-1BE40-0XB0 CPU 1211C, AC/DC/Relay, 6DI/4DO/2AI	6ES7211-1AE40-0XB0 CPU 1211C, DC/DC/DC, 6DI/4DO/2AI	6ES7211-1HE40-0XB0 CPU 1211C, DC/DC/Relay, 6DI/4DO/2AI
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	1	1	1
• integrated switch	No	No	No
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; Data access (read, write, subscribe), runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6ES7211-1BE40-0XB0 CPU 1211C, AC/DC/Relay, 6DI/4DO/2AI	6ES7211-1AE40-0XB0 CPU 1211C, DC/DC/DC, 6DI/4DO/2AI	6ES7211-1HE40-0XB0 CPU 1211C, DC/DC/Relay, 6DI/4DO/2AI
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	420 g	370 g	380 g

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Overview



- Controller for intro to S7 with basic expansion options
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 2 signal modules (SM)
  - Max. 3 communications modules (CM)

Selection and ordering data

CPU 1212C	
SIMATIC S7-1200, CPU 1212C, compact CPU, AC/DC/relay Onboard I/O: 8 DI 24 V DC; 6 DO relay 2 A; 2 AI 0-10 V DC, power supply: 85-264 V AC at 47-63 Hz, program/data memory 100 KB	**6ES7212-1BE40-0XB0**
SIMATIC S7-1200, CPU 1212C, compact CPU, DC/DC/DC Onboard I/O: 8 DI 24 V DC; 6 DO 24 V DC; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 100 KB	**6ES7212-1AE40-0XB0**
SIMATIC S7-1200, CPU 1212C, compact CPU, DC/DC/relay* Onboard I/O: 8 DI 24 V DC; 6 DO relay 2 A; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 100 KB	**6ES7212-1HE40-0XB0**
Accessories	
SB 1221 signal board	
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 5 V DC 200 kHz, sourcing input	**6ES7221-3AD30-0XB0**
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 24 V DC 200 kHz, sourcing input	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 5 V DC 200 kHz	**6ES7222-1AD30-0XB0**
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 24 V DC 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DO, 2 DI 24 V DC/2 DO 24 V DC	**6ES7223-0BD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 5 V DC 200 kHz	**6ES7223-3AD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 24 V DC 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	
SIMATIC S7-1200, analog input, SB 1231 1 AI, +/-10 V DC (12-bit resolution) or 0-20 mA	**6ES7231-4HA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231 TC 1 AI type J or K thermocouples	**6ES7231-5QA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231RTD 1 AI RTD, PT 100 and PT1000	**6ES7231-5PA30-0XB0**
SIMATIC S7-1200, analog output, SB 1232 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HA30-0XB0**
SIMATIC S7-1200, CB 1241 communication board RS-485, terminal block, supports Freeport	**6ES7241-1CH30-1XB0**
SIMATIC S7-1200, BB 1297 battery board For long-term buffering of the real-time clock, pluggable in the signal board slot of the S7-12XX (from FW3.0); battery (CR1025) not included in scope of supply	**6ES7297-0AX30-0XA0**
SIMATIC S7-1200, SIM 1274 simulator module For CPU 1211/1212 8 input switches 24 V DC	**6ES7274-1XF30-0XA0**
SIMATIC S7-1200, SIM 1274 analog simulator 2 potentiometer inputs	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**

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Selection and ordering data (continued)

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1200, extension cable 2-tier setup for SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part)	
For CPU 1212C AC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1211C/1212C on input side, (4 units with 14 screws each)	**6ES7292-1AP40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for CPU 1211C/1212C on input side, (4 units with 14 pins each)	**6ES7292-2AP40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1211C/1212C on output side, (4 units with 8 screws each)	**6ES7292-1AH40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, CPU 1211C/1212C on output side, (4 units with 8 pins each)	**6ES7292-2AH40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
For CPU 1212C DC/DC/DC	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1211C/1212C on input side (4 units with 14 screws each)	**6ES7292-1AP30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1211C/1212C on input side, (4 units with 14 pins each)	**6ES7292-2AP30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1211C/1212C on output side (4 units with 8 screws each)	**6ES7292-1AH30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1211C/1212C on output side, (4 units with 8 pins each)	**6ES7292-2AH30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
For CPU 1212C DC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1211C/1212C on input side (4 units with 14 screws each)	**6ES7292-1AP30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1211C/1212C on input side, (4 units with 14 pins each)	**6ES7292-2AP30-0XA0**

Selection and ordering data (continued)

SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1211C/1212C on output side, (4 units with 8 screws each)	**6ES7292-1AH40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, CPU 1211C/1212C on output side, (4 units with 8 pins each)	**6ES7292-2AH40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
SIMATIC S7-1200, RJ45 strain relief Single port 4 units per packing unit	**6ES7290-3AA30-0XA0**
SIMATIC S7-1200, spare part front flaps CPU 1211/1212 (CPU 1211/1212 front flap top/front flap bottom/signal board cover) 4 units each	**6ES7291-1AA30-0XA0**
STEP 7 Professional / Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-0AA25-0YA5**

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Selection and ordering data (continued)

SIMATIC STEP 7 Basic V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

1) Up-to-date information and download availability can be found at this link.

Technical specifications

Article number	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	6ES7212-1AE40-0XB0 CPU 1212C ,DC/DC/DC, 8DI/6DO/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
General information			
Product type designation	CPU 1212C AC/DC/relay	CPU 1212C DC/DC/DC	CPU 1212C DC/DC/relay
Engineering with			
• Programming package	STEP 7 V20 or higher	STEP 7 V20 or higher	STEP 7 V20 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Storage			
Work memory			
• integrated	100 kbyte	100 kbyte	100 kbyte
Load memory			
• Integrated	2 Mbyte	2 Mbyte	2 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	8; Integrated	8; Integrated	8; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	6; Relays	6	6; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0

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Technical specifications (continued)

Article number	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	6ES7212-1AE40-0XB0 CPU 1212C ,DC/DC/DC, 8DI/6DO/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	1	1	1
• integrated switch	No	No	No
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

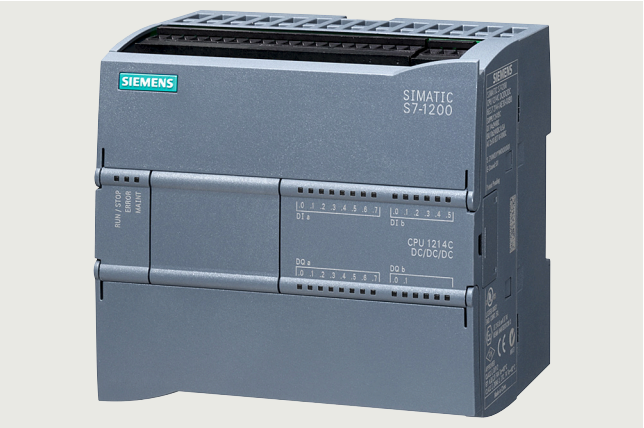
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Technical specifications (continued)

Article number	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	6ES7212-1AE40-0XB0 CPU 1212C ,DC/DC/DC, 8DI/6DO/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	425 g	370 g	385 g

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Overview



- Controller for intro to S7 with flexible expansion options
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

Selection and ordering data

CPU 1214C	
SIMATIC S7-1200, CPU 1214C, compact CPU, AC/DC/relay Onboard I/O: 14 DI 24 V DC; 10 DO relay 2 A; 2 AI 0-10 V DC, power supply: 85-264 V AC at 47-63 Hz, program/data memory 150 KB	**6ES7214-1BG40-0XB0**
SIMATIC S7-1200, CPU 1214C, compact CPU, DC/DC/DC Onboard I/O: 14 DI 24 V DC; 10 DO 24 V DC; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 150 KB	**6ES7214-1AG40-0XB0**
SIMATIC S7-1200, CPU 1214C, compact CPU, DC/DC/relay Onboard I/O: 14 DI 24 V DC; 10 DO relay 2 A; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 150 KB	**6ES7214-1HG40-0XB0**
Accessories	
SB 1221 signal board	
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 5 V DC 200 kHz, sourcing input	**6ES7221-3AD30-0XB0**
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 24 V DC 200 kHz, sourcing input	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 5 V DC 200 kHz	**6ES7222-1AD30-0XB0**
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 24 V DC 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DO, 2 DI 24 V DC/2 DO 24 V DC	**6ES7223-0BD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 5 V DC 200 kHz	**6ES7223-3AD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 24 V DC 200 kHz	**6ES7223-3BD30-0XB0**
SIMATIC S7-1200, analog input, SB 1231 1 AI, +/-10 V DC (12-bit resolution) or 0-20 mA	**6ES7231-4HA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231 TC 1 AI type J or K thermocouples	**6ES7231-5QA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231RTD 1 AI RTD, PT 100 and PT1000	**6ES7231-5PA30-0XB0**
SIMATIC S7-1200, analog output, SB 1232 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HA30-0XB0**
SIMATIC S7-1200, CB 1241 communication board RS-485, terminal block, supports Freeport	**6ES7241-1CH30-1XB0**
SIMATIC S7-1200, BB 1297 battery board For long-term buffering of the real-time clock, pluggable in the signal board slot of the S7-12XX (from FW3.0); battery (CR1025) not included in scope of supply	**6ES7297-0AX30-0XA0**
SIMATIC S7-1200, SIM 1274 simulator module For CPU 1214/1215 14 input switches 24 V DC	**6ES7274-1XH30-0XA0**
SIMATIC S7-1200, SIM 1274 analog simulator 2 potentiometer inputs	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**

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Selection and ordering data (continued)

SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part)	
For CPU 1214C AC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1214C/1215C on input side, (4 units with 20 screws each)	**6ES7292-1AV40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for CPU 1214C/1215C on input side, (4 units with 20 pins each)	**6ES7292-2AV40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1214C/1215C on output side, (4 units with 12 screws each)	**6ES7292-1AM40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for CPU 1214C/1215C on output side, (4 units with 12 pins each)	**6ES7292-2AM40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
For CPU 1214C DC/DC/DC	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on input side (4 units with 20 screws each)	**6ES7292-1AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology for CPU 1214C/1215C on input side (4 units with 20 pins each)	**6ES7292-2AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on output side (4 units with 12 screws each)	**6ES7292-1AM30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1214C/1215C on output side (4 units with 12 pins each)	**6ES7292-2AM30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
For CPU 1214C DC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on input side (4 units with 20 screws each)	**6ES7292-1AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology for CPU 1214C/1215C on input side (4 units with 20 pins each)	**6ES7292-2AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1214C/1215C on output side, (4 units with 12 screws each)	**6ES7292-1AM40-0XA0**

Selection and ordering data (continued)

SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for CPU 1214C/1215C on output side, (4 units with 12 pins each)	**6ES7292-2AM40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for analog inputs CPU 1211C/1212C/1214C, (4 units with 3 pins each)	**6ES7292-2BC30-0XA0**
SIMATIC S7-1200, RJ45 strain relief Single port 4 units per packing unit	**6ES7290-3AA30-0XA0**
SIMATIC S7-1200, spare part front flaps CPU 1214 (CPU 1214 front flap top/front flap bottom/signal board cover) 4 units each	**6ES7291-1AB30-0XA0**
STEP 7 Professional / Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading1); Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-0AA25-0YA5**

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Selection and ordering data (continued)

SIMATIC STEP 7 Basic V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

1) Up-to-date information and download availability can be found at this link.

Technical specifications

Article number	6ES7214-1BG40-0XB0 CPU 1214C, AC/DC/Relay, 14DI/10DO/2AI	6ES7214-1AG40-0XB0 CPU 1214C, DC/DC/DC, 14DI/10DO/2AI	6ES7214-1HG40-0XB0 CPU 1214C, DC/DC/Relay, 14DI/10DO/2AI
General information			
Product type designation	CPU 1214C AC/DC/relay	CPU 1214C DC/DC/DC	CPU 1214C DC/DC/relay
Engineering with			
• Programming package	STEP 7 V20 or higher	STEP 7 V20 or higher	STEP 7 V20 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Storage			
Work memory			
• integrated	150 kbyte	150 kbyte	150 kbyte
Load memory			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; Relays	10	10; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0

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Technical specifications (continued)

Article number	6ES7214-1BG40-0XB0 CPU 1214C, AC/DC/Relay, 14DI/10DO/2AI	6ES7214-1AG40-0XB0 CPU 1214C, DC/DC/DC, 14DI/10DO/2AI	6ES7214-1HG40-0XB0 CPU 1214C, DC/DC/Relay, 14DI/10DO/2AI
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	1	1	1
• integrated switch	No	No	No
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6ES7214-1BG40-0XB0 CPU 1214C, AC/DC/Relay, 14DI/10DO/2AI	6ES7214-1AG40-0XB0 CPU 1214C, DC/DC/DC, 14DI/10DO/2AI	6ES7214-1HG40-0XB0 CPU 1214C, DC/DC/Relay, 14DI/10DO/2AI
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	455 g	415 g	435 g

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Overview



- Powerful controller with enhanced networking option
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

Selection and ordering data

CPU 1215C	
SIMATIC S7-1200, CPU 1215C, compact CPU, AC/DC/relay 2 PROFINET ports, onboard I/O: 14 DI 24 V DC; 10 DO relay 2 A, 2 AI 0-10 V DC, 2 AO 0-20 mA DC, power supply: 85-264 V AC at 47-63 Hz, program/data memory 200 KB	**6ES7215-1BG40-0XB0**
SIMATIC S7-1200, CPU 1215C, compact CPU, DC/DC/DC 2 PROFINET ports, onboard I/O: 14 DI 24 V DC; 10 DO 24 V DC; 0.5 A; 2 AI 0-10 V DC, 2 AO 0-20 mA DC, power supply: 20.4-28.8 V DC, program/data memory 200 KB	**6ES7215-1AG40-0XB0**
SIMATIC S7-1200, CPU 1215C, compact CPU, DC/DC/relay 2 PROFINET ports, onboard I/O: 14 DI 24 V DC; 10 DO relay 2 A, 2 AI 0-10 V DC, 2 AO 0-20 mA DC, power supply: 20.4-28.8 V DC, program/data memory 200 KB	**6ES7215-1HG40-0XB0**
Accessories	
SB 1221 signal board	
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 5 V DC 200 kHz, sourcing input	**6ES7221-3AD30-0XB0**
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 24 V DC 200 kHz, sourcing input	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 5 V DC 200 kHz	**6ES7222-1AD30-0XB0**
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 24 V DC 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DO, 2 DI 24 V DC/2 DO 24 V DC	**6ES7223-0BD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 5 V DC 200 kHz	**6ES7223-3AD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 24 V DC 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	
SIMATIC S7-1200, analog input, SB 1231 1 AI, +/-10 V DC (12-bit resolution) or 0-20 mA	**6ES7231-4HA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231 TC, 1 AI type J or K thermocouples	**6ES7231-5QA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231RTD 1 AI RTD, PT 100 and PT1000	**6ES7231-5PA30-0XB0**
SB 1232 signal board	
SIMATIC S7-1200, analog output, SB 1232 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HA30-0XB0**
SIMATIC S7-1200, CB 1241 communication board RS-485, terminal block, supports Freeport	**6ES7241-1CH30-1XB0**
SIMATIC S7-1200, BB 1297 battery board For long-term buffering of the real-time clock, pluggable in the signal board slot of the S7-12XX (from FW3.0); battery (CR1025) not included in scope of supply	**6ES7297-0AX30-0XA0**
SIMATIC S7-1200, SIM 1274 simulator module For CPU 1214/1215 14 input switches 24 V DC	**6ES7274-1XH30-0XA0**
SIMATIC S7-1200, SIM 1274 analog simulator 2 potentiometer inputs	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**

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Selection and ordering data (continued)

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part)	
For CPU 1215C AC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1214C/1215C on input side, (4 units with 20 screws each)	**6ES7292-1AV40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for CPU 1214C/1215C on input side, (4 units with 20 pins each)	**6ES7292-2AV40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1214C/1215C on output side, (4 units with 12 screws each)	**6ES7292-1AM40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for CPU 1214C/1215C on output side, (4 units with 12 pins each)	**6ES7292-2AM40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block Analog signals CPU 1215C/1217C, (4 units with 6 screws each)	**6ES7292-1BF30-0XB0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for analog signals CPU 1215C/1217C, (4 units with 6 pins each)	**6ES7292-2BF30-0XB0**
For CPU 1215C DC/DC/DC	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on input side (4 units with 20 screws each)	**6ES7292-1AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology for CPU 1214C/1215C on input side (4 units with 20 pins each)	**6ES7292-2AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on output side (4 units with 12 screws each)	**6ES7292-1AM30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1214C/1215C on output side (4 units with 12 pins each)	**6ES7292-2AM30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block Analog signals CPU 1215C/1217C, (4 units with 6 screws each)	**6ES7292-1BF30-0XB0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for analog signals CPU 1215C/1217C, (4 units with 6 pins each)	**6ES7292-2BF30-0XB0**
For CPU 1215C DC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on input side (4 units with 20 screws each)	**6ES7292-1AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology for CPU 1214C/1215C on input side (4 units with 20 pins each)	**6ES7292-2AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1214C/1215C on output side, (4 units with 12 screws each)	**6ES7292-1AM40-0XA0**

Selection and ordering data (continued)

SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for CPU 1214C/1215C on output side, (4 units with 12 pins each)	**6ES7292-2AM40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block Analog signals CPU 1215C/1217C, (4 units with 6 screws each)	**6ES7292-1BF30-0XB0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for analog signals CPU 1215C/1217C, (4 units with 6 pins each)	**6ES7292-2BF30-0XB0**
SIMATIC S7-1200, spare part front flaps CPU 1215C (CPU 1215C front flap top/front flap bottom/signal board cover) 4 units each	**6ES7291-1AC30-0XA0**
SIMATIC S7-1200, RJ45 strain relief Dual port 4 units per packing unit	**6ES7290-3AB30-0XA0**
STEP 7 Professional / Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-0AA25-0YA5**
SIMATIC STEP 7 Basic V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading; Class A; for configuring SIMATIC S7-1200; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7215-1BG40-0XB0 CPU 1215C, AC/DC/RLY, 14DI/10DO/2AI/2AO	6ES7215-1AG40-0XB0 CPU 1215C, DC/DC/DC, 14DI/10DO/2AI/2AO	6ES7215-1HG40-0XB0 CPU 1215C, DC/DC/RLY, 14DI/10DO/2AI/2AO
General information			
Product type designation	CPU 1215C AC/DC/relay	CPU 1215C DC/DC/DC	CPU 1215C DC/DC/relay
Engineering with			
• Programming package	STEP 7 V20 or higher	STEP 7 V20 or higher	STEP 7 V20 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Storage			
Work memory			
• Integrated	200 kbyte	200 kbyte	200 kbyte
Load memory			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; Relays	10	10; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	2	2	2
Output ranges, current			
• 0 to 20 mA	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7215-1BG40-0XB0 CPU 1215C, AC/DC/RLY, 14DI/10DO/2AI/2AO	6ES7215-1AG40-0XB0 CPU 1215C, DC/DC/DC, 14DI/10DO/2AI/2AO	6ES7215-1HG40-0XB0 CPU 1215C, DC/DC/RLY, 14DI/10DO/2AI/2AO
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6ES7215-1BG40-0XB0 CPU 1215C, AC/DC/RLY, 14DI/10DO/2AI/2AO	6ES7215-1AG40-0XB0 CPU 1215C, DC/DC/DC, 14DI/10DO/2AI/2AO	6ES7215-1HG40-0XB0 CPU 1215C, DC/DC/RLY, 14DI/10DO/2AI/2AO
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	130 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	550 g	500 g	585 g

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Overview



- Powerful controller for extremely fast signal processing
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

Selection and ordering data

CPU 1217C	
SIMATIC S7-1200, CPU 1217C, compact CPU, DC/DC/DC 2 PROFINET ports onboard I/O: 10 DI 24 V DC; 4 DI RS-422/485; 6 DO 24 V DC; 0.5 A; 4 DO RS-422/485; 2 AI 0-10 V DC, 2 AO 0-20 mA power supply: 20.4-28.8 V DC, program/data memory 250 KB	**6ES7217-1AG40-0XB0**
Accessories	
SB 1221 signal board	
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 5 V DC 200 kHz, sourcing input	**6ES7221-3AD30-0XB0**
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 24 V DC 200 kHz, sourcing input	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 5 V DC 200 kHz	**6ES7222-1AD30-0XB0**
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 24 V DC 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DO, 2 DI 24 V DC/2 DO 24 V DC	**6ES7223-0BD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 5 V DC 200 kHz	**6ES7223-3AD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 24 V DC 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	
SIMATIC S7-1200, analog input, SB 1231 1 AI, +/-10 V DC (12-bit resolution) or 0-20 mA	**6ES7231-4HA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231 TC 1 AI type J or K thermocouples	**6ES7231-5QA30-0XB0**
SIMATIC S7-1200, analog input, SB 1231RTD 1 AI RTD, PT 100 and PT1000	**6ES7231-5PA30-0XB0**
SIMATIC S7-1200, analog output, SB 1232 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HA30-0XB0**
SIMATIC S7-1200, CB 1241 communication board RS-485, terminal block, supports Freeport	**6ES7241-1CH30-1XB0**
SIMATIC S7-1200, BB 1297 battery board For long-term buffering of the real-time clock, pluggable in the signal board slot of the S7-12XX (from FW3.0); battery (CR1025) not included in scope of supply	**6ES7297-0AX30-0XA0**
SIMATIC S7-1200, SIM 1274 simulator module For CPU 1217C, 14 input switches, 10x 24 V DC inputs, 4x 1.5 V differential inputs	**6ES7274-1XK30-0XA0**
SIMATIC S7-1200, SIM 1274 analog simulator 2 potentiometer inputs	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**

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Selection and ordering data (continued)

SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part)	
For CPU 1217C	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1217C on input side (4 units with 10 screws each)	**6ES7292-1AK30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1217C on input side (4 units with 10 pins each)	**6ES7292-2AK30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1217C on input side (4 units with 16 screws each)	**6ES7292-1AR30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1217C on input side (4 units with 16 pins each)	**6ES7292-2AR30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1217C on output side (4 units with 18 screws each)	**6ES7292-1AT30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for CPU 1217C on output side (4 units with 18 pins each)	**6ES7292-2AT30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block Analog signals CPU 1215C/1217C, (4 units with 6 screws each)	**6ES7292-1BF30-0XB0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for analog signals CPU 1215C/1217C, (4 units with 6 pins each)	**6ES7292-2BF30-0XB0**
SIMATIC S7-1200, spare part front flaps CPU 1217C (CPU 1217C front flap top/front flap bottom/signal board cover) 4 units each	**6ES7291-1AD30-0XA0**
SIMATIC S7-1200, RJ45 strain relief Dual port 4 units per packing unit	**6ES7290-3AB30-0XA0**
STEP 7 Professional / Basic V20 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional 21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**

Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-0AA25-0YA5**
SIMATIC STEP 7 Basic V25, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading; Class A; for configuring SIMATIC S7-1200; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7217-1AG40-0XB0 CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
General information	
Product type designation	CPU 1217C DC/DC/DC
Engineering with	
• Programming package	STEP 7 V20 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Storage	
Work memory	
• integrated	250 kbyte
Load memory	
• Integrated	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card
CPU processing times	
for bit operations, typ.	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / Operation
Data areas and their retentivity	
Flag	
• Size, max.	8 kbyte; Size of bit memory address area
Time of day	
Clock	
• Hardware clock (real-time)	Yes
Digital inputs	
Number of digital inputs	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)
Digital outputs	
Number of digital outputs	10
• of which high-speed outputs	4; 100 kHz Pulse Train Output
Analog inputs	
Number of analog inputs	2
Input ranges	
• Voltage	Yes
Analog outputs	
Number of analog outputs	2
Output ranges, current	
• 0 to 20 mA	Yes

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Technical specifications (continued)

Article number	6ES7217-1AG40-0XB0 CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
1. Interface	
Interface type	PROFINET
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No
- IRT	No
- PROFIenergy	No
- Prioritized startup	Yes
- Number of connectable IO Devices, max.	16
- Number of connectable IO Devices for RT, max.	16
- of which in line, max.	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
PROFINET IO Device	
- Services	
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
- Asset management record	Yes
Protocols	
Redundancy mode	
- Media redundancy	
- MRP	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	No
- MRPD	No
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required
Communication functions	
S7 communication	
• supported	Yes
Number of connections	
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max

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Technical specifications (continued)

Article number	6ES7217-1AG40-0XB0 CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
• Number of users	42
Dimensions	
Width	150 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	530 g

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Overview



- The superior compact solution
- With 14 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB); **not possible with: 6AG1212-1AE40-2XB0, 6AG1212-1BE40-2XB0, 6AG1212-1HE40-2XB0**
  - 2 signal modules (SM)
  - Max. 3 communications modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1212C compact CPU, AC/DC/relay	
(Extended temperature range and exposure to environmental substances)	
Integrated program/data memory 75 KB, load memory 1 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communications modules, 2 signal modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1212-1BE40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1212-1BE40-2XB0**
SIPLUS CPU 1212C compact CPU, DC/DC/DC	
(Extended temperature range and exposure to environmental substances)	
Integrated program/data memory 75 KB, load memory 1 MB; Supply voltage 24 V DC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; Expandable by up to 3 communications modules, 2 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1212-1AE40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1212-1AE40-2XB0**
SIPLUS CPU 1212C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to environmental substances)	
Integrated program/data memory 75 KB, load memory 1 MB; Supply voltage 24 V DC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communications modules, 2 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1212-1HE40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1212-1HE40-2XB0**
Accessories	
SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1212-1....-**2**XB0)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**

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Selection and ordering data (continued)

SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1212-1....-**2**XB0)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**
SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1212-1....-**2**XB0)	
2 inputs, 24 V DC, IEC type 1 sinking input; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1212-1....-**2**XB0)	
Range of ambient temperature -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Range of ambient temperature 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**
SIPLUS CB 1241 RS 485 communication board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1212-1....-**2**XB0)	
For point-to-point connection, with 1 RS485 interface	**6AG1241-1CH30-5XB1**
Other accessories	See SIMATIC S7-1200 CPU 1212C

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Technical specifications

Article number	6AG1212-1AE40-4XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC	6AG1212-1AE40-2XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC
General information		
Product type designation	CPU 1212C DC/DC/DC	CPU 1212C DC/DC/DC
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Storage		
Work memory		
• integrated	100 kbyte	100 kbyte
Load memory		
• Integrated	2 Mbyte	2 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card
CPU processing times		
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity		
Flag		
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Time of day		
Clock		
• Hardware clock (real-time)	Yes	Yes
Digital inputs		
Number of digital inputs	8; Integrated	8; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs		
Number of digital outputs	6	6
• of which high-speed outputs	4; 100 kHz Pulse Train Output	4; 100 kHz Pulse Train Output
Analog inputs		
Number of analog inputs	2	2
Input ranges		
• Voltage	Yes	Yes
Analog outputs		
Number of analog outputs	0	0
1. Interface		
Interface type	PROFINET	PROFINET
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	No	No
- PROFIenergy	No	No
- Prioritized startup	Yes	Yes

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Technical specifications (continued)

Article number	6AG1212-1AE40-4XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC	6AG1212-1AE40-2XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC
- Number of connectable IO Devices, max.	16	16
- Number of connectable IO Devices for RT, max.	16	16
- of which in line, max.	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
PROFINET IO Device		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
- Asset management record	Yes	Yes
Protocols		
Redundancy mode		
- Media redundancy		
- MRP	No	No
- MRP interconnection, supported	No	No
- MRPD	No	No
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
Communication functions		
S7 communication		
• supported	Yes	Yes
Number of connections		
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max

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Technical specifications (continued)

Article number	6AG1212-1AE40-4XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC	6AG1212-1AE40-2XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1212-1AE40-4XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC	6AG1212-1AE40-2XB0 SIPLUS S7-1200 CPU 1212C DC/DC/DC
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
• Number of users	42	42
Dimensions		
Width	90 mm	90 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	370 g	370 g

Article number	6AG1212-1BE40-4XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY	6AG1212-1BE40-2XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY
General information		
Product type designation	CPU 1212C AC/DC/relay	CPU 1212C AC/DC/relay
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Supply voltage		
Rated value (AC)		
• 120 V AC	Yes	Yes
• 230 V AC	Yes	Yes
Storage		
Work memory		
• integrated	100 kbyte	100 kbyte
Load memory		
• Integrated	1 Mbyte	2 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card
CPU processing times		
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity		
Flag		
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Time of day		
Clock		
• Hardware clock (real-time)	Yes	Yes
Digital inputs		
Number of digital inputs	8; Integrated	8; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs		
Number of digital outputs	6; Relays	6; Relays
Analog inputs		
Number of analog inputs	2	2
Input ranges		
• Voltage	Yes	Yes

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Technical specifications (continued)

Article number	6AG1212-1BE40-4XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY	6AG1212-1BE40-2XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY
Analog outputs		
Number of analog outputs	0	0
1. Interface		
Interface type	PROFINET	PROFINET
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	No	No
- PROFIenergy	No	No
- Prioritized startup	Yes	Yes
- Number of connectable IO Devices, max.	16	16
- Number of connectable IO Devices for RT, max.	16	16
- of which in line, max.	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
PROFINET IO Device		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
- Asset management record	Yes	Yes
Protocols		
Redundancy mode		
- Media redundancy		
- MRP	No	No
- MRP interconnection, supported	No	No
- MRPD	No	No
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6AG1212-1BE40-4XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY	6AG1212-1BE40-2XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY
Communication functions		
S7 communication		
• supported	Yes	Yes
Number of connections		
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1212-1BE40-4XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY	6AG1212-1BE40-2XB0 SIPLUS S7-1200 CPU 1212C AC/DC/RLY
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
• Number of users	42	42
Dimensions		
Width	90 mm	90 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	425 g	425 g

Article number	6AG1212-1HE40-4XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY	6AG1212-1HE40-2XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY
General information		
Product type designation	CPU 1212C DC/DC/relay	CPU 1212C DC/DC/relay
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Storage		
Work memory		
• integrated	100 kbyte	100 kbyte
Load memory		
• Integrated	2 Mbyte	2 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card
CPU processing times		
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity		
Flag		
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Time of day		
Clock		
• Hardware clock (real-time)	Yes	Yes
Digital inputs		
Number of digital inputs	8; Integrated	8; Integrated
• of which inputs usable for technological functions	4; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs		
Number of digital outputs	6; Relays	6; Relays
Analog inputs		
Number of analog inputs	2	2
Input ranges		
• Voltage	Yes	Yes

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Technical specifications (continued)

Article number	6AG1212-1HE40-4XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY	6AG1212-1HE40-2XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY
Analog outputs		
Number of analog outputs	0	0
1. Interface		
Interface type	PROFINET	PROFINET
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	No	No
- PROFIenergy	No	No
- Prioritized startup	Yes	Yes
- Number of connectable IO Devices, max.	16	16
- Number of connectable IO Devices for RT, max.	16	16
- of which in line, max.	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
PROFINET IO Device		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
- Asset management record	Yes	Yes
Protocols		
Redundancy mode		
- Media redundancy		
- MRP	No	No
- MRP interconnection, supported	No	No
- MRPD	No	No
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6AG1212-1HE40-4XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY	6AG1212-1HE40-2XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY
Communication functions		
S7 communication		
• supported	Yes	Yes
Number of connections		
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

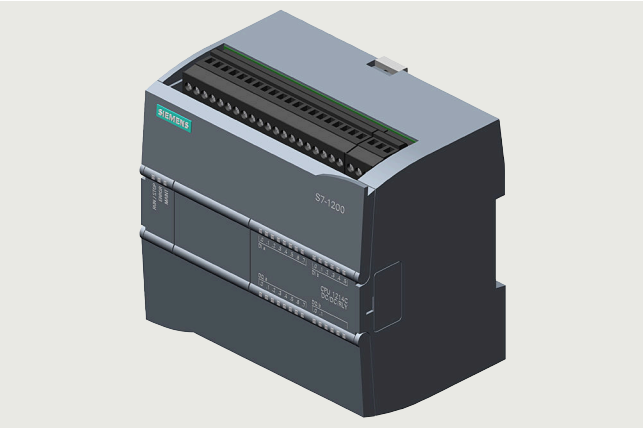
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Technical specifications (continued)

Article number	6AG1212-1HE40-4XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY	6AG1212-1HE40-2XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
• Number of users	42	42
Dimensions		
Width	90 mm	90 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	385 g	385 g

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Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable by:
  - 1 signal board (SB) or communication board (CB); **not possible with: 6AG1214-1AG40-2XB0, 6AG1214-1BG40-2XB0, 6AG1214-1HG40-2XB0**
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1214C compact CPU, AC/DC/relay (Extended temperature range and exposure to environmental substances) Integrated program/data memory 100 KB, load memory 2 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communications modules, 8 signal modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1214-1BG40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C	**6AG1214-1BG40-5XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1214-1BG40-2XB0**
SIPLUS CPU 1214C compact CPU, DC/DC/DC (Extended temperature range and exposure to environmental substances) Integrated program/data memory 100 KB, load memory 2 MB; Supply voltage 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1214-1AG40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C	**6AG1214-1AG40-5XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1214-1AG40-2XB0**

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Selection and ordering data (continued)

SIPLUS CPU 1214C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to environmental substances)	
Integrated program/data memory 100 KB, load memory 2 MB; Supply voltage 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1214-1HG40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C	**6AG1214-1HG40-5XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1214-1HG40-2XB0**
Accessories	
SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1214-1....-**2**XB0)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**
SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1214-1....-**2**XB0)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**
SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1214-1....-**2**XB0)	
2 inputs, 24 V DC, IEC type 1 sinking input; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1214-1....-**2**XB0)	
Range of ambient temperature -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Range of ambient temperature 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**

Selection and ordering data (continued)

SIPLUS CB 1241 RS 485 communication board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1214-1....-**2**XB0)	
For point-to-point connection, with 1 RS485 interface	**6AG1241-1CH30-5XB1**
Other accessories	See SIMATIC S7-1200 CPU 1214C

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Technical specifications

Article number	6AG1214-1AG40-4XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1AG40-5XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1AG40-2XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC
General information			
Product type designation	CPU 1214C DC/DC/DC	CPU 1214C DC/DC/DC	CPU 1214C DC/DC/DC
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Storage			
Work memory			
• integrated	150 kbyte	150 kbyte	150 kbyte
Load memory			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10	10	10
• of which high-speed outputs	4; 100 kHz Pulse Train Output	4; 100 kHz Pulse Train Output	4; 100 kHz Pulse Train Output
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0

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Technical specifications (continued)

Article number	6AG1214-1AG40-4XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1AG40-5XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1AG40-2XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	1	1	1
• integrated switch	No	No	No
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6AG1214-1AG40-4XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1AG40-5XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1AG40-2XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)

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Technical specifications (continued)

Article number	6AG1214-1AG40-4XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1AG40-5XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1AG40-2XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	415 g	415 g	415 g

Article number	6AG1214-1BG40-4XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-5XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-2XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
General information			
Product type designation	CPU 1214C AC/DC/relay	CPU 1214C AC/DC/relay	CPU 1214C AC/DC/relay
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Supply voltage			
Rated value (AC)			
• 120 V AC	Yes	Yes	Yes
• 230 V AC	Yes	Yes	Yes
Storage			
Work memory			
• integrated	100 kbyte	100 kbyte	100 kbyte
Load memory			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card

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Technical specifications (continued)

Article number	6AG1214-1BG40-4XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-5XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-2XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; Relays	10; Relays	10; Relays
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	1	1	1
• integrated switch	No	No	No
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1214-1BG40-4XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-5XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-2XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max

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Technical specifications (continued)

Article number	6AG1214-1BG40-4XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-5XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-2XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1214-1BG40-4XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-5XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6AG1214-1BG40-2XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	455 g	455 g	455 g

Article number	6AG1214-1HG40-4XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1HG40-5XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1HG40-2XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY
General information			
Product type designation	CPU 1214C DC/DC/relay	CPU 1214C DC/DC/relay	CPU 1214C DC/DC/relay
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Storage			
Work memory			
• integrated	100 kbyte	100 kbyte	100 kbyte
Load memory			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; Relays	10; Relays	10; Relays

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Technical specifications (continued)

Article number	6AG1214-1HG40-4XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1HG40-5XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1HG40-2XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	1	1	1
• integrated switch	No	No	No
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6AG1214-1HG40-4XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1HG40-5XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1HG40-2XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	16; dynamically	16; dynamically	16; dynamically
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)

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Technical specifications (continued)

Article number	6AG1214-1HG40-4XB0	6AG1214-1HG40-5XB0	6AG1214-1HG40-2XB0
	SIPLUS S7-1200 CPU 1214C DC/DC/RLY	SIPLUS S7-1200 CPU 1214C DC/DC/RLY	SIPLUS S7-1200 CPU 1214C DC/DC/RLY
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	435 g	435 g	435 g

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Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable by:
  - 1 signal board (SB) or communication board (CB); **not possible with: 6AG1215-1AG40-2XB0, 6AG1215-1BG40-2XB0, 6AG1215-1HG40-2XB0**
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1215C compact CPU, AC/DC/relay	
(Extended temperature range and exposure to environmental substances)	
Integrated program and data memory 125 KB, load memory 4 MB; wide-range power supply 85 ... 264 V AC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs, 2 analog outputs; expandable by up to 3 communications modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1215-1BG40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C	**6AG1215-1BG40-5XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1215-1BG40-2XB0**
SIPLUS CPU 1215C compact CPU, DC/DC/DC	
(Extended temperature range and exposure to environmental substances)	
Integrated program and data memory 125 KB, load memory 4 MB; Supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs, 2 analog outputs; expandable by up to 3 communications modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz; 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1215-1AG40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C	**6AG1215-1AG40-5XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1215-1AG40-2XB0**

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Selection and ordering data (continued)

SIPLUS CPU 1215C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to environmental substances)	
Integrated program and data memory 125 KB, load memory 4 MB; Supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs, 2 analog outputs; expandable by up to 3 communications modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1215-1HG40-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C	**6AG1215-1HG40-5XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1215-1HG40-2XB0**
Accessories	
SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1215-1....-**2**XB0)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**
SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1215-1....-**2**XB0)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**
SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1215-1....-**2**XB0)	
2 inputs, 24 V DC, IEC type 1 sinking input; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1215-1....-**2**XB0)	
Range of ambient temperature -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Range of ambient temperature 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**
SIPLUS CB 1241 RS 485 communication board	
(Extended temperature range and exposure to environmental substances; cannot be used with 6AG1215-1....-**2**XB0)	
For point-to-point connection, with 1 RS485 interface	**6AG1241-1CH30-5XB1**

Selection and ordering data (continued)

Other accessories	See SIMATIC S7-1200 CPU 1215C

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Technical specifications

Article number	6AG1215-1HG40-4XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY	6AG1215-1HG40-5XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY	6AG1215-1HG40-2XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY
General information			
Product type designation	CPU 1215C DC/DC/relay	CPU 1215C DC/DC/relay	CPU 1215C DC/DC/relay
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Storage			
Work memory			
• integrated	200 kbyte	200 kbyte	200 kbyte
Load memory			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; Relays	10; Relays	10; Relays
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	2	2	2
Output ranges, current			
• 0 to 20 mA	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1215-1HG40-4XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY	6AG1215-1HG40-5XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY	6AG1215-1HG40-2XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6AG1215-1HG40-4XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY	6AG1215-1HG40-5XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY	6AG1215-1HG40-2XB0 SIPLUS S7-1200 CPU 1215C DC/DC/RLY
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)

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Technical specifications (continued)

Article number	6AG1215-1HG40-4XB0	6AG1215-1HG40-5XB0	6AG1215-1HG40-2XB0
	SIPLUS S7-1200 CPU 1215C DC/DC/RLY	SIPLUS S7-1200 CPU 1215C DC/DC/RLY	SIPLUS S7-1200 CPU 1215C DC/DC/RLY
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	130 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	585 g	585 g	585 g

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Overview



- Powerful controller for extremely fast signal processing
  Expandable with:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communications modules (CM)

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1217 compact CPU, DC/DC/DC (Extended temperature range and exposure to environmental substances) 2 PROFINET ports onboard I/O: 10 DI 24 V DC; 4 DI RS-422/485; 6 DO 24 V DC; 0.5 A; 4 DO RS-422/485; 6 DO 24 V DC; 0.5 A; 4 DO RS-422/485 2 AI 0-10 V DC, 2 AO 0 - 20 mA power supply: 20.4 - 28.8 V DC, program/data memory 150 KB, 20.4 - 28.8 V DC, program/data memory 150 KB	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +70 °C	**6AG1217-1AG40-2XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C	**6AG1217-1AG40-5XB0**

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Technical specifications

Article number	6AG1217-1AG40-2XB0 SIPLUS S7-1200 CPU 1217C DC/DC/DC	6AG1217-1AG40-5XB0 SIPLUS S7-1200 CPU 1217C DC/DC/DC
General information		
Product type designation	CPU 1217C DC/DC/DC	CPU 1217C DC/DC/DC
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Storage		
Work memory		
• integrated	150 kbyte	150 kbyte
Load memory		
• Integrated	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card
CPU processing times		
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / Operation	2.3 µs; / Operation
Data areas and their retentivity		
Flag		
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day		
Clock		
• Hardware clock (real-time)	Yes	Yes
Digital inputs		
Number of digital inputs	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs		
Number of digital outputs	10	10
• of which high-speed outputs	4; 100 kHz Pulse Train Output	4; 100 kHz Pulse Train Output
Analog inputs		
Number of analog inputs	2	2
Input ranges		
• Voltage	Yes	Yes
Analog outputs		
Number of analog outputs	2	2
Output ranges, current		
• 0 to 20 mA	Yes	Yes

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Technical specifications (continued)

Article number	6AG1217-1AG40-2XB0 SIPLUS S7-1200 CPU 1217C DC/DC/DC	6AG1217-1AG40-5XB0 SIPLUS S7-1200 CPU 1217C DC/DC/DC
1. Interface		
Interface type	PROFINET	PROFINET
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	No	No
- PROFIenergy	No	No
- Prioritized startup	Yes	Yes
- Number of connectable IO Devices, max.	16	16
- Number of connectable IO Devices for RT, max.	16	16
- of which in line, max.	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
PROFINET IO Device		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
- Asset management record	Yes	Yes
Protocols		
Redundancy mode		
- Media redundancy		
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	No	No
- MRPD	No	No
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6AG1217-1AG40-2XB0 SIPLUS S7-1200 CPU 1217C DC/DC/DC	6AG1217-1AG40-5XB0 SIPLUS S7-1200 CPU 1217C DC/DC/DC
Communication functions		
S7 communication		
• supported	Yes	Yes
Number of connections		
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 64 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 64 max
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax; Tmax > 55 °C number of simultaneously switched-on digital inputs 5, current sinking/current sourcing (no adjacent points) and 4 differential inputs with horizontal mounting position; Tmax > 55 °C number of simultaneously switched-on digital inputs 3, current sinking (no adjacent points) and 4 differential outputs with horizontal mounting position	60 °C; = Tmax; Tmax > 55 °C number of simultaneously switched-on digital inputs 5, current sinking/current sourcing (no adjacent points) and 4 differential inputs with horizontal mounting position; Tmax > 55 °C number of simultaneously switched-on digital inputs 3, current sinking (no adjacent points) and 4 differential outputs with horizontal mounting position
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)

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Technical specifications (continued)

Article number	6AG1217-1AG40-2XB0 SIPLUS S7-1200 CPU 1217C DC/DC/DC	6AG1217-1AG40-5XB0 SIPLUS S7-1200 CPU 1217C DC/DC/DC
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
• Number of users	42	42
Dimensions		
Width	150 mm	150 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	530 g	530 g

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Overview



The fail-safe SIMATIC S7-1200 Controllers are based on the S7-1200 standard CPUs and offer additional safety-related functions.

They can be used for safety-related tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured blocks for safety-related functions certified by the German Technical Inspectorate (TÜV).

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of the standard I/O modules together with the fail-safe I/O modules in the central system
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via fieldbus such as PROFINET or PROFIBUS
  - F-library certified by the German Technical Inspectorate (TÜV) for all common safety functions
  - Free programming of the safety logic using FBD and LAD
  - Standard-compliant printout of the F-program
- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio
- Integrated system diagnostics of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostics information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	CPU 1212 FC	CPU 1214 FC	CPU 1215 FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay
Work memory, integrated	150 KB	200 KB	250 KB
Load memory, integrated	2 MB	4 MB	4 MB
Memory card	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)
Standard digital inputs/outputs, integrated	8/6	14/10	14/10
Standard analog inputs, integrated	2	2	2
Standard analog outputs, integrated	-	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1	Max. 1
Expansion by signal modules	Max. 2	Max. 8	Max. 8
Expansion by communications modules	Max. 3	Max. 3	Max. 3

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Selection and ordering data

CPU 1212 FC	
SIMATIC S7-1200F, CPU 1212 FC, compact CPU, DC/DC/DC Onboard I/O: 8 DI 24 V DC; 6 DO 24 V DC; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 150 KB	**6ES7212-1AF40-0XB0**
SIMATIC S7-1200, CPU 1212FC, compact CPU, DC/DC/relay Onboard I/O: 8 DI 24 V DC; 6 DO relay 2 A; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 150 KB	**6ES7212-1HF40-0XB0**
CPU 1214 FC	
SIMATIC S7-1200F, CPU 1214 FC, compact CPU, DC/DC/DC Onboard I/O: 14 DI 24 V DC; 10 DO 24 V DC; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 200 KB	**6ES7214-1AF40-0XB0**
SIMATIC S7-1200F, CPU 1214 FC, compact CPU, DC/DC/relay Onboard I/O: 14 DI 24 V DC; 10 DO relay 2 A; 2 AI 0-10 V DC, power supply: 20.4-28.8 V DC, program/data memory 200 KB	**6ES7214-1HF40-0XB0**
CPU 1215 FC	
SIMATIC S7-1200F, CPU 1215 FC, compact CPU, DC/DC/DC 2 PROFINET ports, onboard I/O: 14 DI 24 V DC; 10 DO 24 V DC; 0.5 A; 2 AI 0-10 V DC, 2 AO 0-20 mA DC, power supply: 20.4-28.8 V DC, program/data memory 250 KB	**6ES7215-1AF40-0XB0**
SIMATIC S7-1200F, CPU 1215 FC, compact CPU, DC/DC/relay 2 PROFINET ports, onboard I/O: 14 DI 24 V DC; 10 DO relay 2 A, 2 AI 0-10 V DC, 2 AO 0-20 mA DC, power supply: 20.4-28.8 V DC, program/data memory 250 KB	**6ES7215-1HF40-0XB0**
Accessories	
SIMATIC S7-1200, SIM 1274 simulator module For CPU 1214/1215 14 input switches 24 V DC	**6ES7274-1XH30-0XA0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part)	
For CPU 1214 FC, DC/DC/DC	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on input side (4 units with 20 screws each)	**6ES7292-1AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on output side (4 units with 12 screws each)	**6ES7292-1AM30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block Analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
For CPU 1214 FC, DC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on input side (4 units with 20 screws each)	**6ES7292-1AV30-0XA0**

Selection and ordering data (continued)

SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1214C/1215C on output side, (4 units with 12 screws each)	**6ES7292-1AM40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block Analog inputs CPU 1211C/1212C/1214C (4 units with 3 screws each)	**6ES7292-1BC30-0XA0**
For CPU 1215 FC, DC/DC/DC	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on input side (4 units with 20 screws each)	**6ES7292-1AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on output side (4 units with 12 screws each)	**6ES7292-1AM30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block Analog signals CPU 1215C/1217C, (4 units with 6 screws each)	**6ES7292-1BF30-0XB0**
For CPU 1215 FC, DC/DC/relay	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block CPU 1214C/1215C on input side (4 units with 20 screws each)	**6ES7292-1AV30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, CPU 1214C/1215C on output side, (4 units with 12 screws each)	**6ES7292-1AM40-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block Analog signals CPU 1215C/1217C, (4 units with 6 screws each))	**6ES7292-1BF30-0XB0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps CPU 1214 (CPU 1214 front flap top/front flap bottom/signal board cover) 4 units each	**6ES7291-1AB30-0XA0**
SIMATIC S7-1200, spare part front flaps CPU 1215C (CPU 1215C front flap top/front flap bottom/signal board cover) 4 units each	**6ES7291-1AC30-0XA0**
RJ45 strain relief	
SIMATIC S7-1200, RJ45 strain relief Single port 4 units per packing unit	**6ES7290-3AA30-0XA0**
SIMATIC S7-1200, RJ45 strain relief Dual port 4 units per packing unit	**6ES7290-3AB30-0XA0**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**

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Selection and ordering data (continued)

SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
STEP 7 Safety Basic V19 **Task:** Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC **Requirement:** STEP 7 Basic V19 or higher Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Basic V19, engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V19 as of STEP 7 Basic V19; for configuring SIMATIC S7-1200F Content: 1x USB	**6ES7833-1FB23-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Basic V19, engineering software; floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V19 as of STEP 7 Basic V19; for configuring SIMATIC S7-1200F Consignee email address required for delivery	**6ES7833-1FB23-0YH5**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7212-1AF40-0-XB0 CPU 1212FC ,DC/DC/DC, 8DI/6DO/2AI	6ES7212-1HF40-0-XB0 CPU 1212FC, DC/DC/Relay, 8DI/6DO/2AI	6ES7214-1AF40-0-XB0 CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	6ES7214-1HF40-0-XB0 CPU 1214 FC, DC/DC/Relay, 14DI/10DO/2AI	6ES7215-1AF40-0-XB0 CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/-2AO	6ES7215-1HF40-0-XB0 CPU 1215 FC, DC/DC/RLY,14DI/-10DO/2AI/2AO
General information						
Product type designation	CPU 1212FC DC/DC/DC	CPU 1212FC DC/DC/relay	CPU 1214FC DC/DC/DC	CPU 1214FC DC/DC/Relay	CPU 1215FC DC/DC/DC	CPU 1215FC DC/DC/relay
Engineering with						
• Programming package	STEP 7 V20 or higher	STEP 7 V20 or higher	STEP 7 V20 or higher	STEP 7 V20 or higher	STEP 7 V20 or higher	STEP 7 V20 or higher
Supply voltage						
Rated value (DC)						
• 24 V DC	Yes	Yes	Yes	Yes	Yes	Yes
Storage						
Work memory						
• Integrated	150 kbyte	150 kbyte	200 kbyte	200 kbyte	250 kbyte	250 kbyte
Load memory						
• Integrated	2 Mbyte	2 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times						
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity						
Flag						
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day						
Clock						
• Hardware clock (real-time)	Yes	Yes	Yes	Yes	Yes	Yes
Digital inputs						
Number of digital inputs	8; Integrated	8; Integrated	14; Integrated	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs						
Number of digital outputs	6	6; Relays	10	10; Relays	10	10; Relays
• of which high-speed outputs	4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output	
Analog inputs						
Number of analog inputs	2	2	2	2	2	2
Input ranges						
• Voltage	Yes	Yes	Yes	Yes	Yes	Yes
Analog outputs						
Number of analog outputs	0	0	0	0	2	2
Output ranges, current						
• 0 to 20 mA					Yes	Yes

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Technical specifications (continued)

Article number	6ES7212-1AF40-0-XB0	6ES7212-1HF40-0-XB0	6ES7214-1AF40-0-XB0	6ES7214-1HF40-0-XB0	6ES7215-1AF40-0-XB0	6ES7215-1HF40-0-XB0
	CPU 1212FC ,DC/DC/DC, 8DI/6DO/2AI	CPU 1212FC, DC/DC/Relay, 8DI/6DO/2AI	CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	CPU 1214 FC, DC/DC/Relay, 14DI/10DO/2AI	CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/-2AO	CPU 1215 FC, DC/DC/RLY,14DI/-10DO/2AI/2AO
1. Interface						
Interface type	PROFINET	PROFINET	PROFINET	PROFINET	PROFINET	PROFINET
Interface types						
• RJ 45 (Ethernet)	Yes		Yes	Yes	Yes	Yes
• Number of ports	1	1	1	1	2	2
• integrated switch	No	No	No	No	Yes	Yes
Protocols						
• PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes	Yes	Yes	Yes
• Media redundancy	No	No	No	No	Yes; as MRP client	Yes
PROFINET IO Controller						
- Services						
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No	No	No	No
- IRT	No	No	No	No	No	No
- PROFIenergy	No	No	No	No	No	No
- Prioritized startup	Yes	Yes	Yes	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16	16	16	16
- of which in line, max.	16	16	16	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8	8	8	8
PROFINET IO Device						
- Services						
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No	No	No	No
- IRT	No	No	No	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No	No	No	No
- PROFIenergy	Yes	Yes	Yes	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2	2	2	2
- Asset management record	Yes	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7212-1AF40-0-XB0 CPU 1212FC ,DC/DC/DC, 8DI/6DO/2AI	6ES7212-1HF40-0-XB0 CPU 1212FC, DC/DC/Relay, 8DI/6DO/2AI	6ES7214-1AF40-0-XB0 CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	6ES7214-1HF40-0-XB0 CPU 1214 FC, DC/DC/Relay, 14DI/10DO/2AI	6ES7215-1AF40-0-XB0 CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/-2AO	6ES7215-1HF40-0-XB0 CPU 1215 FC, DC/DC/RLY,14DI/-10DO/2AI/2AO
Protocols						
Redundancy mode						
- Media redundancy						
- MRP	No	No	No	No	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	No	No	No	No	No	No
- MRPD	No	No	No	No	No	No
SIMATIC communication						
• S7 routing	Yes	Yes	Yes	Yes	Yes	Yes
OPC UA						
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
Communication functions						
S7 communication						
• supported	Yes	Yes	Yes	Yes	Yes	Yes
Number of connections						
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions						
Ambient temperature during operation						
• min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• max.	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	55 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical

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Technical specifications (continued)

Article number	6ES7212-1AF40-0-XB0 CPU 1212FC ,DC/DC/DC, 8DI/6DO/2AI	6ES7212-1HF40-0-XB0 CPU 1212FC, DC/DC/Relay, 8DI/6DO/2AI	6ES7214-1AF40-0-XB0 CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	6ES7214-1HF40-0-XB0 CPU 1214 FC, DC/DC/Relay, 14DI/10DO/2AI	6ES7215-1AF40-0-XB0 CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/-2AO	6ES7215-1HF40-0-XB0 CPU 1215 FC, DC/DC/RLY,14DI/-10DO/2AI/2AO
Configuration						
Know-how protection						
• User program protection/password protection	Yes	Yes	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes	Yes	Yes
Access protection						
• protection of confidential configuration data	Yes	Yes	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42	42	42	42
Dimensions						
Width	90 mm	90 mm	110 mm	110 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm	75 mm
Weights						
Weight, approx.	370 g	385 g	415 g	435 g	500 g	585 g

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Overview



The fail-safe SIPLUS S7-1200 Controllers are based on the SIPLUS S7-1200 standard CPUs and offer additional safety-related functions.

They can be used for safety-related tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal engineering framework. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured blocks for safety-related functions certified by the German Technical Inspectorate (TÜV).

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of the standard I/O modules together with the fail-safe I/O modules in the central system
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via fieldbus such as PROFINET or PROFIBUS
  - F-library certified by the German Technical Inspectorate (TÜV) for all common safety functions
  - Free programming of the safety logic using FBD and LAD
  - Standard-compliant printout of the F-program
- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio

Overview (continued)

- Integrated system diagnostics of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostics information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	SIPLUS CPU 1214 FC	SIPLUS CPU 1215 FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC
Work memory, integrated	125 KB	150 KB
Load memory, integrated	4 MB	4 MB
Memory card	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)
Standard digital inputs/outputs, integrated	14/10	14/10
Standard analog inputs, integrated	2	2
Standard analog outputs, integrated	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1
Expansion by signal modules	Max. 8	Max. 8
Expansion by communications modules	Max. 3	Max. 3

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

CPU 1214 FC (Extended temperature range and exposure to environmental substances)	
Fail-safe compact CPU, DC/DC/DC; Integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6AG1214-1AF40-5XB0**
Fail-safe compact CPU, DC/DC/relay Integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC Boolean execution times 0.085 µs per operation 14 digital inputs, 10 digital outputs (relays) 2 analog inputs Expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board Digital inputs can be used as HSC at 100 kHz	**6AG1214-1HF40-5XB0**
CPU 1215 FC (Extended temperature range and exposure to environmental substances)	
Fail-safe compact CPU, DC/DC/DC Integrated program/data memory 150 KB, load memory 4 MB Supply voltage 24 V DC Boolean execution times 0.085 µs per operation 14 digital inputs, 10 digital outputs 2 analog inputs; 2 analog outputs Expandable by up to 3 communications modules, 8 signal modules, and 1 signal board/communication board Digital inputs can be used as HSC at 100 kHz 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6AG1215-1AF40-5XB0**
Accessories	See SIMATIC CPU 121x FC

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Technical specifications

Article number	6AG1214-1AF40-5XB0 SIPLUS S7-1200 CPU 1214FC DC/DC/DC	6AG1214-1HF40-5XB0 SIPLUS S7-1200 CPU 1214FC DC/DC/RLY	6AG1215-1AF40-5XB0 SIPLUS S7-1200 CPU 1215FC DC/DC/DC
General information			
Product type designation	CPU 1214FC DC/DC/DC	CPU 1214FC DC/DC/Relay	CPU 1215FC DC/DC/DC
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Storage			
Work memory			
• integrated	200 kbyte	200 kbyte	250 kbyte
Load memory			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10	10; Relays	10
• of which high-speed outputs	4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	2
Output ranges, current			
• 0 to 20 mA			Yes

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Technical specifications (continued)

Article number	6AG1214-1AF40-5XB0 SIPLUS S7-1200 CPU 1214FC DC/DC/DC	6AG1214-1HF40-5XB0 SIPLUS S7-1200 CPU 1214FC DC/DC/RLY	6AG1215-1AF40-5XB0 SIPLUS S7-1200 CPU 1215FC DC/DC/DC
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	1	1	2
• integrated switch	No	No	Yes
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	Yes; as MRP client
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- PROFIenergy	No	No	No
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	16	16	16
- Number of connectable IO Devices for RT, max.	16	16	16
- of which in line, max.	16	16	16
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	No	No	No
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes
Protocols			
Redundancy mode			
- Media redundancy			
- MRP	No	No	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	No	No	No
- MRPD	No	No	No
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6AG1214-1AF40-5XB0 SIPLUS S7-1200 CPU 1214FC DC/DC/DC	6AG1214-1HF40-5XB0 SIPLUS S7-1200 CPU 1214FC DC/DC/RLY	6AG1215-1AF40-5XB0 SIPLUS S7-1200 CPU 1215FC DC/DC/DC
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 68 max
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	55 °C; = Tmax (number of simultaneously activated inputs or outputs: 4 or 3 (no adjacent points) at 60 °C horizontally or 50 °C vertically, 8 or 6 at 55 °C horizontally or 45 °C vertically)	55 °C; = Tmax (number of simultaneously activated inputs or outputs: 4 or 3 (no adjacent points) at 60 °C horizontally or 50 °C vertically, 8 or 6 at 55 °C horizontally or 45 °C vertically)	55 °C; = Tmax (number of simultaneously activated inputs or outputs: 4 or 3 (no adjacent points) at 60 °C horizontally or 50 °C vertically, 8 or 6 at 55 °C horizontally or 45 °C vertically)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes	Yes	Yes
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)

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Technical specifications (continued)

Article number	6AG1214-1AF40-5XB0 SIPLUS S7-1200 CPU 1214FC DC/DC/DC	6AG1214-1HF40-5XB0 SIPLUS S7-1200 CPU 1214FC DC/DC/RLY	6AG1215-1AF40-5XB0 SIPLUS S7-1200 CPU 1215FC DC/DC/DC
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	42	42	42
Dimensions			
Width	110 mm	110 mm	130 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	415 g	435 g	500 g

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Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs

Selection and ordering data

SM 1221 digital input signal module	
SIMATIC S7-1200, SM 1221 digital input module 8 DI, 24 V DC, sink/source	**6ES7221-1BF32-0XB0**
SIMATIC S7-1200, SM 1221 digital input module 16 DI, 24 V DC, sink/source	**6ES7221-1BH32-0XB0**
Accessories	
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part) For 6ES7221-1BF32-0XB0, 6ES7221-1BH32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 8CH/16CH (4 units with 7 screws each)	**6ES7292-1AG30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for digital signal modules 8CH/16CH (4 units with 7 pins each)	**6ES7292-2AG30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**

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Technical specifications

Article number	6ES7221-1BF32-0XB0 Digital Input SM 1221, 8DI, 24V DC	6ES7221-1BH32-0XB0 Digital Input SM 1221, 16DI, 24V DC
General information		
Product type designation	SM 1221, DI 8x24 V DC	SM 1221, DI 16x24 V DC
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
from backplane bus 5 V DC, max.	105 mA	130 mA
Digital inputs		
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel
Output voltage		
Power supply to the transmitters		
• present	Yes	Yes
Digital inputs		
Number of digital inputs	8	16
• in groups of	2	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA
Input current		
• for signal "1", typ.	4 mA	4 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs		
- Parameterizable	Yes	Yes
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm

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Technical specifications (continued)

Article number	6ES7221-1BF32-0XB0 Digital Input SM 1221, 8DI, 24V DC	6ES7221-1BH32-0XB0 Digital Input SM 1221, 16DI, 24V DC
Weights		
Weight, approx.	170 g	210 g

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Overview



- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Selection and ordering data

SB 1221 digital input signal board	
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 5 V DC 200 kHz, sourcing input	**6ES7221-3AD30-0XB0**
SIMATIC S7-1200, SB 1221 digital input module 4 DI, 24 V DC 200 kHz, sourcing input	**6ES7221-3BD30-0XB0**
Terminal block (spare part) for signal board	
SIMATIC S7-1200, spare part gold-plated I/O terminal block Signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7221-3AD30-0XB0 Signal Board SB 1221, 4 DI 5VDC 200KHz	6ES7221-3BD30-0XB0 Signal Board SB 1221, 4 DI 24VDC 200KHz
General information		
Product type designation	SB 1221, DI 4x5 V DC 200 kHz	SB 1221, DI 4x24 V DC 200 kHz
Input current		
from backplane bus 5 V DC, typ.	40 mA	40 mA
Digital inputs		
Number of digital inputs	4; Current-sourcing	4; Current-sourcing
• in groups of	4	4
Input voltage		
• Rated value (DC)	5 V	24 V
• for signal "0"	(L+ minus 1.0 V DC) ... L+ (2.2 ... 0 mA)	(L+ minus 5.0 V DC) ... L+ (1.4 ... 0 mA)
• for signal "1"	0 V ... (L+ minus 2.0 V DC (20 ... 5.1 mA))	0 V ... (L+ minus 10 V DC (10 ... 2.9 mA))
Input current		
• for signal "0", max. (permissible quiescent current)	2.2 mA	1.4 mA
• for signal "1", min.	5.1 mA	2.9 mA
• for signal "1", typ.	15 mA	7 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
- for interrupt inputs		
- Parameterizable	Yes	Yes
- for technological functions		
- parameterizable	Yes	Yes
Interrupts/diagnostics/status information		
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weights		
Weight, approx.	35 g	35 g

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs

Selection and ordering data

SM 1222 digital output signal module	
SIMATIC S7-1200, SM 1222 digital output module 8 DO, 24 V DC, transistor 0.5 A	**6ES7222-1BF32-0XB0**
SIMATIC S7-1200, SM 1222 digital output module 16 DO, 24 V DC, transistor 0.5 A	**6ES7222-1BH32-0XB0**
SIMATIC S7-1200, SM 1222 digital output module 16 DO, 24 V DC, sinking output, NPN transistor 0.5 A	**6ES7222-1BH32-1XB0**
SIMATIC S7-1200, SM 1222 digital output module 8 DO, relay 2 A	**6ES7222-1HF32-0XB0**
SIMATIC S7-1200, SM 1222 digital output module 8 DO, relay changeover contact	**6ES7222-1XF32-0XB0**
SIMATIC S7-1200, SM 1222 digital output module 16 DO, relay 2 A	**6ES7222-1HH32-0XB0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part)	
For 6ES7222-1BF32-0XB0, 6ES7222-1BH32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 8CH/16CH (4 units with 7 screws each)	**6ES7292-1AG30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for digital signal modules 8CH/16CH (4 units with 7 pins each)	**6ES7292-2AG30-0XA0**
For 6ES7222-1HF32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded left, for digital signal modules 8CH/16CH, (4 units with 7 screws each)	**6ES7292-1AG40-0XA1**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Push-in technology, encoded left, for digital signal modules 8CH/16CH, (4 units with 7 pins each)	**6ES7292-2AG40-0XA1**
For 6ES7222-1HH32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded, for digital signal modules 8CH/16CH, (4 units with 7 screws each)	**6ES7292-1AG40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded, for digital signal modules 8CH/16CH, (4 units with 7 pins each)	**6ES7292-2AG40-0XA0**
For 6ES7222-1XF32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, digital signal module 32CH (4 units with 11 screws each)	**6ES7292-1AL40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for digital signal modules 32CH (4 units with 11 pins each)	**6ES7292-2AL40-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**
SIMATIC S7-1200, spare part front flaps signal module 70 mm (signal module 70 mm wide front flap top & bottom) 6 units each	**6ES7291-1BB30-0XA0**

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Technical specifications

Article number	6ES7222-1BF32-0-XB0	6ES7222-1BH32-0-XB0	6ES7222-1BH32-1-XB0	6ES7222-1HF32-0-XB0	6ES7222-1HH32-0-XB0	6ES7222-1XF32-0-XB0
	Digital Output SM1222, 8 DO, 24V DC	Digital Output SM1222, 16 DO, 24V DC	Digital Output SM1222, 16DO, 24V DC sink	Digital Output SM 1222, 8 DO, Relay	Digital Output SM1222, 16 DO, Relay	Digital Output SM 1222, 8 DO, Changeover
General information						
Product type designation	SM 1222, DQ 8x24 V DC/0.5 A	SM 1222, DQ 16x24 V DC/0.5 A	SM 1222, DO 16x 24 V DC/0.5 A Sink	SM 1222, DQ 8x relay/2 A	SM 1222, DQ 16x relay/2 A	SM 1222, DQ 8x relay/2 A
Input current						
from backplane bus 5 V DC, max.	120 mA	140 mA	140 mA	120 mA	135 mA	140 mA
Digital outputs						
• from load voltage L+, max.				11 mA/relay coil	11 mA/relay coil	16.7 mA/relay coil
Digital outputs						
Number of digital outputs	8	16	16	8	16	8
• in groups of	1	1	1	2	1	1
Current-sinking			Yes			
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -48 V	typ. (L+) -48 V	Typ 45 V			
Switching capacity of the outputs						
• with resistive load, max.	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage						
• Rated value (DC)	24 V	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)				5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load	L+ minus 0.75 V DC with 10k Load			
• for signal "1", min.	20 V DC	20 V DC	0,5 V			
Output current						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA	75 µA			
Output delay with resistive load						
• "0" to "1", max.	50 µs	50 µs	20 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	350 µs	10 ms	10 ms	10 ms
Total current of the outputs (per group)						
- horizontal installation						
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	8 A; Current per mass	10 A; Current per mass	10 A; Current per mass	2 A; Current per mass
Relay outputs						
• Number of relay outputs				8	16	8
• Rated supply voltage of relay coil L+ (DC)				24 V	24 V	24 V
• Number of operating cycles, max.				mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts						
- with inductive load, max.				2 A	2 A	2 A
- on lamp load, max.				30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.				2 A	2 A	2 A

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Technical specifications (continued)

Article number	6ES7222-1BF32-0-XB0	6ES7222-1BH32-0-XB0	6ES7222-1BH32-1-XB0	6ES7222-1HF32-0-XB0	6ES7222-1HH32-0-XB0	6ES7222-1XF32-0-XB0
	Digital Output SM1222, 8 DO, 24V DC	Digital Output SM1222, 16 DO, 24V DC	Digital Output SM1222, 16DO, 24V DC sink	Digital Output SM 1222, 8 DO, Relay	Digital Output SM1222, 16 DO, Relay	Digital Output SM 1222, 8 DO, Changeover
Interrupts/diagnostics/status information						
Alarms						
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED						
• for status of the outputs	Yes	Yes	Yes	Yes	Yes	Yes
Potential separation						
Potential separation digital outputs						
• between the channels and backplane bus	500 V AC	500 V AC	500 V AC	1 500 V AC for 1 minute	1 500 V AC for 1 minute	1 500 V AC for 1 minute
Degree and class of protection						
IP degree of protection	IP20	IP20	IP20	IP20	IP20	IP20
Standards, approvals, certificates						
CE mark	Yes	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes	Yes
KC approval	Yes	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes	Yes	Yes
Ambient conditions						
Ambient temperature during operation						
• min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical
Connection method						
required front connector	Yes	Yes	Yes	Yes	Yes	Yes
Mechanics/material						
Enclosure material (front)						
• plastic	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions						
Width	45 mm	45 mm	45 mm	45 mm	45 mm	70 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm	75 mm
Weights						
Weight, approx.	180 g	220 g	220 g	190 g	260 g	310 g

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Overview



- Digital outputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Selection and ordering data

SB 1222 digital output signal board	
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 5 V DC 200 kHz	**6ES7222-1AD30-0XB0**
SIMATIC S7-1200, SB 1222 digital output module 4 DQ, 24 V DC 200 kHz	**6ES7222-1BD30-0XB0**
Terminal block (spare part)	
SIMATIC S7-1200, spare part gold-plated I/O terminal block Signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7222-1AD30-0XB0 Signal Board SB1222, 4 DQ 5VDC 200KHz	6ES7222-1BD30-0XB0 Signal Board SB1222, 4 DQ 24VDC 200KHz
General information		
Product type designation	SB 1222, DQ 4x5 V DC 200 kHz	SB 1222, DQ 4x24 V DC 200 kHz
Input current		
from backplane bus 5 V DC, typ.	35 mA	35 mA
Digital outputs		
Number of digital outputs	4; MOSFET, solid-state (current-sinking/current-sourcing)	4; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	4	4
Short-circuit protection	No	No
Switching capacity of the outputs		
• with resistive load, max.	0.1 A	0.1 A
Load resistance range		
• upper limit		11 Ω
Output voltage		
• Rated value (DC)	5 V	24 V
• for signal "0", max.	0.2 V	1 V; with 10 kOhm load
• for signal "1", min.	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.	6 V	
Output current		
• for signal "1" rated value	0.1 A	0.1 A
Interrupts/diagnostics/status information		
Diagnostics indication LED		
• for status of the outputs	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weights		
Weight, approx.	35 g	35 g

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Overview



- Digital inputs and outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs and outputs

Selection and ordering data

SM 1223 digital input/output signal module	
SIMATIC S7-1200, SM 1223 digital input/output module 8 DI/8 DO, 8 DI 24 V DC, sink/source, 8 DO, transistor 0.5 A	**6ES7223-1BH32-0XB0**
SIMATIC S7-1200, SM 1223 digital input/output module 16 DI/16 DO, 16 DI 24 V DC, sink/source, 16 DO, transistor 0.5 A	**6ES7223-1BL32-0XB0**
SIMATIC S7-1200, SM 1223 digital input/output module 16 DI/16 DO, 16 DI 24 V DC, sourcing/sinking input, 16 DO, sinking output, NPN transistor 0.5 A	**6ES7223-1BL32-1XB0**
SIMATIC S7-1200, SM 1223 digital input/output module 8 DI/8 DO, 8 DI 24 V DC, sink/source, 8 DO, relay 2 A	**6ES7223-1PH32-0XB0**
SIMATIC S7-1200, SM 1223 digital input/output module 16 DI/16 DO, 16 DI 24 V DC, sink/source, 16 DO, relay 2 A	**6ES7223-1PL32-0XB0**
SIMATIC S7-1200, SM 1223 digital input/output module 8 DI AC/8 DO RLY, 8 DI 120/230 V AC, 8 DO relay 2 A	**6ES7223-1QH32-0XB0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part)	
For 6ES7223-1BH32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 8CH/16CH (4 units with 7 screws each)	**6ES7292-1AG30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for digital signal modules 8CH/16CH (4 units with 7 pins each)	**6ES7292-2AG30-0XA0**
For 6ES7223-1BL32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 32CH (4 units with 11 screws each)	**6ES7292-1AL30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for digital signal modules 32CH (4 units with 11 pins each)	**6ES7292-2AL30-0XA0**
For 6ES7223-1PH32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 8CH/16CH (4 units with 7 screws each)	**6ES7292-1AG30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for digital signal modules 8CH/16CH (4 units with 7 pins each)	**6ES7292-2AG30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded, for digital signal modules 8CH/16CH, (4 units with 7 screws each)	**6ES7292-1AG40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded, for digital signal modules 8CH/16CH, (4 units with 7 pins each)	**6ES7292-2AG40-0XA0**
For 6ES7223-1PL32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 32CH (4 units with 11 screws each)	**6ES7292-1AL30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for digital signal modules 32CH (4 units with 11 pins each)	**6ES7292-2AL30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, digital signal module 32CH (4 units with 11 screws each)	**6ES7292-1AL40-0XA0**

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Selection and ordering data (continued)

SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded right, for digital signal modules 32CH (4 units with 11 pins each)	**6ES7292-2AL40-0XA0**
For 6ES7223-1QH32-0XB0	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded, for digital signal modules 8CH/16CH, (4 units with 7 screws each)	**6ES7292-1AG40-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, encoded, for digital signal modules 8CH/16CH, (4 units with 7 pins each)	**6ES7292-2AG40-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**
SIMATIC S7-1200, spare part front flaps signal module 70 mm (signal module 70 mm wide front flap top & bottom) 6 units each	**6ES7291-1BB30-0XA0**

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Technical specifications

Article number	6ES7223-1BH32-0-XB0 Digital I/O SM 1223, 8 DI / 8 DO	6ES7223-1BL32-0X-B0 Digital I/O SM 1223, 16DI/16DO	6ES7223-1BL32-1X-B0 Digital I/O SM 1223, 16DI/16DO sink	6ES7223-1PH32-0-XB0 Digital I/O SM 1223, 8DI/8DO	6ES7223-1PL32-0X-B0 Digital I/O SM 1223, 16DI/16DO	6ES7223-1QH32-0-XB0 Digital I/O SM 1223, 8DI AC/ 8DO Rly
General information						
Product type designation	SM 1223, DI 8x24 V DC, DQ 8x24 V DC	SM 1223, DI 16x24 V DC, DQ 16x24 V DC	SM 1223, DI 16x24 V DC, DO 16x 24 V DC Sink	SM 1223, DI 8x24 V DC, DQ 8x relay	SM 1223, DI 16x24 V DC, DQ 16x relay	SM 1223, DI 8x120/230 V AC, DQ 8x relay
Supply voltage						
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
Input current						
from backplane bus 5 V DC, max.	145 mA	185 mA	185 mA	145 mA	180 mA	120 mA
Digital inputs						
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel	4 mA; per channel	4 mA/input 11 mA/relay	4 mA/input 11 mA/relay	
Output voltage						
Power supply to the transmitters						
• present	Yes	Yes	Yes	Yes	Yes	Yes
Digital inputs						
Number of digital inputs	8	16	16	8	16	8
• in groups of	2	2	2	2	2	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs						
- all mounting positions						
- up to 40 °C, max.	8	16	16	8	16	8
- horizontal installation						
- up to 40 °C, max.	8	16	16	8	16	8
- up to 50 °C, max.	8	16	16	8	16	8
- vertical installation						
- up to 40 °C, max.	8	16	16	8	16	8
Input voltage						
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	
• Rated value (AC)						120/230 V AC
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	20 V AC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	79 V AC at 2.5 mA
Input current						
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA	4 mA	9 mA
Input delay (for rated value of input voltage)						
- for standard inputs						
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs						
- Parameterizable	Yes	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7223-1BH32-0-XB0	6ES7223-1BL32-0X-B0	6ES7223-1BL32-1X-B0	6ES7223-1PH32-0-XB0	6ES7223-1PL32-0X-B0	6ES7223-1QH32-0-XB0
	Digital I/O SM 1223, 8 DI / 8 DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 16DI/16DO sink	Digital I/O SM 1223, 8DI/8DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 8DI AC/ 8DO Rly
Digital outputs						
Number of digital outputs	8	16	16; Transistor current sinking	8	16	8
• in groups of	1	1	1	2	4	4
Short-circuit protection	No; to be provided externally	No; to be provided externally	Yes; 1 to 3.5 A	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)	Typ 45 V			
Switching capacity of the outputs						
• with resistive load, max.	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage						
• Rated value (DC)	24 V	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)				5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load	L+ minus 0.75 V DC with 10k Load			
• for signal "1", min.	20 V DC	20 V DC	0,5 V			
Output current						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA	75 µA			
Output delay with resistive load						
• "0" to "1", max.	50 µs	50 µs	20 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	350 µs	10 ms	10 ms	10 ms
Total current of the outputs (per group)						
- horizontal installation						
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	8 A; Current per mass	10 A; Current per mass	8 A; Current per mass	8 A; Current per mass
Relay outputs						
• Number of relay outputs				8	16	8
• Rated supply voltage of relay coil L+ (DC)				24 V	24 V	24 V
• Number of operating cycles, max.				mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts						
- with inductive load, max.		0.5 A	0.5 A	2 A	2 A	2 A
- on lamp load, max.		5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.		0.5 A	0.5 A	2 A	2 A	2 A
Interrupts/diagnostics/status information						
Alarms						
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED						
• for status of the inputs	Yes	Yes	Yes	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes	Yes	Yes	Yes
Potential separation						
Potential separation digital outputs						
• between the channels and backplane bus	500 V AC	500 V AC	500 V AC	1 500 V AC for 1 minute	1 500 V AC for 1 minute	1 500 V AC for 1 minute

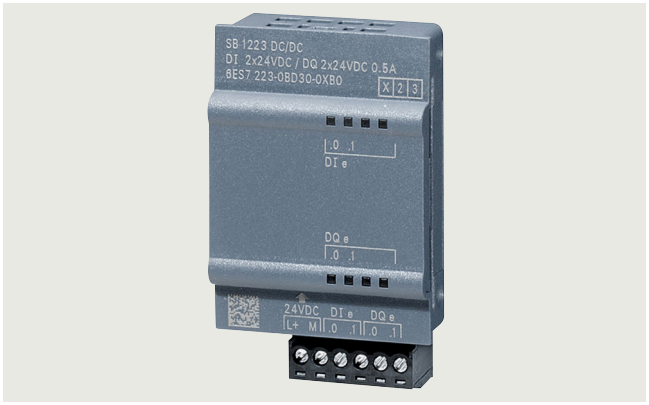
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Technical specifications (continued)

Article number	6ES7223-1BH32-0-XB0	6ES7223-1BL32-0X-B0	6ES7223-1BL32-1X-B0	6ES7223-1PH32-0-XB0	6ES7223-1PL32-0X-B0	6ES7223-1QH32-0-XB0
	Digital I/O SM 1223, 8 DI / 8 DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 16DI/16DO sink	Digital I/O SM 1223, 8DI/8DO	Digital I/O SM 1223, 16DI/16DO	Digital I/O SM 1223, 8DI AC/ 8DO Rly
Degree and class of protection						
IP degree of protection	IP20	IP20	IP20	IP20	IP20	IP20
Standards, approvals, certificates						
CE mark	Yes	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes	Yes
KC approval	Yes	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes	Yes	Yes
Ambient conditions						
Ambient temperature during operation						
• min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical
Connection method						
required front connector	Yes	Yes	Yes	Yes	Yes	Yes
Mechanics/material						
Enclosure material (front)						
• Plastic	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions						
Width	45 mm	70 mm	70 mm	45 mm	70 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm	75 mm
Weights						
Weight, approx.	210 g	310 g	310 g	230 g	350 g	230 g

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Overview



- Digital inputs and outputs as a supplement to the integral I/O of the SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Selection and ordering data

SB 1223 digital input/output signal board	
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DO, 2 DI 24 V DC/2 DO 24 V DC	**6ES7223-0BD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 5 V DC 200 kHz	**6ES7223-3AD30-0XB0**
SIMATIC S7-1200, SB 1223 digital input/output module 2 DI/2 DQ, 24 V DC 200 kHz	**6ES7223-3BD30-0XB0**
Terminal block (spare part)	
SIMATIC S7-1200, spare part gold-plated I/O terminal block Signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7223-0BD30-0XB0 Signal Board SB1223, 2 DI/2 DO	6ES7223-3AD30-0XB0 Signal Board SB 1223, 2DI/2DQ 5V 200KHz	6ES7223-3BD30-0XB0 Signal Board SB 1223, 2DI/2DQ 24V 200KHz
General information			
Product type designation	SB 1223, DI 2x24 V DC/DQ 2x24 V DC	SB 1223, DI 2x5 V DC/DQ 2x5 V DC 200 kHz	SB 1223, DI 2x24 V DC/DQ 2x24 V DC 200 kHz
Input current			
from backplane bus 5 V DC, typ.	50 mA	35 mA	35 mA
Output voltage			
Power supply to the transmitters			
• Supply current, max.	4 mA; per channel		
Digital inputs			
Number of digital inputs	2; Current-sinking	2; Current-sourcing	2; Current-sourcing
• in groups of	1	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes		
Number of simultaneously controllable inputs			
- all mounting positions			
- up to 40 °C, max.	2		2
Input voltage			
• Rated value (DC)	24 V	5 V	24 V
• for signal "0"	0 to 5 V	(L+ minus 1.0 V DC) ... L+	(L+ minus 5.0 V DC) ... L+
• for signal "1"	+15 to +30 V	0 V ... (L+ minus 2.0 V DC)	0 V ... (L+ minus 10 V DC)
Input current			
• for signal "0", max. (permissible quiescent current)	1 mA	2.2 mA	1.4 mA
• for signal "1", min.		5.1 mA	2.9 mA
• for signal "1", typ.	7 mA	15 mA	7 mA
Input delay (for rated value of input voltage)			
- for standard inputs			
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
- for interrupt inputs			
- Parameterizable	Yes	Yes	Yes
- for technological functions			
- Parameterizable	Yes	Yes	Yes
Digital outputs			
Number of digital outputs	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	1	2	2
Short-circuit protection	No	No	No
Switching capacity of the outputs			
• with resistive load, max.	0.5 A	0.1 A	0.1 A
• on lamp load, max.	5 W		
Load resistance range			
• upper limit	0.6 Ω	7 Ω	
Output voltage			
• Rated value (DC)	24 V	5 V	24 V
• for signal "0", max.	0.1 V; with 10 kOhm load	0.2 V	1 V
• for signal "1", min.	20 V	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.		6 V	
Output current			
• for signal "1" rated value	0.5 A	0.1 A	0.1 A
• for signal "0" residual current, max.	10 µA		

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Technical specifications (continued)

Article number	6ES7223-0BD30-0XB0 Signal Board SB1223, 2 DI/2 DO	6ES7223-3AD30-0XB0 Signal Board SB 1223, 2DI/2DQ 5V 200KHz	6ES7223-3BD30-0XB0 Signal Board SB 1223, 2DI/2DQ 24V 200KHz
Interrupts/diagnostics/status information			
Alarms	Yes		
Diagnostics function	Yes		
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
cULus	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes
KC approval	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Mechanics/material			
Enclosure material (front)			
• plastic	Yes	Yes	Yes
Dimensions			
Width	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm
Weights			
Weight, approx.	40 g	35 g	35 g

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Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

	Article No.
SIPLUS SM 1221 digital input signal module	
(Extended temperature range and exposure to environmental substances)	
8 inputs, 24 V DC, isolated, sinking/sourcing output	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1221-1BF32-4XB0**
• -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1221-1BF32-2XB0**
16 inputs, 24 V DC, isolated, sinking/sourcing output	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1221-1BH32-4XB0**
• -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%	**6AG1221-1BH32-2XB0**
Accessories	See SIMATIC S7-1200 SM 1221 digital input modules

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Technical specifications

Article number	6AG1221-1BF32-2XB0 SIPLUS S7-1200 SM 1221 8DI	6AG1221-1BF32-4XB0 SIPLUS S7-1200 SM 1221 8DI	6AG1221-1BH32-2XB0 SIPLUS S7-1200 SM 1221 16DI	6AG1221-1BH32-4XB0 SIPLUS S7-1200 SM 1221 16DI
General information				
Product type designation	SM 1221, DI 8x24 V DC	SM 1221, DI 8x24 V DC	SM 1221, DI 16x24 V DC	SM 1221, DI 16x24 V DC
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Input current				
from backplane bus 5 V DC, max.	105 mA	105 mA	130 mA	130 mA
Digital inputs				
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel	4 mA; per channel	4 mA; per channel
Output voltage				
Power supply to the transmitters				
• present	Yes	Yes	Yes	Yes
Digital inputs				
Number of digital inputs	8	8	16	16
• in groups of	2	2	4	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes
Input voltage				
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA
Input current				
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA
Input delay (for rated value of input voltage)				
- for standard inputs				
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs				
- Parameterizable	Yes	Yes	Yes	Yes
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes		
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Degree and class of protection				
IP degree of protection	IP20	IP20	IP20	IP20

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Technical specifications (continued)

Article number	6AG1221-1BF32-2XB0 SIPLUS S7-1200 SM 1221 8DI	6AG1221-1BF32-4XB0 SIPLUS S7-1200 SM 1221 8DI	6AG1221-1BH32-2XB0 SIPLUS S7-1200 SM 1221 16DI	6AG1221-1BH32-4XB0 SIPLUS S7-1200 SM 1221 16DI
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes	Yes
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1221-1BF32-2XB0 SIPLUS S7-1200 SM 1221 8DI	6AG1221-1BF32-4XB0 SIPLUS S7-1200 SM 1221 8DI	6AG1221-1BH32-2XB0 SIPLUS S7-1200 SM 1221 16DI	6AG1221-1BH32-4XB0 SIPLUS S7-1200 SM 1221 16DI
Connection method				
required front connector	Yes	Yes	Yes	Yes
Mechanics/material				
Enclosure material (front)				
• plastic	Yes	Yes	Yes	Yes
Dimensions				
Width	45 mm	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
Weights				
Weight, approx.	170 g	170 g	210 g	210 g

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Overview



- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SB 1221 digital input signal board (Extended temperature range and exposure to environmental substances)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**
Accessories	See SIMATIC S7-1200 SB 1221 digital input modules

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Technical specifications

Article number	6AG1221-3AD30-5XB0 SIPLUS S7-1200 SB 1221 4DI 5VDC	6AG1221-3BD30-5XB0 SIPLUS S7-1200 SB 1221 4DI 24VDC
General information		
Product type designation	SB 1221, DI 4x5 V DC 200 kHz	SB 1221, DI 4x24 V DC 200 kHz
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Input current		
from backplane bus 5 V DC, typ.	40 mA	40 mA
Digital inputs		
Number of digital inputs	4; Current-sourcing	4; Current-sourcing
• in groups of	4	4
Input voltage		
• Rated value (DC)	5 V	24 V
• for signal "0"	(L+ minus 1.0 V DC) ... L+ (2.2 ... 0 mA)	(L+ minus 5.0 V DC) ... L+ (1.4 ... 0 mA)
• for signal "1"	0 V ... (L+ minus 2.0 V DC (20 ... 5.1 mA))	0 V ... (L+ minus 10 V DC (10 ... 2.9 mA))
Input current		
• for signal "0", max. (permissible quiescent current)	2.2 mA	1.4 mA
• for signal "1", min.	5.1 mA	2.9 mA
• for signal "1", typ.	15 mA	7 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
- for interrupt inputs		
- Parameterizable	Yes	Yes
- for technological functions		
- Parameterizable	Yes	Yes
Interrupts/diagnostics/status information		
Diagnostics indication LED		
• for status of the inputs	Yes	Yes

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Technical specifications (continued)

Article number	6AG1221-3AD30-5XB0 SIPLUS S7-1200 SB 1221 4DI 5VDC	6AG1221-3BD30-5XB0 SIPLUS S7-1200 SB 1221 4DI 24VDC
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Mechanics/material		
Enclosure material (front)		
• plastic		Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weights		
Weight, approx.	35 g	35 g

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

	Article No.
SIPLUS SM 1222 digital output signal module	
(Extended temperature range and exposure to environmental substances)	
8 outputs, 24 V DC; 0.5 A, 5 W, isolated	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1222-1BF32-4XB0**
• -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1BF32-2XB0**
16 outputs, 24 V DC; 0.5 A, 5 W, isolated	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1222-1BH32-4XB0**
• -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1BH32-2XB0**
8 outputs, 5 ... 30 V DC/5 ... 250 V AC, relay 2 A, 30 W DC/200 W AC	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1222-1HF32-4XB0**
• -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1HF32-2XB0**
8 relay outputs, changeover contact, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1222-1XF32-4XB0**
• -40 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1XF32-2XB0**
16 outputs, 5 ... 30 V DC/5 ... 250 V AC, relay 2 A, 30 W DC/200 W AC	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1222-1HH32-4XB0**
• -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1HH32-2XB0**
Accessories	See SIMATIC S7-1200 SM 1222 digital output modules

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Technical specifications

Article number	6AG1222-1HF32-2XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1HF32-4XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1XF32-2XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1XF32-4XB0 SIPLUS S7-1200 SM 1222 8DQ RLY
General information				
Product type designation	SM 1222, DQ 8x relay/2 A	SM 1222, DQ 8x relay/2 A	SM 1222, DQ 8x relay/2 A	SM 1222, DQ 8x relay/2 A
Input current				
from backplane bus 5 V DC, max.	120 mA	120 mA	140 mA	140 mA
Digital outputs				
• from load voltage L+, max.	11 mA/relay coil	11 mA/relay coil	16.7 mA/relay coil	16.7 mA/relay coil
Digital outputs				
Number of digital outputs	8	8	8	8
• in groups of	2	2	1	1
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Switching capacity of the outputs				
• with resistive load, max.	2 A	2 A	2 A	2 A
• on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage				
• Rated value (DC)	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
Output current				
• for signal "1" rated value	2 A	2 A	2 A	2 A
Output delay with resistive load				
• "0" to "1", max.	10 ms	10 ms	10 ms	10 ms
• "1" to "0", max.	10 ms	10 ms	10 ms	10 ms
Total current of the outputs (per group)				
- horizontal installation				
- up to 50 °C, max.	10 A; Current per mass	10 A; Current per mass	2 A; Current per mass	2 A; Current per mass
Relay outputs				
• Number of relay outputs	8	8	8	8
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V	24 V	24 V
• Number of operating cycles, max.	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts				
- with inductive load, max.	2 A	2 A	2 A	2 A
- on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.	2 A	2 A	2 A	2 A
Interrupts/diagnostics/status information				
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• for status of the outputs	Yes	Yes	Yes	Yes
Potential separation				
Potential separation digital outputs				
• between the channels and backplane bus	1 500 V AC for 1 minute	1 500 V AC for 1 minute	1 500 V AC for 1 minute	1 500 V AC for 1 minute
Degree and class of protection				
IP degree of protection	IP20	IP20	IP20	IP20
Standards, approvals, certificates				
Marine approval			Yes	Yes

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Technical specifications (continued)

Article number	6AG1222-1HF32-2XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1HF32-4XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1XF32-2XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1XF32-4XB0 SIPLUS S7-1200 SM 1222 8DQ RLY
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1222-1HF32-2XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1HF32-4XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1XF32-2XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6AG1222-1XF32-4XB0 SIPLUS S7-1200 SM 1222 8DQ RLY
Connection method				
required front connector	Yes	Yes	Yes	Yes
Mechanics/material				
Enclosure material (front)				
• plastic	Yes	Yes	Yes	Yes
Dimensions				
Width	45 mm	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
Weights				
Weight, approx.	190 g	190 g	310 g	310 g

Article number	6AG1222-1HH32-2XB0 SIPLUS S7-1200 SM 1222 16DQ RLY	6AG1222-1HH32-4XB0 SIPLUS S7-1200 SM 1222 16DQ RLY
General information		
Product type designation	SM 1222, DQ 16x relay/2 A	SM 1222, DQ 16x relay/2 A
Input current		
from backplane bus 5 V DC, max.	135 mA	135 mA
Digital outputs		
• from load voltage L+, max.	11 mA/relay coil	11 mA/relay coil
Digital outputs		
Number of digital outputs	16	16
• in groups of	1	1
Short-circuit protection	No; to be provided externally	No; to be provided externally
Switching capacity of the outputs		
• with resistive load, max.	2 A	2 A
• on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage		
• Rated value (DC)	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC	5 V AC to 250 V AC
Output current		
• for signal "1" rated value	2 A	2 A
Output delay with resistive load		
• "0" to "1", max.	10 ms	10 ms
• "1" to "0", max.	10 ms	10 ms
Total current of the outputs (per group)		
- horizontal installation		
- up to 50 °C, max.	10 A; Current per mass	10 A; Current per mass
Relay outputs		
• Number of relay outputs	16	16
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V
• Number of operating cycles, max.	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts		
- with inductive load, max.	2 A	2 A
- on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.	2 A	2 A
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostics indication LED		
• for status of the outputs	Yes	Yes
Potential separation		
Potential separation digital outputs		
• between the channels and backplane bus	1 500 V AC for 1 minute	1 500 V AC for 1 minute

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Technical specifications (continued)

Article number	6AG1222-1HH32-2XB0 SIPLUS S7-1200 SM 1222 16DQ RLY	6AG1222-1HH32-4XB0 SIPLUS S7-1200 SM 1222 16DQ RLY
Degree and class of protection		
IP degree of protection	IP20	IP20
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	260 g	260 g

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- Can be plugged directly into the CPU
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to environmental substances)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**
Accessories	See SIMATIC S7-1200 SB 1222 digital output modules

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Technical specifications

Article number	6AG1222-1AD30-5XB0 SIPLUS S7-1200 SB 1222 4DQ 5VDC	6AG1222-1BD30-5XB0 SIPLUS S7-1200 SB 1222 4DQ 24VDC
General information		
Product type designation	SB 1222, DQ 4x5 V DC 200 kHz	SB 1222, DQ 4x24 V DC 200 kHz
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Input current		
from backplane bus 5 V DC, typ.	35 mA	35 mA
Digital outputs		
Number of digital outputs	4; MOSFET, solid-state (current-sinking/current-sourcing)	4; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	4	4
Short-circuit protection	No	No
Switching capacity of the outputs		
• with resistive load, max.	0.1 A	0.1 A
Load resistance range		
• upper limit		11 Ω
Output voltage		
• Rated value (DC)	5 V	24 V
• for signal "0", max.	0.2 V	1 V; with 10 kOhm load
• for signal "1", min.	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.	6 V	
Output current		
• for signal "1" rated value	0.1 A	0.1 A
Interrupts/diagnostics/status information		
Alarms	Yes	
Diagnostics function	Yes	
Diagnostics indication LED		
• for status of the outputs	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)

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Technical specifications (continued)

Article number	6AG1222-1AD30-5XB0 SIPLUS S7-1200 SB 1222 4DQ 5VDC	6AG1222-1BD30-5XB0 SIPLUS S7-1200 SB 1222 4DQ 24VDC
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weights		
Weight, approx.	35 g	35 g

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Overview



- Digital inputs and outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs and outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

	Article No.
SIPLUS SM 1223 digital input/output signal module	
(Extended temperature range and exposure to environmental substances)	
8 inputs, 24 V DC, IEC type 1 sinking input; 8 x 24 V DC transistor outputs, 0.5 A, 5 W	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-1BH32-4XB0**
• -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%	**6AG1223-1BH32-2XB0**
16 inputs, 24 V DC, IEC type 1 sinking input; 16 x 24 V DC transistor outputs, 0.5 A, 5 W	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-1BL32-4XB0**
• -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%	**6AG1223-1BL32-2XB0**
8 inputs, 24 V DC, IEC type 1 sinking input; 8 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-1PH32-4XB0**
• -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%	**6AG1223-1PH32-2XB0**
16 inputs, 24 V DC, IEC type 1 sinking input; 16 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-1PL32-4XB0**
• -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%	**6AG1223-1PL32-2XB0**
8 inputs, 120/230 V AC; 8 relay outputs, 5 ... 30 V DC/5 ... 250 V AC, 2 A, 30 W DC/200 W AC	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-1QH32-4XB0**
-40 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%	**6AG1223-1QH32-2XB0**
Accessories	See SIMATIC S7-1200 SM 1223 digital input/output modules

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Technical specifications

Article number	6AG1223-1BH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1BH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1PH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	6AG1223-1PH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
General information				
Product type designation	SM 1223, DI 8x24 V DC, DQ 8x24 V DC	SM 1223, DI 8x24 V DC, DQ 8x24 V DC	SM 1223, DI 8x24 V DC, DQ 8x relay	SM 1223, DI 8x24 V DC, DQ 8x relay
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Input current				
from backplane bus 5 V DC, max.	145 mA	145 mA	145 mA	145 mA
Digital inputs				
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel	4 mA/input 11 mA/relay	4 mA/input 11 mA/relay
Output voltage				
Power supply to the transmitters				
• present	Yes	Yes	Yes	Yes
Digital inputs				
Number of digital inputs	8	8	8	8
• in groups of	2	2	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs				
- all mounting positions				
- up to 40 °C, max.	8	8	8	8
- horizontal installation				
- up to 40 °C, max.	8	8	8	8
- up to 50 °C, max.	8	8	8	8
- vertical installation				
- up to 40 °C, max.	8	8	8	8
Input voltage				
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA
Input current				
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA
Input delay (for rated value of input voltage)				
- for standard inputs				
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs				
- Parameterizable	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1223-1BH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1BH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1PH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	6AG1223-1PH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
Digital outputs				
Number of digital outputs	8	8	8	8
• in groups of	1	1	2	2
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)		
Switching capacity of the outputs				
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage				
• Rated value (DC)	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)			5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load		
• for signal "1", min.	20 V DC	20 V DC		
Output current				
• for signal "1" rated value	0.5 A	0.5 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA		
Output delay with resistive load				
• "0" to "1", max.	50 µs	50 µs	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	10 ms	10 ms
Total current of the outputs (per group)				
- horizontal installation				
- up to 50 °C, max.	4 A; Current per mass	4 A; Current per mass	10 A; Current per mass	10 A; Current per mass
Relay outputs				
• Number of relay outputs			8	8
• Rated supply voltage of relay coil L+ (DC)			24 V	24 V
• Number of operating cycles, max.			mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts				
- with inductive load, max.			2 A	2 A
- on lamp load, max.			30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.			2 A	2 A
Interrupts/diagnostics/status information				
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• for status of the inputs	Yes	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes	Yes
Potential separation				
Potential separation digital outputs				
• between the channels and backplane bus	500 V AC	500 V AC	1 500 V AC for 1 minute	1 500 V AC for 1 minute
Degree and class of protection				
IP degree of protection	IP20	IP20	IP20	IP20

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Technical specifications (continued)

Article number	6AG1223-1BH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1BH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1PH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	6AG1223-1PH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes	Yes
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1223-1BH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1BH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1PH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	6AG1223-1PH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
Connection method				
required front connector	Yes	Yes	Yes	Yes
Mechanics/material				
Enclosure material (front)				
• plastic	Yes	Yes	Yes	Yes
Dimensions				
Width	45 mm	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
Weights				
Weight, approx.	210 g	210 g	230 g	230 g

Article number	6AG1223-1QH32-2XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY	6AG1223-1QH32-4XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY
General information		
Product type designation	SM 1223, DI 8x120/230 V AC, DQ 8x relay	SM 1223, DI 8x120/230 V AC, DQ 8x relay
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
from backplane bus 5 V DC, max.	120 mA	120 mA
Output voltage		
Power supply to the transmitters		
• present	Yes	Yes
Digital inputs		
Number of digital inputs	8	8
• in groups of	4	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 40 °C, max.	8	8
- horizontal installation		
- up to 40 °C, max.	8	8
- up to 50 °C, max.	8	8
- vertical installation		
- up to 40 °C, max.	8	8
Input voltage		
• Rated value (AC)	120/230 V AC	120/230 V AC
• for signal "0"	20 V AC at 1 mA	20 V AC at 1 mA
• for signal "1"	79 V AC at 2.5 mA	79 V AC at 2.5 mA
Input current		
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA
• for signal "1", typ.	9 mA	9 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs		
- Parameterizable	Yes	Yes

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Technical specifications (continued)

Article number	6AG1223-1QH32-2XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY	6AG1223-1QH32-4XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY
Digital outputs		
Number of digital outputs	8	8
• in groups of	4	4
Short-circuit protection	No; to be provided externally	No; to be provided externally
Switching capacity of the outputs		
• with resistive load, max.	2 A	2 A
• on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage		
• Rated value (DC)	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC	5 V AC to 250 V AC
Output current		
• for signal "1" rated value	2 A	2 A
Output delay with resistive load		
• "0" to "1", max.	10 ms	10 ms
• "1" to "0", max.	10 ms	10 ms
Total current of the outputs (per group)		
- horizontal installation		
- up to 50 °C, max.	8 A; Current per mass	8 A; Current per mass
Relay outputs		
• Number of relay outputs	8	8
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V
• Number of operating cycles, max.	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts		
- with inductive load, max.	2 A	2 A
- on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.	2 A	2 A
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for status of the outputs	Yes	Yes
Potential separation		
Potential separation digital outputs		
• between the channels and backplane bus	1 500 V AC for 1 minute	1 500 V AC for 1 minute
Degree and class of protection		
IP degree of protection	IP20	IP20

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Technical specifications (continued)

Article number	6AG1223-1QH32-2XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY	6AG1223-1QH32-4XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	230 g	230 g

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Overview



- Digital inputs and outputs as a supplement to the integral I/O of the SIPLUS S7-1200-CPUs
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to environmental substances)	
2 inputs, 24 V DC, IEC type 1 sinking input; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**
Accessories	See SIMATIC S7-1200 SB 1223 digital input/output modules

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Technical specifications

Article number	6AG1223-0BD30-4XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6AG1223-0BD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6AG1223-3AD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	6AG1223-3BD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
General information				
Product type designation	SB 1223, DI 2x24 V DC/DQ 2x24 V DC	SB 1223, DI 2x24 V DC/DQ 2x24 V DC	SB 1223, DI 2x5 V DC/DQ 2x5 V DC 200 kHz	SB 1223, DI 2x24 V DC/DQ 2x24 V DC 200 kHz
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Input current				
from backplane bus 5 V DC, typ.	50 mA	50 mA	35 mA	35 mA
Output voltage				
Power supply to the transmitters				
• Supply current, max.	4 mA; per channel	4 mA; per channel		
Digital inputs				
Number of digital inputs	2; Current-sinking	2; Current-sinking	2; Current-sourcing	2; Current-sourcing
• in groups of	1	1	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes		
Number of simultaneously controllable inputs				
- all mounting positions				
- up to 40 °C, max.	2	2		2
Input voltage				
• Rated value (DC)	24 V	24 V	5 V	24 V
• for signal "0"	0 to 5 V	0 to 5 V	(L+ minus 1.0 V DC) ... L+	(L+ minus 5.0 V DC) ... L+
• for signal "1"	+15 to +30 V	+15 to +30 V	0 V ... (L+ minus 2.0 V DC)	0 V ... (L+ minus 10 V DC)
Input current				
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	2.2 mA	1.4 mA
• for signal "1", min.			5.1 mA	2.9 mA
• for signal "1", typ.	7 mA	7 mA	15 mA	7 mA
Input delay (for rated value of input voltage)				
- for standard inputs				
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
- for interrupt inputs				
- Parameterizable	Yes	Yes	Yes	Yes
- for technological functions				
- Parameterizable	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1223-0BD30-4XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6AG1223-0BD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6AG1223-3AD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	6AG1223-3BD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
Digital outputs				
Number of digital outputs	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	1	1	2	2
Short-circuit protection	No	No	No	No
Switching capacity of the outputs				
• with resistive load, max.	0.5 A	0.5 A	0.1 A	0.1 A
• on lamp load, max.	5 W	5 W		
Load resistance range				
• upper limit	0.6 Ω	0.6 Ω	7 Ω	
Output voltage				
• Rated value (DC)	24 V	24 V	5 V	24 V
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load	0.2 V	1 V
• for signal "1", min.	20 V	20 V	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.			6 V	
Output current				
• for signal "1" rated value	0.5 A	0.5 A	0.1 A	0.1 A
• for signal "0" residual current, max.	10 µA	10 µA		
Interrupts/diagnostics/status information				
Alarms	Yes	Yes		
Diagnostics function	Yes	Yes		
Diagnostics indication LED				
• for status of the inputs	Yes	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1223-0BD30-4XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6AG1223-0BD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6AG1223-3AD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	6AG1223-3BD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost permitted (no commissioning in bedewed state)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1223-0BD30-4XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6AG1223-0BD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6AG1223-3AD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	6AG1223-3BD30-5XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
Mechanics/material				
Enclosure material (front)				
• plastic	Yes		Yes	Yes
Dimensions				
Width	38 mm	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm	21 mm
Weights				
Weight, approx.	40 g	40 g	35 g	35 g

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Overview



- Analog inputs for SIMATIC S7-1200
- With extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks

Selection and ordering data

SM 1231 analog input signal module	
SIMATIC S7-1200, analog input, SM 1231 4 AI, +/-10 V, +/-5 V, +/-2.5 V, +/-1.25 or 0-20 mA/4-20 mA, 15-bit+sign bit	**6ES7231-5ND32-0XB0**
SIMATIC S7-1200, analog input, SM 1231 4 AI, +/-10 V, +/-5 V, +/-2.5 V, or 0-20 mA/4-20 mA, 12-bit+sign (13-bit ADC)	**6ES7231-4HD32-0XB0**
SIMATIC S7-1200, analog input, SM 1231 8 AI, +/-10 V, +/-5 V, +/-2.5 V, or 0-20 mA/4-20 mA, 12-bit+sign or (13-bit ADC)	**6ES7231-4HF32-0XB0**
Accessories	
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part) For 6ES7231-5ND32-0XB0, 6ES7231-4HD32-0XB0, 6ES7231-4HF32-0XB0	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block 8CH/16CH analog signal module (4 units with 7 screws each)	**6ES7292-1BG30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for 8CH/16CH analog signal module (4 units with 7 pins each)	**6ES7292-2BG30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**

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Technical specifications

Article number	6ES7231-4HD32-0XB0 Analog Input SM 1231, 4AI	6ES7231-4HF32-0XB0 Analog Input SM 1231, 8AI	6ES7231-5ND32-0XB0 Analog Input SM 1231, 4AI 16bit
General information			
Product type designation	SM 1231, AI 4x13 bit	SM 1231, AI 8x13 bit	SM 1231, AI 4x16 bit
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Input current			
Current consumption, typ.	45 mA	60 mA	65 mA
from backplane bus 5 V DC, typ.	80 mA	90 mA	80 mA
Analog inputs			
Number of analog inputs	4; Current or voltage differential inputs	8; Current or voltage differential inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V	35 V	±35 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA
Cycle time (all channels) max.	625 µs	625 µs	100 µs
Input ranges			
• Voltage	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V or ±1.25V
• Current	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No	No	No
• Resistance thermometer	No	No	No
• Resistance	No	No	No
Input ranges (rated values), voltages			
• -1.25 V to +1.25 V			Yes
• -10 V to +10 V	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes	Yes
• -5 V to +5 V	Yes	Yes	Yes
Input ranges (rated values), currents			
• 0 to 20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
Thermocouple (TC)			
- Temperature compensation			
- Parameterizable		No	
Analog value generation for the inputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	12 bit; + sign	12 bit; + sign	15 bit; + sign
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values			
• Parameterizable	Yes	Yes	Yes
Errors/accuracies			
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1% / ±0.3% total measurement range
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
• Current, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Common mode voltage, max.	12 V	12 V	12 V

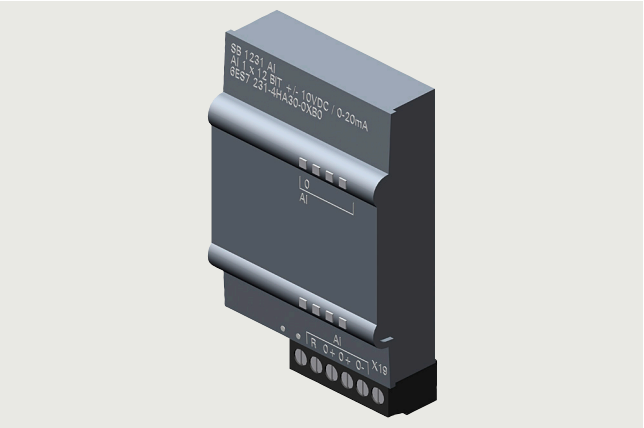
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Technical specifications (continued)

Article number	6ES7231-4HD32-0XB0 Analog Input SM 1231, 4AI	6ES7231-4HF32-0XB0 Analog Input SM 1231, 8AI	6ES7231-5ND32-0XB0 Analog Input SM 1231, 4AI 16bit
Interrupts/diagnostics/status information			
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes
Degree and class of protection			
IP degree of protection	IP20	IP20	IP20
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
cULus	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes
KC approval	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Connection method			
required front connector	Yes	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• Plastic	Yes	Yes	Yes
Dimensions			
Width	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	180 g	180 g	180 g

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Overview



- Analog input for SIMATIC S7-1200
- With extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks
- Can be plugged directly into the CPU

Selection and ordering data

SB 1231 analog input signal board	
SIMATIC S7-1200, analog input, SB 1231 1 AI, +/-10 V DC (12-bit resolution) or 0-20 mA	**6ES7231-4HA30-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7231-4HA30-0XB0 Signal Board SB 1231, 1 AI
General information	
Product type designation	SB 1231, AI 1x12 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
from backplane bus 5 V DC, typ.	55 mA
Analog inputs	
Number of analog inputs	1; Current or voltage differential inputs
permissible input voltage for current input (destruction limit), max.	±35 V
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for voltage input (destruction limit), max.	40 mA
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	156.25 µs; 400 Hz suppression
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	11 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Wire break	No
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes

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Technical specifications (continued)

Article number	6ES7231-4HA30-0XB0 Signal Board SB 1231, 1 AI
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

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Overview



- Analog outputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

Selection and ordering data

SM 1232 analog output signal module	
SIMATIC S7-1200, analog output, SM 1232 2 AO, +/-10 V, 14-bit resolution, or 0-20 mA/4-20 mA, 13-bit resolution	**6ES7232-4HB32-0XB0**
SIMATIC S7-1200, analog output, SM 1232 4 AO, +/-10 V, 14-bit resolution, or 0-20 mA/4-20 mA, 13-bit resolution	**6ES7232-4HD32-0XB0**
Accessories	
Terminal block (spare part) For 6ES7232-4HB32-0XB0, 6ES7232-4HD32-0XB0	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block 8CH/16CH analog signal module (4 units with 7 screws each)	**6ES7292-1BG30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for 8CH/16CH analog signal module (4 units with 7 pins each)	**6ES7292-2BG30-0XA0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**

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Technical specifications

Article number	6ES7232-4HB32-0XB0 Analog Output SM 1232, 2AO	6ES7232-4HD32-0XB0 Analog Output SM 1232, 4AO
General information		
Product type designation	SM 1232, AQ 2x14 bit	SM 1232, AQ 4x14 bit
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
Current consumption, typ.	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog outputs		
Number of analog outputs	2; Current or voltage	4; Current or voltage
Output ranges, voltage		
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 000 Ω	1 000 Ω
• with current outputs, max.	600 Ω	600 Ω
Cable length		
• shielded, max.	100 m; shielded, twisted pair	100 m; shielded, twisted pair
Analog value generation for the outputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit	14 bit; Voltage: 14 bit; Current : 13 bit
Errors/accuracies		
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Common mode voltage, max.	12 V	12 V
Interrupts/diagnostics/status information		
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
• short-circuit	Yes	Yes
Diagnostics indication LED		
• for status of the outputs	Yes	Yes
• for maintenance	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes

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Technical specifications (continued)

Article number	6ES7232-4HB32-0XB0 Analog Output SM 1232, 2AO	6ES7232-4HD32-0XB0 Analog Output SM 1232, 4AO
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	180 g	180 g

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Overview



- Analog output for SIMATIC S7-1200
- Can be plugged directly into the CPU

Selection and ordering data

SB 1232 analog output signal board	
SIMATIC S7-1200, analog output, SB 1232 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HA30-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7232-4HA30-0XB0 Signal Board SB 1232, 1 AO
General information	
Product type designation	SB 1232, AQ 1x12 bit
Input current	
from backplane bus 5 V DC, typ.	15 mA
Output voltage	
Power supply to the transmitters	
• Supply current, max.	25 mA
Analog inputs	
Number of analog inputs	0
Analog outputs	
Number of analog outputs	1
Cycle time (all channels) max.	Voltage: 300 µS (R), 750 µS (1 uF) Current: 600 ms (1 mH); 2 ms (10 mH)
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the outputs	
Conversion principle	Differential
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit
Errors/accuracies	
Temperature error (relative to output range), (+/-)	25 °C ±0.5%, to 55 °C ±1%
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• for status of the outputs	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g

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Overview



- Analog inputs and outputs for the SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks

Selection and ordering data

SM 1234 analog input/output signal module	
SIMATIC S7-1200, analog I/O SM 1234 4 AI/2 AO, +/-10 V, 14-bit resolution or 0 (4)-20 mA, 13-bit resolution	**6ES7234-4HE32-0XB0**
Accessories	
Terminal block (spare part) For 6ES7234-4HE32-0XB0	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block 8CH/16CH analog signal module (4 units with 7 screws each)	**6ES7292-1BG30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for 8CH/16CH analog signal module (4 units with 7 pins each)	**6ES7292-2BG30-0XA0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**

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Technical specifications

Article number	6ES7234-4HE32-0XB0 Analog I/O SM 1234, 4AI/2AO
General information	
Product type designation	SM 1234, AI 4x13 bit/AQ 2x14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
Analog inputs	
Number of analog inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	625 µs
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Analog outputs	
Number of analog outputs	2; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values	
• Parameterizable	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode voltage, max.	12 V

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Technical specifications (continued)

Article number	6ES7234-4HE32-0XB0 Analog I/O SM 1234, 4AI/2AO
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for status of the outputs	Yes
• for maintenance	Yes
Potential separation	
Potential separation analog outputs	
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	45 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	220 g

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Overview



- For convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant

Selection and ordering data

SM 1231 thermocouple module	
SIMATIC S7-1200, analog input, SM 1231 TC 4 AI thermocouples	**6ES7231-5QD32-0XB0**
SIMATIC S7-1200, analog input, SM 1231 TC 8 AI thermocouples	**6ES7231-5QF32-0XB0**
Accessories	
Terminal block (spare part) For 6ES7231-5QD32-0XB0, 6ES7231-5QF32-0XB0	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block 8CH/16CH analog signal module (4 units with 7 screws each)	**6ES7292-1BG30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for 8CH/16CH analog signal module (4 units with 7 pins each)	**6ES7292-2BG30-0XA0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**

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Technical specifications

Article number	6ES7231-5QD32-0XB0 S7-1200, analog Input SM 1231 TC, 4 AI	6ES7231-5QF32-0XB0 S7-1200, analog Input SM 1231 TC, 8 AI
General information		
Product type designation	SM 1231, AI 4x16 bit TC	SM 1231, AI 8x16 bit TC
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog inputs		
Number of analog inputs	4; Thermocouples	8; Thermocouples
permissible input voltage for voltage input (destruction limit), max.	±35 V	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
Input ranges		
• Voltage	Yes	Yes
• Current	No	No
• Thermocouple	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: ±80 mV	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
• Resistance thermometer	No	No
• Resistance	No	No
Input ranges (rated values), voltages		
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), thermocouples		
• type B	Yes	Yes
• type C	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
• Type T	Yes	Yes
• Type TXK/TXK(L) to GOST	Yes	Yes
Thermocouple (TC)		
- Temperature compensation		
- Parameterizable	No	No
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
Smoothing of measured values		
• Parameterizable	Yes	Yes
Errors/accuracies		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %	0.5 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Common mode interference, min.	120 dB	120 dB

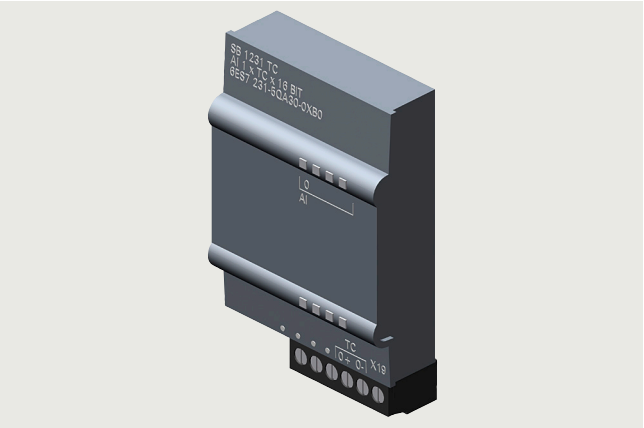
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Technical specifications (continued)

Article number	6ES7231-5QD32-0XB0 S7-1200, analog Input SM 1231 TC, 4 AI	6ES7231-5QF32-0XB0 S7-1200, analog Input SM 1231 TC, 8 AI
Interrupts/diagnostics/status information		
Alarms	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	180 g	220 g

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Overview



- For convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200, analog input, SB 1231 TC 1 AI thermocouples type J or K	**6ES7231-5QA30-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7231-5QA30-0XB0 Signal Board SB 1231 TC, 1 AI
General information	
Product type designation	SB 1231, AI 1x16 bit TC
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
Analog inputs	
Number of analog inputs	1; Thermocouples
permissible input voltage for current input (destruction limit), max.	±35 V
permissible input voltage for voltage input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	Yes
• Current	No
• Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -80 mV to +80 mV	Yes
Input ranges (rated values), thermocouples	
• Type J	Yes
• Type K	Yes
Thermocouple (TC)	
- Temperature compensation	
- Parameterizable	No
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes

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Technical specifications (continued)

Article number	6ES7231-5QA30-0XB0 Signal Board SB 1231 TC, 1 AI
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

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Overview

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature sensors can be used
- Can easily be retrofitted to existing installation

Selection and ordering data

SM 1231 RTD signal module	
SIMATIC S7-1200, analog input, SM 1231 RTD 4xAI RTD module	**6ES7231-5PD32-0XB0**
SIMATIC S7-1200, analog input, SM 1231 RTD 8xAI RTD module	**6ES7231-5PF32-0XB0**
Accessories	
Terminal block (spare part) For 6ES7231-5PD32-0XB0	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block 8CH/16CH analog signal module (4 units with 7 screws each)	**6ES7292-1BG30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology for 8CH/16CH analog signal module (4 units with 7 pins each) For 6ES7231-5PF32-0XB0	**6ES7292-2BG30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block 32CH analog signal module (4 units with 11 screws each)	**6ES7292-1BL30-0XA0**
SIMATIC S7-1200, spare part, gold-plated I/O terminal block In push-in technology, for 32CH analog signal module (4 units with 11 pins each)	**6ES7292-2BL30-0XA0**
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**
SIMATIC S7-1200, spare part front flaps signal module 70 mm (signal module 70 mm wide front flap top & bottom) 6 units each	**6ES7291-1BB30-0XA0**

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Technical specifications

Article number	6ES7231-5PD32-0XB0 S7-1200, analog Input SM 1231 RTD, 4 AI	6ES7231-5PF32-0XB0 S7-1200, analog Input SM 1231 RTD, 8 AI
General information		
Product type designation	SM 1231, AI 4x16 bit RTD	SM 1231, AI 8x16 bit RTD
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog inputs		
Number of analog inputs	4; Resistance thermometer	8; Resistance thermometer
permissible input voltage for voltage input (destruction limit), max.	±35 V	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
Input ranges		
• Voltage	No	No
• Current	No	No
• Thermocouple	No	No
• Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), resistance thermometer		
• Cu 10	Yes	Yes
• Ni 100	Yes	Yes
• Ni 1000	Yes	Yes
• LG-Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Ni 200	Yes	Yes
• Ni 500	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes
Input ranges (rated values), resistors		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
Thermocouple (TC)		
- Temperature compensation		
- Parameterizable	No	No
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
Errors/accuracies		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Common mode interference, min.	120 dB	120 dB

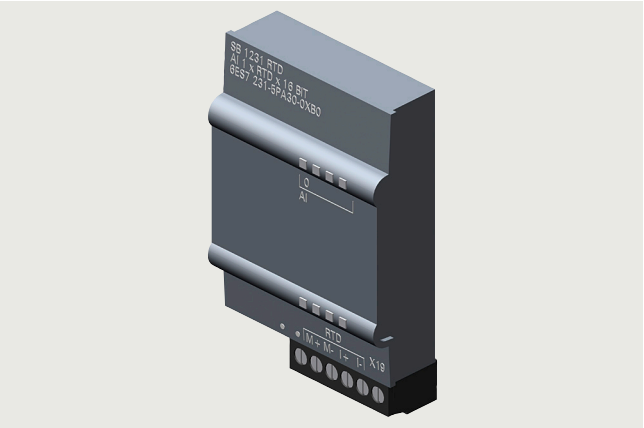
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Technical specifications (continued)

Article number	6ES7231-5PD32-0XB0 S7-1200, analog Input SM 1231 RTD, 4 AI	6ES7231-5PF32-0XB0 S7-1200, analog Input SM 1231 RTD, 8 AI
Interrupts/diagnostics/status information		
Alarms	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	70 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	220 g	220 g

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Overview



- For convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance-type temperature sensors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200, analog input, SB 1231RTD 1 AI RTD, PT 100 and PT1000	**6ES7231-5PA30-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7231-5PA30-0XB0 Signal Board SB 1231 RTD
General information	
Product type designation	SB 1231, AI 1x16 bit RTD
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
Analog inputs	
Number of analog inputs	1; Resistance thermometer
permissible input voltage for current input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	Yes
• Current	No
• Thermocouple	No
• Resistance thermometer	Yes; Platinum (Pt)
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), resistance thermometer	
• Pt 100	Yes
• Pt 1000	Yes
• Pt 200	Yes
• Pt 500	Yes
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
Thermocouple (TC)	
- Temperature compensation	
- Parameterizable	No
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes

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Technical specifications (continued)

Article number	6ES7231-5PA30-0XB0 Signal Board SB 1231 RTD
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

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Overview



- Energy management based on SIMATIC S7-1200
- Data acquisition of electrical characteristics in 1 and 3-phase networks up to 480 V AC
- Direct connection of voltage inputs
- Current measurement performed by 1 A and 5 A current transformers
- Can be used in TN and TT networks
- Data backup of measurement data in the event of a power failure

Selection and ordering data

SM 1238 Energy Meter 480 V AC analog input modules	
SIMATIC S7-1200, analog input, SM 1238 Energy Meter 480 V AC Energy measurement module for data acquisition in 1 and 3-phase networks (TN, TT) up to 480 V AC; current range: 1 A, 5 A; recording of voltage, current, phase angles, power ratings, energy values, frequencies; channel diagnostics	**6ES7238-5XA32-0XB0**
Accessories	
SIMATIC S7-1200, extension cable 2-tier configuration For SM 12XX, 2.0 m	**6ES7290-6AA30-0XA0**
Terminal block (spare part)	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Coded center, 7 pins for voltage terminal SM 1238 Energy Meter (4 units with 7 screws each)	**6ES7292-1AG40-0XA2**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, coded center, 7 pins for voltage terminal SM 1238 Energy Meter (4 units with 7 pins each)	**6ES7292-2AG40-0XA2**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 8CH/16CH (4 units with 7 screws each)	**6ES7292-1AG30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for digital signal modules 8CH/16CH (4 units with 7 pins each)	**6ES7292-2AG30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 45 mm (signal module 45 mm wide front flap top & bottom) 6 units each	**6ES7291-1BA30-0XA0**

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Technical specifications

Article number	6ES7238-5XA32-0XB0 SM 1238 Energy Meter 480V AC
General information	
Product type designation	SM 1238, AI energy meter 480 V AC
Product function	
• Voltage measurement	Yes
- with voltage transformer	Yes
• Current measurement	Yes
- without current transformer	No
- with current transformer	Yes
• Energy measurement	Yes
• Frequency measurement	Yes
• Power measurement	Yes
• Active power measurement	Yes
• Reactive power measurement	Yes
• I&M data	Yes; I&M 0
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1
Operating mode	
• cyclic measurement	Yes
• acyclic measurement	Yes
• Acyclic measured value access	Yes
• Fixed measured value sets	Yes
• Freely definable measured value sets	No
Installation type/mounting	
Mounting position	Horizontal, vertical
Supply voltage	
Design of the power supply	from CPU
Type of supply voltage	DC
Analog inputs	
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED

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Technical specifications (continued)

Article number	6ES7238-5XA32-0XB0 SM 1238 Energy Meter 480V AC
Integrated Functions	
Measuring functions	
• Measuring procedure for voltage measurement	TRMS
• Measuring procedure for current measurement	TRMS
• Type of measured value acquisition	seamless
• Curve shape of voltage	Sinusoidal or distorted
• Buffering of measured variables	Yes
• Parameter length	74 byte
• Bandwidth of measured value acquisition	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz
- Measuring range	
- Frequency measurement, min.	45 Hz
- Frequency measurement, max.	65 Hz
- Measuring inputs for voltage	
- Measurable line voltage between phase and neutral conductor	277 V
- Measurable line voltage between the line conductors	480 V
- Measurable line voltage between phase and neutral conductor, min.	0 V
- Measurable line voltage between phase and neutral conductor, max.	293 V
- Measurable line voltage between the line conductors, min.	0 V
- Measurable line voltage between the line conductors, max.	508 V
- Internal resistance line conductor and neutral conductor	3.4 MΩ
- Power consumption per phase	20 mW
- Impulse voltage resistance 1,2/50µs	1 kV
- Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II; CAT III in case of guaranteed protection level of 1.5 kV
- Measuring inputs for current	
- measurable relative current (AC), min.	1 %; Relative to the secondary rated current 5 A
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current 5 A
- Continuous current with AC, maximum permissible	5 A
- Apparent power consumption per phase for measuring range 5 A	0.6 VA
- Rated value short-time withstand current restricted to 1 s	100 A
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal
- Surge strength	10 A; for 1 minute
- Zero point suppression	Parameterizable: 2 ... 250 mA, default 50 mA
- Accuracy class according to IEC 61557-12	
- Measured variable voltage	0,2
- Measured variable current	0,2
- Measured variable apparent power	0.5
- Measured variable active power	0.5
- Measured variable reactive power	1
- Measured variable power factor	0.5
- Measured variable active energy	0.5
- Measured variable reactive energy	1
- Measured variable neutral current	0.5; calculated
- Measured variable phase angle	±1 °; not covered by IEC 61557-12
- Measured variable frequency	0.05
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes; 3 700V AC (type test) CAT III

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Technical specifications (continued)

Article number	6ES7238-5XA32-0XB0 SM 1238 Energy Meter 480V AC
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Dimensions	
Width	45 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	165 g
Other	
Data for selecting a current transformer	
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual

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Overview



- Analog inputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

	Article No.
SIPLUS SM 1231 analog input signal module	
(Extended temperature range and exposure to environmental substances)	
Range of ambient temperature 0 ... +55 °C	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 16-bit	**6AG1231-5ND32-4XB0**
4 analog inputs ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA; 12-bit + sign	**6AG1231-4HD32-4XB0**
8 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12-bit + sign	**6AG1231-4HF32-4XB0**
Accessories	See SIMATIC S7-1200 SM 1231 analog input modules

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Technical specifications

Article number	6AG1231-4HD32-4XB0	6AG1231-4HF32-4XB0	6AG1231-5ND32-4XB0
	SIPLUS S7-1200 SM 1231 4AI 13Bit	SIPLUS S7-1200 SM 1231 8AI 13Bit	SIPLUS S7-1200 SM 1231 4AI 16Bit
General information			
Product type designation	SM 1231, AI 4x13 bit	SM 1231, AI 8x13 bit	SM 1231, AI 4x16 bit
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Input current			
Current consumption, typ.	45 mA	45 mA	65 mA
from backplane bus 5 V DC, typ.	80 mA	90 mA	80 mA
Analog inputs			
Number of analog inputs	4; Current or voltage differential inputs	8; Current or voltage differential inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V	35 V	35 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA
Cycle time (all channels) max.	625 µs	625 µs	625 µs
Input ranges			
• Voltage	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V or ±1.25V
• Current	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No	No	No
• Resistance thermometer	No	No	No
• Resistance	No	Yes	Yes
Input ranges (rated values), voltages			
• -1.25 V to +1.25 V			Yes
• -10 V to +10 V	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes	Yes
• -5 V to +5 V	Yes	Yes	Yes
Input ranges (rated values), currents			
• 0 to 20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
Thermocouple (TC)			
- Temperature compensation			
- Parameterizable		No	
Analog value generation for the inputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	12 bit; + sign	12 bit; + sign	15 bit; + sign
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values			
• Parameterizable	Yes	Yes	Yes
Errors/accuracies			
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1% / ±0.3% total measurement range
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
• Current, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Common mode voltage, max.	12 V	12 V	12 V

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Technical specifications (continued)

Article number	6AG1231-4HD32-4XB0 SIPLUS S7-1200 SM 1231 4AI 13Bit	6AG1231-4HF32-4XB0 SIPLUS S7-1200 SM 1231 8AI 13Bit	6AG1231-5ND32-4XB0 SIPLUS S7-1200 SM 1231 4AI 16Bit
Interrupts/diagnostics/status information			
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes
Degree and class of protection			
IP degree of protection	IP20	IP20	IP20
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	6AG1231-4HD32-4XB0	6AG1231-4HF32-4XB0	6AG1231-5ND32-4XB0
	SIPLUS S7-1200 SM 1231 4AI 13Bit	SIPLUS S7-1200 SM 1231 8AI 13Bit	SIPLUS S7-1200 SM 1231 4AI 16Bit
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method			
required front connector	Yes	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• plastic	Yes	Yes	Yes
Dimensions			
Width	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	180 g	180 g	180 g

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Overview



- Analog outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the outputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

	Article No.
SIPLUS SM 1232 analog output signal module	
(Extended temperature range and exposure to environmental substances)	
Range of ambient temperature -20 ... +60 °C	
2 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit	**6AG1232-4HB32-4XB0**
4 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit	**6AG1232-4HD32-4XB0**
Range of ambient temperature -40 ... +70 °C	
4 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit	**6AG1232-4HD32-2XB0**
Accessories	See SIMATIC S7-1200 SM 1232 analog output modules

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Technical specifications

Article number	6AG1232-4HB32-4XB0 SIPLUS S7-1200 SM 1232 2AQ 13Bit	6AG1232-4HD32-2XB0 SIPLUS S7-1200 SM 1232 4AQ 14Bit	6AG1232-4HD32-4XB0 SIPLUS S7-1200 SM 1232 4AQ 14Bit
General information			
Product type designation	SM 1232, AQ 2x14 bit	SM 1232, AQ 4x14 bit	SM 1232, AQ 4x14 bit
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Input current			
Current consumption, typ.	45 mA	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA	80 mA
Analog outputs			
Number of analog outputs	2; Current or voltage	4; Current or voltage	4; Current or voltage
Output ranges, voltage			
• -10 V to +10 V	Yes	Yes	Yes
Output ranges, current			
• 0 to 20 mA	Yes	Yes	Yes
Load impedance (in rated range of output)			
• with voltage outputs, min.	1 000 Ω	1 000 Ω	1 000 Ω
• with current outputs, max.	600 Ω	600 Ω	600 Ω
Cable length			
• shielded, max.	100 m; shielded, twisted pair	100 m; shielded, twisted pair	100 m; shielded, twisted pair
Analog value generation for the outputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit	14 bit; Voltage: 14 bit; Current : 13 bit	14 bit; Voltage: 14 bit; Current : 13 bit
Errors/accuracies			
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range	25 °C ±0.3%, to 55 °C ±0.6% total measurement range	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Common mode voltage, max.	12 V	12 V	12 V
Interrupts/diagnostics/status information			
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes
• short-circuit	Yes	Yes	Yes
Diagnostics indication LED			
• for status of the outputs	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes
Degree and class of protection			
IP degree of protection	IP20	IP20	IP20

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Technical specifications (continued)

Article number	6AG1232-4HB32-4XB0 SIPLUS S7-1200 SM 1232 2AQ 13Bit	6AG1232-4HD32-2XB0 SIPLUS S7-1200 SM 1232 4AQ 14Bit	6AG1232-4HD32-4XB0 SIPLUS S7-1200 SM 1232 4AQ 14Bit
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1232-4HB32-4XB0 SIPLUS S7-1200 SM 1232 2AQ 13Bit	6AG1232-4HD32-2XB0 SIPLUS S7-1200 SM 1232 4AQ 14Bit	6AG1232-4HD32-4XB0 SIPLUS S7-1200 SM 1232 4AQ 14Bit
Connection method			
required front connector	Yes	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• plastic	Yes	Yes	Yes
Dimensions			
Width	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	180 g	180 g	180 g

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Overview



- Analog output for SIPLUS S7-1200
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

	Article No.
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to environmental substances)	
Range of ambient temperature -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Range of ambient temperature 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**
Accessories	See SIMATIC S7-1200 SB 1232 analog output modules

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Technical specifications

Article number	6AG1232-4HA30-4XB0 SIPLUS S7-1200 SB 1232 1AQ	6AG1232-4HA30-5XB0 SIPLUS S7-1200 SB 1232 1AQ
General information		
Product type designation	SB 1232, AQ 1x12 bit	SB 1232, AQ 1x12 bit
Input current		
from backplane bus 5 V DC, typ.	15 mA	15 mA
Output voltage		
Power supply to the transmitters		
• Supply current, max.	25 mA	25 mA
Analog inputs		
Number of analog inputs	0	0
Analog outputs		
Number of analog outputs	1	1
Cycle time (all channels) max.	Voltage: 300 µS (R), 750 µS (1 uF) Current: 600 ms (1 mH); 2 ms (10 mH)	Voltage: 300 µS (R), 750 µS (1 uF) Current: 600 ms (1 mH); 2 ms (10 mH)
Output ranges, voltage		
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 000 Ω	1 000 Ω
• with current outputs, max.	600 Ω	600 Ω
Cable length		
• shielded, max.	100 m; shielded, twisted pair	100 m; shielded, twisted pair
Analog value generation for the outputs		
Conversion principle	Differential	Differential
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	12 bit	12 bit
Errors/accuracies		
Temperature error (relative to output range), (+/-)	25 °C ±0.5%, to 55 °C ±1%	25 °C ±0.5 %, up to 55 °C ±1.8 %
Interrupts/diagnostics/status information		
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Diagnostics indication LED		
• for status of the outputs	Yes	Yes

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Technical specifications (continued)

Article number	6AG1232-4HA30-4XB0 SIPLUS S7-1200 SB 1232 1AQ	6AG1232-4HA30-5XB0 SIPLUS S7-1200 SB 1232 1AQ
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weights		
Weight, approx.	40 g	40 g

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Overview



- Analog inputs and outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs and outputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

	Article No.
SIPLUS SM 1234 analog input/output signal module	
(Extended temperature range and exposure to environmental substances)	
Range of ambient temperature -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12-bit + sign; 2 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit	**6AG1234-4HE32-2XB0**
Range of ambient temperature 0 ... +55 °C	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12-bit + sign; 2 analog outputs, ±10 V with 14-bit or 0 ... 20 mA with 13-bit	**6AG1234-4HE32-4XB0**
Accessories	See SIMATIC S7-1200 SM 1234 analog input/output modules

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Technical specifications

Article number	6AG1234-4HE32-2XB0 SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit	6AG1234-4HE32-4XB0 SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
General information		
Product type designation	SM 1234, AI 4x13 bit/AQ 2x14 bit	SM 1234, AI 4x13 bit/AQ 2x14 bit
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
Current consumption, typ.	60 mA	60 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog inputs		
Number of analog inputs	4; Current or voltage differential inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V	35 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA
Cycle time (all channels) max.	625 µs	625 µs
Input ranges		
• Voltage	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA
Input ranges (rated values), voltages		
• -10 V to +10 V	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes
• -5 V to +5 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
Analog outputs		
Number of analog outputs	2; Current or voltage	2; Current or voltage
Output ranges, voltage		
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 000 Ω	1 000 Ω
• with current outputs, max.	600 Ω	600 Ω
Cable length		
• shielded, max.	100 m; shielded, twisted pair	100 m; shielded, twisted pair
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	12 bit; + sign	12 bit; + sign
• Integration time, parameterizable	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values		
• Parameterizable	Yes	Yes
Analog value generation for the outputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit	14 bit; Voltage: 14 bit; Current : 13 bit

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Technical specifications (continued)

Article number	6AG1234-4HE32-2XB0 SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit	6AG1234-4HE32-4XB0 SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
Errors/accuracies		
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -40 °C to 70 °C ±0.28 % of the full-scale deflection	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -40 °C to 70 °C ±0.85 % of the full-scale deflection	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.1 %	0.1 %
• Current, relative to input range, (+/-)	0.1 %	0.1 %
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Common mode voltage, max.	12 V	12 V
Interrupts/diagnostics/status information		
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
• short-circuit	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for status of the outputs	Yes	Yes
• for maintenance	Yes	Yes
Potential separation		
Potential separation analog outputs		
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP20	IP20

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Technical specifications (continued)

Article number	6AG1234-4HE32-2XB0 SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit	6AG1234-4HE32-4XB0 SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously used outputs 1, inputs 2 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	220 g	220 g

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Overview

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Selection and ordering data

SIPLUS SM 1231 thermocouple module	
(Extended temperature range and exposure to environmental substances)	
Range of ambient temperature -40 ... +70 °C	
8 inputs +/- 80 mV, resolution 15-bit + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	**6AG1231-5QF32-4XB0**
4 inputs +/- 80 mV, resolution 15-bit + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	**6AG1231-5QD32-4XB0**
Accessories	See SIMATIC S7-1200 SM 1231 thermocouple module

Technical specifications

Article number	6AG1231-5QF32-4XB0	6AG1231-5QD32-4XB0
	SIPLUS S7-1200 SM 1231 8AI TC 16Bit	SIPLUS S7-1200 SM 1231 4AI TC 16Bit
General information		
Product type designation	SM 1231, AI 8x16 bit TC	SM 1231, AI 4x16 bit TC
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog inputs		
Number of analog inputs	4; Thermocouples	4; Thermocouples
permissible input voltage for voltage input (destruction limit), max.	±35 V	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
Input ranges		
• Voltage	No	No
• Current	No	No
• Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: ±80 mV
• Resistance thermometer	No	No
• Resistance	No	No
Input ranges (rated values), voltages		
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), thermocouples		
• type B	Yes	Yes
• type C	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
• Type T	Yes	Yes
• Type TXK/TXK(L) to GOST	Yes	Yes
Thermocouple (TC)		
- Temperature compensation		
- Parameterizable	No	No
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
Smoothing of measured values		
• Parameterizable	Yes	Yes

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Technical specifications (continued)

Article number	6AG1231-5QF32-4XB0 SIPLUS S7-1200 SM 1231 8AI TC 16Bit	6AG1231-5QD32-4XB0 SIPLUS S7-1200 SM 1231 4AI TC 16Bit
Errors/accuracies		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %	0.5 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Common mode interference, min.	120 dB	120 dB
Interrupts/diagnostics/status information		
Alarms	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1231-5QF32-4XB0 SIPLUS S7-1200 SM 1231 8AI TC 16Bit	6AG1231-5QD32-4XB0 SIPLUS S7-1200 SM 1231 4AI TC 16Bit
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	220 g	180 g

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Overview

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature detectors can be used
- Can easily be retrofitted to existing plant

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Selection and ordering data

SIPLUS SM 1231 RTD signal module	
(Extended temperature range and exposure to environmental substances)	
4 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 Ohm, resolution 15-bit + sign	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1231-5PD32-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1231-5PD32-2XB0**
8 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 Ohm, resolution 15-bit + sign	
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1231-5PF32-4XB0**
• For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -40 ... +70 °C	**6AG1231-5PF32-2XB0**
Accessories	See SIMATIC S7-1200 SM 1231 RTD signal module

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Technical specifications

Article number	6AG1231-5PD32-4XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6AG1231-5PD32-2XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6AG1231-5PF32-4XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	6AG1231-5PF32-2XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
General information				
Product type designation	SM 1231, AI 4x16 bit RTD	SM 1231, AI 4x16 bit RTD	SM 1231, AI 8x16 bit RTD	SM 1231, AI 8x16 bit RTD
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Input current				
Current consumption, typ.	40 mA	40 mA	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA	80 mA	80 mA
Analog inputs				
Number of analog inputs	4; Resistance thermometer	4; Resistance thermometer	8; Resistance thermometer	8; Resistance thermometer
permissible input voltage for voltage input (destruction limit), max.	±35 V	±35 V	±35 V	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
Input ranges				
• Voltage	No	No	No	No
• Current	No	No	No	No
• Thermocouple	No	No	No	No
• Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω	Yes; 150 Ω, 300 Ω, 600 Ω	Yes; 150 Ω, 300 Ω, 600 Ω	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), resistance thermometer				
• Cu 10	Yes	Yes	Yes	Yes
• Ni 100	Yes	Yes	Yes	Yes
• Ni 1000	Yes	Yes	Yes	Yes
• LG-Ni 1000	Yes	Yes	Yes	Yes
• Ni 120	Yes	Yes	Yes	Yes
• Ni 200	Yes	Yes	Yes	Yes
• Ni 500	Yes	Yes	Yes	Yes
• Pt 100	Yes	Yes	Yes	Yes
• Pt 1000	Yes	Yes	Yes	Yes
• Pt 200	Yes	Yes	Yes	Yes
• Pt 500	Yes	Yes	Yes	Yes
Input ranges (rated values), resistors				
• 0 to 150 ohms	Yes	Yes	Yes	Yes
• 0 to 300 ohms	Yes	Yes	Yes	Yes
• 0 to 600 ohms	Yes	Yes	Yes	Yes
Thermocouple (TC)				
- Temperature compensation				
- Parameterizable	No	No	No	No
Analog value generation for the inputs				
Integration and conversion time/resolution per channel				
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz

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Technical specifications (continued)

Article number	6AG1231-5PD32-4XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6AG1231-5PD32-2XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6AG1231-5PF32-4XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	6AG1231-5PF32-2XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
Errors/accuracies				
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1% / ±0.3% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1% / ±0.3% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %	0.05 %	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency				
• Common mode interference, min.	120 dB	120 dB	120 dB	120 dB
Interrupts/diagnostics/status information				
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out	Yes; Can be read out	Yes; Can be read out
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• for status of the inputs	Yes	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes	Yes
Degree and class of protection				
IP degree of protection	IP20	IP20	IP20	IP20

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Technical specifications (continued)

Article number	6AG1231-5PD32-4XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6AG1231-5PD32-2XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6AG1231-5PF32-4XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	6AG1231-5PF32-2XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method				
required front connector	Yes	Yes	Yes	Yes
Mechanics/material				
Enclosure material (front)				
• plastic	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1231-5PD32-4XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6AG1231-5PD32-2XB0 SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	6AG1231-5PF32-4XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	6AG1231-5PF32-2XB0 SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
Dimensions				
Width	45 mm	45 mm	70 mm	70 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
Weights				
Weight, approx.	220 g	220 g	220 g	220 g

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Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance-type temperature detectors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Selection and ordering data

SIPLUS SB 1231 RTD signal board (Extended temperature range and exposure to environmental substances) 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15-bit + sign	**6AG1231-5PA30-5XB0**
Accessories	See SIMATIC S7-1200 SB 1231 RTD signal board

Technical specifications

Article number	6AG1231-5PA30-5XB0 SIPLUS S7-1200 SB 1231 1AI RTD
General information	
Product type designation	SB 1231, AI 1x16 bit RTD
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
Analog inputs	
Number of analog inputs	1; Resistance thermometer
permissible input voltage for current input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	Yes
• Current	No
• Thermocouple	No
• Resistance thermometer	Yes; Platinum (Pt)
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), resistance thermometer	
• Pt 100	Yes
• Pt 1000	Yes
• Pt 200	Yes
• Pt 500	Yes
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
Thermocouple (TC)	
- Temperature compensation	
- Parameterizable	No
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz

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Technical specifications (continued)

Article number	6AG1231-5PA30-5XB0 SIPLUS S7-1200 SB 1231 1AI RTD
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, up to 55 °C ±0.25% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• plastic	Yes

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Technical specifications (continued)

Article number	6AG1231-5PA30-5XB0 SIPLUS S7-1200 SB 1231 1AI RTD
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

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Overview



- Module for connecting up to 4 IO-Link devices according to IO-Link Specification V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), Version V3.2 and higher.

Selection and ordering data

SIMATIC S7-1200, SM1278 IO-Link 4xIO-Link Master	**6ES7278-4BD32-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 8CH/16CH (4 units with 7 screws each)	**6ES7292-1AG30-0XA0**
SIMATIC S7-1200, spare part, tin-coated I/O terminal block In push-in technology, for digital signal modules 8CH/16CH (4 units with 7 pins each)	**6ES7292-2AG30-0XA0**

Technical specifications

Article number	6ES7278-4BD32-0XB0 S7-1200, SM1278, 4 X IO-Link Master
General information	
Product type designation	SM 1278 4xIO-Link master
Supply voltage	
Rated value (DC)	24 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	45 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	150 g

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Overview



- Module for connecting up to 4 IO-Link devices according to IO-Link Specification V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), Version V3.2 and higher.

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SM 1278 4xIO-Link Master signal module	
(Extended temperature range and exposure to environmental substances)	
• For areas with exceptional exposure to environmental substances (conformal coating)	**6AG1278-4BD32-4XB0**
• -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%	**6AG1278-4BD32-2XB0**

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Technical specifications

Article number	6AG1278-4BD32-2XB0 SIPLUS S7-1200 SM 1278 IO-Link Master	6AG1278-4BD32-4XB0 SIPLUS S7-1200 SM 1278 IO-Link Master
General information		
Product type designation	SM 1278 4xIO-Link master	SM 1278 4xIO-Link master
Supply voltage		
Rated value (DC)	24 V	24 V
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• plastic	Yes	Yes

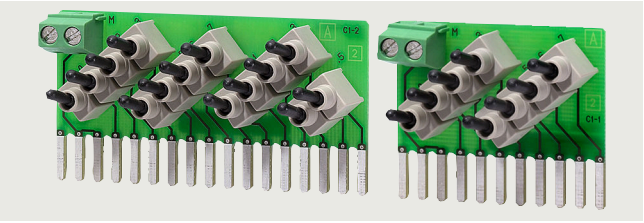
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Technical specifications (continued)

Article number	6AG1278-4BD32-2XB0 SIPLUS S7-1200 SM 1278 IO-Link Master	6AG1278-4BD32-4XB0 SIPLUS S7-1200 SM 1278 IO-Link Master
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	150 g	150 g

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Overview



- Simulator module for program testing during commissioning and ongoing operation
- Simulation of 8 or 14 inputs

Selection and ordering data

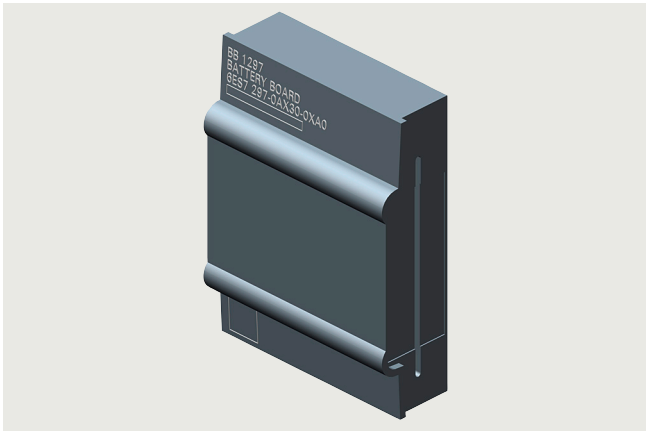
Digital input simulator SIM 1274 simulator module	
SIMATIC S7-1200, SIM 1274 simulator module, for CPU 1211/1212 8 input switches 24 V DC	**6ES7274-1XF30-0XA0**
SIMATIC S7-1200, SIM 1274 simulator module, for CPU 1214/1215 14 input switches 24 V DC	**6ES7274-1XH30-0XA0**
SIMATIC S7-1200, SIM 1274 simulator module for CPU 1217C 14 input switches, 10x 24 V DC inputs, 4x 1.5 V differential inputs	**6ES7274-1XK30-0XA0**
Analog input simulator SIM 1274 simulator module	
SIMATIC S7-1200, SIM 1274 simulator 2 potentiometer inputs	**6ES7274-1XA30-0XA0**

Technical specifications

Article number	6ES7274-1XF30-0XA0	6ES7274-1XH30-0XA0	6ES7274-1XK30-0XA0	6ES7274-1XA30-0XA0
	S7-1200 Simulator Module SIM1274, 8 Inp	S7-1200 Simulator Module SIM1274, 14 Inp	S7-1200 Simulator S7-1217, 14 inputs	S7-1200 Potentiometer Module,2 Pot Input
General information				
Product type designation	SIM 1274, 8DI	SIM 1274, 14 DI	SIM 1274, 14 DI	SIM 1274, 2 AI
Supply voltage				
Rated value (DC)	24 V	24 V		
Digital inputs				
Number of digital inputs	8	14	14	0
Digital outputs				
Number of digital outputs	0	0	0	0
Degree and class of protection				
IP degree of protection	IP20	IP20		
Dimensions				
Width	43 mm	67 mm	93 mm	20 mm
Height	35 mm	35 mm	40 mm	33 mm
Depth	23 mm	23 mm	23 mm	14 mm

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Overview



- Battery board for extending the power reserve for the S7-1200 real-time clock

Selection and ordering data

SIMATIC S7-1200, BB 1297 battery board For long-term buffering of the real-time clock, pluggable in the signal board slot of the S7-12XX (from FW3.0); battery (CR1025) not included in scope of supply	**6ES7297-0AX30-0XA0**

Technical specifications

Article number	6ES7297-0AX30-0XA0 Battery Board BB 1297 f. CPU 12xx
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• for maintenance	Yes; The maintenance LED (MAINT) of the PLC signals that the battery needs to be replaced.
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g

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Overview



SIWAREX WP231 is a versatile, legal for trade weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated without a SIMATIC CPU.

Selection and ordering data

	Article No.
SIWAREX WP231 weighing electronics Single-channel, legal-for-trade, for NAWI non-automatic weighing instruments (e.g. platform scales or hopper scales) with analog load cells (1–4 mV/V), 1 x LC, 4 × DQ, 4 × DI, 1 × AQ, 1 RS 485, Ethernet port	**7MH4960-2AA01**
SIWAREX S7-1200 Equipment Manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWAREX WP231 "Ready-for-use" Complete software package for non-automatic weighing instrument (for S7-1200 and a directly connected operator panel) Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWAREX WP231 "Ready-for-use - legal-for-trade" Software package for non-automatic weighing instruments for S7-1200 requiring official calibration Free download on the Internet at: http://www.siemens.com/weighing/documentation	
Software SecureDisplay Software for a legal trade display on Windows CE-based Panel. SIMATIC Basic and Key Panels are excluded Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Calibration set for SIWAREX WP2xx Valid for SIWAREX WP231 and SIWAREX WP251. For verification of up to 3 scales, comprising: • 3 × inscription foils for ID label • 1 × protective film • 3 × calibration protection plates • Guidelines for verification, certificates and approvals, editable label, SIWAREX WP	**7MH4960-0AY10**
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP231 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	**6XV1850-2GH20**
Accessories	
SIWAREX EB extension box For extending sensor cables	**7MH4710-2AA**
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	**7MH5001-0AA01**
SIWAREX DB digital terminal box For enhanced diagnostic and monitoring options in conjunction with SIWAREX WP electronics	**7MH5001-0AD20**

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Selection and ordering data (continued)

	Article No.
SIWAREX IS Ex interface	
For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately.	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**
• Short-circuit current < 137 mA DC	**7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY	
For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• Sheath color (for hazardous atmospheres): blue	**7MH4702-8AF**
Ground terminal for connecting the load cell cable shield to the grounded DIN rail	**6ES5728-8MA11**
Remote display (optional)	
The digital remote displays can be connected directly to the SIWAREX WP231 via the RS 485 interface. Suitable remote display: S102 **Siebert Industrieelektronik GmbH PO Box 1180 D-66565 Eppelborn Tel.: +49 6806/980-0 Fax: +49 6806/980-999** http://www.siebert-group.com/en Detailed information is available from the manufacturer.	

Technical specifications

SIWAREX WP231	
Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Communication interfaces	• SIMATIC S7-1200 backplane bus • RS 485 (Modbus RTU, Siebert remote display) • Ethernet (SIWATOOL V7, Modbus TCP/IP) • Analog output 0/4 ... 20 mA • 4 × digital outputs 24 V DC, floating, short-circuit proof • 4 × digital inputs 24 V DC, floating
Commissioning options	• Using SIWATOOL V7 • Using function block in SIMATIC S7-1200 CPU / Touch Panel • Using Modbus TCP/IP • Using Modbus RTU
Measuring accuracy	
EC type approval as non-automatic weighing instrument, trade class III	3000 d ≥ 0.5 µV/e
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Measuring frequency	100 / 120 Hz
Digital filter	Variable adjustable low-pass and average filter
Typical applications	• Non-automatic weighing instruments • Force measurements • Fill-level monitoring • Belt tension monitors
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 × min/max • Empty
Zeroing	Per command
Tare	Per command
Tare specification	Per command
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 ... 4 mV/V
Permissible range of the measurement signal (with 4 mV/V sensors)	-21.3 ... +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals/certificates	• ATEX Zone 2 • UL • EAC • KCC • RCM • OIML R76 • Type approval 2009/23/EC (NAWI)
Calibration approval	EC type approval OIML R76
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
IP degree of protection to EN 60529; IEC 60529	IP20

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Technical specifications (continued)

SIWAREX WP231	
Climatic requirements $T_{min\ (IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
• Horizontal installation	-10 ... +55 °C (14 ... 131 °F)
EMC requirements	According to EN 45501
Dimensions	70 × 75 × 100 mm (2.76 × 2.95 × 3.94 inch)

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Overview



SIWAREX WP241 is a flexible weighing module for belt scales. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated as a stand-alone module, i.e. without a SIMATIC CPU.

Selection and ordering data

	Article No.
SIWAREX WP241 weighing electronics Single-channel, for belt scales with analog load cells / full-bridge strain gauges (1 - 4 mV/V), 1 × LC, 4 × DQ, 4 × DI, 1 × AQ, 1 × RS 485, Ethernet port	**7MH4960-4AA01**
SIWAREX S7-1200 Equipment Manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWAREX WP241 "Ready-for-use" Complete software package for belt scale (for S7-1200 and a directly connected operator panel) Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP241 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	**6XV1850-2GH20**
Accessories	
SIWAREX EB extension box For extending sensor cables	**7MH4710-2AA**
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	**7MH5001-0AA01**
SIWAREX IS Ex interface For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately.	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**
• Short-circuit current < 137 mA DC	**7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• Sheath color (for hazardous atmospheres): blue	**7MH4702-8AF**
Ground terminal for connecting the load cell cable shield to the grounded DIN rail	**6ES5728-8MA11**

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Technical specifications

SIWAREX WP241	
Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Communication interfaces	• SIMATIC S7-1200 backplane bus • RS 485 (Modbus RTU) • Ethernet (SIWATOOL V7, Modbus TCP/IP) • Analog output 0/4 - 20 mA • 4 × digital outputs, 24 V DC, floating, short-circuit proof • 4 × digital inputs 24 V DC, floating
Commissioning options	• Using SIWATOOL V7 • Using function block in SIMATIC S7-1200 CPU / Touch Panel • Using Modbus TCP/IP • Using Modbus RTU
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Measuring frequency	100 / 120 Hz
Digital filter	Separate, variable adjustable low-pass and average filter for loading and speed
Filter for conveyor load	Low-pass filter (limit frequency 0.05 ... 50 Hz)
Filter for belt speed	Low-pass filter (limit frequency 0.05 ... 50 Hz)
Weighing functions	
Readout data	• Weight • Belt load • Material flow rate • Accumulated total • Main total • Free totals 1 ... 4 • Belt speed
Limits (min/max)	• Belt load • Material flow rate • Belt speed
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 ... 4 mV/V
Permissible measurement signal range	-21.3 ... +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals/certificates	• ATEX Zone 2 • UL • EAC • KCC • RCM
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements $T_{min\ (IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
• Horizontal installation	-10 ... +55 °C (14 ... 131 °F)
EMC requirements	According to EN 45501

Technical specifications (continued)

SIWAREX WP241	
Dimensions	70 × 75 × 100 mm (2.76 × 2.95 × 3.94 inch)

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Overview



SIWAREX WP251 is a flexible weighing module for dosing and filling processes. The compact module can be installed seamlessly in the SIMATIC S7-1200 automation system. It can also be used without a SIMATIC CPU in stand-alone mode.

Selection and ordering data

	Article No.
SIWAREX WP251 weighing electronics Single-channel, legal-for-trade, for automatic dosing and filling scales (AGFI, ACI, NAWI) with analog load cells / full-bridge strain gauges (1 - 4 mV/V), 1 × LC, 4 × DQ, 4 × DI, 1 × AQ, 1 × RS 485, Ethernet port	**7MH4960-6AA01**
SIWAREX WP251 Equipment Manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWAREX WP251 "Ready-for-use" Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Calibration set for SIWAREX WP2xx Valid for SIWAREX WP231 and SIWAREX WP251. For verification of up to 3 scales, comprising: • 3 × inscription foils for ID label • 1 × protective film • 3 × calibration protection plates • Guidelines for verification, certificates and approvals, editable label, SIWAREX WP	**7MH4960-0AY10**
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP251 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	**6XV1850-2GH20**
Accessories	
SIWAREX EB extension box For extending sensor cables	**7MH4710-2AA**
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	**7MH5001-0AA01**
SIWAREX IS Ex interface For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**
• Short-circuit current < 137 mA DC	**7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• Sheath color (for hazardous atmospheres): blue	**7MH4702-8AF**

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Selection and ordering data (continued)

	Article No.
Ground terminal for connecting the load cell cable shield to the grounded DIN rail	**6ES5728-8MA11**
Remote display (optional) The digital remote displays can be connected directly to the SIWAREX WP251 via the RS 485 interface Suitable remote display: S102 **Siebert Industrieelektronik GmbH** **PO Box 1180** **D-66565 Eppelborn** **Tel.: +49 6806/980-0** **Fax: +49 6806/980-999** Internet: http://www.siebert-group.com/en Detailed information is available from the manufacturer.	

Technical specifications

SIWAREX WP251	
Weighing modes	• Non automatic weighing instrument (NAWI) (filling + removal) (legal-for-trade in accordance with OIML R76) • Catchweighing instrument (CWI) (filling + removal) (legal-for-trade in accordance with OIML R51) • Gravimetric filling instrument (GFI) (legal-for-trade in accordance with OIML R61) • Discontinuous totalizing automatic weighing instrument (DTI) - (legal-for-trade in accordance with OIML R107)
Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Ports	• 1 × SIMATIC S7-1200 system bus • 1 × Ethernet (SIWATOOL and Modbus TCP/IP) • 1 x RS 485 (Modbus RTU or remote display) • 1 x analog output (0/4 - 20 mA) • 4 × digital inputs (24 V DC, floating) • 4 × digital outputs (24 V DC, floating, short-circuit proof)
Functions	• 3 limits • Tare • Tare specification • Zeroing • Zero adjustment • Statistics • Automatic correction of the shut-off points • Internal protocol memory for 550 000 entries • Trace function for signal analysis • Internal restore point • Stand-alone mode or SIMATIC S7-1200 integrated
Parameter assignment	• Full access using function block in SIMATIC S7-1200 • Full access using Modbus TCP/IP • Full access using Modbus RTU
Remote display	
Connection	Via RS 485
Scale adjustment	PC software SIWATOOL (Ethernet), S7-1200 function block and touch panel or directly connected operator panel (Modbus)
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Number of measurements/second	100 or 120 (selectable)
Filter	• Low-pass filter 0.1 ... 50 Hz • Average value filter
Load cells	Strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 ... 4 mV/V
Permissible range of the measurement signal (with 4 mV/V sensors)	-21.3 ... +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Certificates	• ATEX Zone 2 • UL • KCC • EAC • RCM

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Technical specifications (continued)

SIWAREX WP251	
Calibration approvals	• EU type-examination certificate 2014/31/EU (NAWI) according to OIML R76 • EU type-examination certificate 2014/32/EU (MID) according to OIML R61 and OIML R51 • EU type-examination certificates 2014/32/EU (MID) according to OIML R107
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements $T_{min\ (IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
• Horizontal installation	-10 ... +55 °C (14 ... 131 °F)
EMC requirements	According to EN 45501
Dimensions	70 × 75 × 100 mm (2.76 × 2.95 × 3.94 inch)

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Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU, 3964(R)
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic

Selection and ordering data

CM 1241 communications module	
SIMATIC S7-1200, CM 1241 communications module, RS422/485 9-pin D-sub (socket) supports Freeport	**6ES7241-1CH32-0XB0**
SIMATIC S7-1200, CM 1241 communications module, RS-232 9-pin D-sub (pin), supports Freeport	**6ES7241-1AH32-0XB0**
Accessories	
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps communication modules (Communications module front flap bottom & top) 4 units each	**6ES7291-1CC30-0XA0**

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Technical specifications

Article number	6ES7241-1CH32-0XB0 Communication Module cm 1241, RS422/485	6ES7241-1AH32-0XB0 Communication Module cm 1241, RS232
General information		
Product type designation	CM 1241 RS 422 / 485	CM 1241 RS 232
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
Current consumption, max.	220 mA; From backplane bus 5 V DC	200 mA; From backplane bus 5 V DC
Interfaces		
Interfaces/bus type	RS 422 / 485 (X.27)	RS 232C (V.24)
Number of interfaces	1	1
Point-to-point connection		
• Cable length, max.	1 000 m	10 m
- Integrated protocol driver		
- Freeport	Yes	Yes
- ASCII	Yes; Available as library function	Yes; Available as library function
- Modbus RTU master	Yes	Yes
- Modbus RTU device	Yes	Yes
- USS	Yes; Available as library function	
Protocols		
Integrated protocols		
- Freeport		
- Telegram length, max.	1 kbyte	1 kbyte
- Bits per character	7 or 8	7 or 8
- Number of stop bits	1 (Standard), 2	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
- 3964 (R)		
- Telegram length, max.	1 kbyte	1 kbyte
- Bits per character	7 or 8	7 or 8
- Number of stop bits	1 (Standard), 2	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
- Modbus RTU master		
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
- max. number of devices	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
- Modbus RTU device		
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Diagnostics indication LED		
• for status of the outputs	Yes	Yes
Degree and class of protection		
IP degree of protection	IP20	IP20

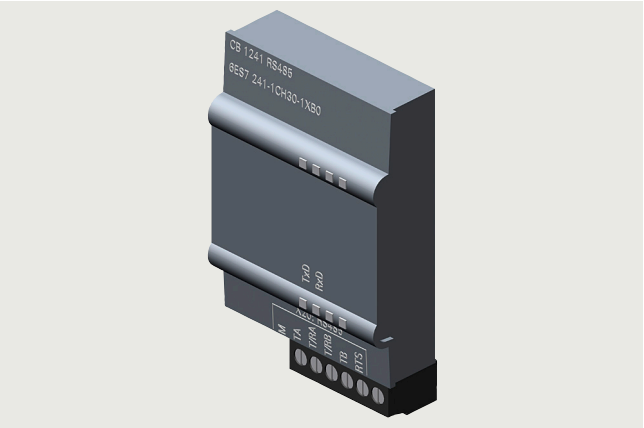
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Technical specifications (continued)

Article number	6ES7241-1CH32-0XB0 Communication Module cm 1241, RS422/485	6ES7241-1AH32-0XB0 Communication Module cm 1241, RS232
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Dimensions		
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	155 g	150 g

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Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200, CB 1241 communication board RS-485, terminal block, supports Freeport	**6ES7241-1CH30-1XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block For signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7241-1CH30-1XB0 Communication Board CB 1241, RS485
General information	
Product type designation	CB 1241 RS 485
Input current	
from backplane bus 5 V DC, typ.	50 mA
Interfaces	
Point-to-point connection	
• Cable length, max.	1 000 m
- Integrated protocol driver	
- Freeport	Yes
- ASCII	Yes; Available as library function
- Modbus RTU master	Yes
- Modbus RTU device	Yes
- USS	Yes; Available as library function
Protocols	
Integrated protocols	
- Freeport	
- Telegram length, max.	1 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
- 3964 (R)	
- Telegram length, max.	1 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
- Modbus RTU master	
- Address area	1 through 49 999 (Standard Modbus addressing)
- max. number of devices	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
- Modbus RTU device	
- Address area	1 through 49 999 (Standard Modbus addressing)
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Mechanics/material	
Enclosure material (front)	
• plastic	Yes

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Technical specifications (continued)

Article number	6ES7241-1CH30-1XB0 Communication Board CB 1241, RS485
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g

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Overview



DP-M	DP-S	FMS	PG/OP	S7
	●			

G_IK10_XX_10322

The CM 1242-5 communications module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the SIMATIC S7-1200 for optimal production.

Selection and ordering data

	Article No.
CM 1242-5 communications module	
Communications module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DP slave module	**6GK7242-5DX30-0XE0**

Accessories

	Article No.
PROFIBUS FastConnect RS485 connection plug	
With 90° cable outlet; with insulation displacement terminals, max. transfer rate 12 Mbps	
• Without programming device interface	**6ES7972-0BA52-0XA0**
• With programming device interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC standard cable	
2-core bus cable, shielded, special design for fast installation, sold by the meter; delivery unit: max. 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS stations up to 12 Mbps with connecting cable	**6GK1500-0AA10**

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Technical specifications

Article number product type designation	6GK7242-5DX30-0XE0 CM 1242-5
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7242-5DX30-0XE0
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
• for power supply	0
type of electrical connection	
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS485)
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
power loss [W]	0.75 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	0 ... 45 °C
• for horizontally arranged busbars during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1200 single width
width	30 mm
height	100 mm
depth	75 mm
net weight	0.115 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	3

Technical specifications (continued)

Article number product type designation	6GK7242-5DX30-0XE0 CM 1242-5
performance data PROFIBUS DP	
service as DP device	
• DPV0	Yes
• DPV1	Yes
data volume	
• of the address range of the inputs as DP device total	240 byte
• of the address range of the outputs as DP device total	240 byte
performance data telecontrol	
protocol is supported	
• TCP/IP	No
product functions management, configuration, engineering	
configuration software	
• required	STEP 7 Basic/Professional
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability KC approval	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes
standards, specifications, approvals marine classification header	
Marine classification association American Bureau of Shipping Europe Ltd. (ABS)	Yes
Marine classification association French marine classification society (BV)	Yes
Marine classification association Det Norske Veritas (DNV)	Yes
Marine classification association Lloyds Register of Shipping (LRS)	Yes
Marine classification association Nippon Kaiji Kyokai (NK)	Yes
Marine classification association Royal Institution of Naval Architects (RINA)	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	89.58 kg
• during manufacturing	14.29 kg
• during operation	75.11 kg
• after end of life	0.18 kg

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Technical specifications (continued)

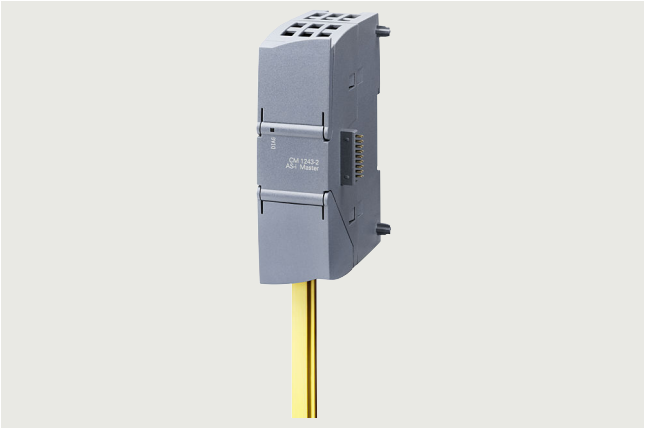
Article number product type designation	6GK7242-5DX30-0XE0 CM 1242-5
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview

The CM 1243-2 communications module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission
- Supports all AS-Interface master functions in accordance with the AS-Interface specification V3.0
- Indication of the operating state on the front of the device displayed via LED
- Display of operating mode, AS-Interface voltage faults, configuration faults and peripheral faults via LED behind the front panel
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-Interface with 30 V voltage and for AS-i Power24V: A standard 24 V power supply unit can be used in combination with the optional DCM 1271 data decoupling module.
- Configuration and diagnostics via the TIA Portal
- Improved performance with current firmware version V1.2



CM 1243-2 communications module for S7-1200

More information

Equipment Manual for AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module, **see** https://support.industry.siemens.com/cs/ww/en/view/57358958

Design

The CM 1243-2 communications module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It has:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in scope of supply) can be removed to facilitate installation.

Function

The CM 1243-2 supports all specified functions of the AS-Interface specification V3.0.

The values of the digital AS-i slaves can be activated via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be accessed directly in the process image.

If required, master calls can be performed with the data record interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

The optional DCM 1271 data decoupling module (see "Accessories") has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A. For more information on DCM 1271, see DCM 1271 data decoupling module.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see www.siemens.com/cybersecurity-industry.

Configuration

The TIA Portal enables user-friendly configuration and diagnostics of the AS-Interface master and any connected device modules.

When operated on a S7-1200 CPU with firmware version V4.0 or higher, the firmware version V1.1 (or higher) is required for the CM 1243-2.

Benefits

- More flexibility and versatility in the use of SIMATIC S7-1200 as the result of a significant increase in the number of digital and analog inputs/outputs available
- Very easy configuration and diagnostics of the AS-Interface via the TIA Portal
- Simple operation with AS-Interface power supply unit (see AS-Interface power supply units) possible without restrictions.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. For decoupling, the AS-i DCM 1271 data decoupling module is required, see "Accessories" and DCM 1271 data decoupling module.
- LEDs for indication of fault statuses for fast diagnostics
- Monitoring of AS-Interface voltage facilitates diagnostics

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Application

The CM 1243-2 is the AS-Interface master connection for the SIMATIC S7-1200. Through connection to AS-Interface, the number of digital inputs and outputs available for the S7-1200 is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM).

The integrated analog value processing also makes the analog values available at the AS-Interface for the S7-1200. Up to 31 analog slaves with a standard address (each with up to four channels) or up to 62 analog slaves with an A/B address (each with up to two channels) are possible per CM.

Operating conditions

- The CM 1243-2 communications module exchanges data with the S7-1200 CPU with a cycle time of 10 ms.
- The AS-i cycle time depends on the AS-i bus capacity and is up to 5 ms in the case of 31 slave addresses; for more information, see Equipment Manual "AS-i Master CM 1243-2 and AS-i Data Decoupling Unit DCM 1271".
- For calculation of the maximum switching frequency at inputs/outputs of AS-i slaves, these cycle times and the runtime of the user program must be added up.

Selection and ordering data

Version	Article No.
CM 1243-2 communications module • AS-Interface master for SIMATIC S7-1200 • Corresponds to AS-Interface specification V3.0 • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W x H x D) mm: 30 x 100 x 75 Note: The CM 1243-2 communications module is available as a SIPLUS version under Article No. 6AG1243-2AA30-7XB0 in the extended temperature range (from -25 to +70 °C) and for use in harsh environmental conditions (coated according to environment standard IEC 60721). For more information, see www.siemens.com/siplus-extreme.	**3RK7243-2AA30-0XB0**
Accessories	
DCM 1271 data decoupling module • Max. current: 1 x 4 A • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W x H x D) mm: 30 x 100 x 75	**3RK7271-1AA30-0AA0**
Screw terminals (spare part)	
• With screw terminals, 5-pole For AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module	**3RK1901-3MA00**
• With screw terminals, 3-pole For AS-i DCM 1271 data decoupling module for connecting the power supply unit	**3RK1901-3MB00**
AS-Interface addressing unit V3.0 • For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i specification V3.0 • For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with four type AA batteries (IEC LR6, NEDA 15) • Degree of protection IP40 • Dimensions (W x H x D) mm: 84 x 195 x 35 • Scope of supply: - Addressing unit with four batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m	**3RK1904-2AB02**

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Overview

With the aid of the DCM 1271 data decoupling module, the AS-Interface network can also be supplied with 24 V DC or 30 V DC from a standard power supply unit and the transmission of data and power can be implemented on one cable.

The DCM 1271 data decoupling module has the same type of enclosure as an S7-1200 module and can therefore be perfectly combined with the AS-i Master CM 1243-2.

The DCM 1271 data decoupling module has no connection to the backplane bus of the SIMATIC S7-1200 and is therefore not counted as a communications module for the calculation of the maximum configuration.



DCM 1271 data decoupling module for SIMATIC S7-1200

More information

Equipment Manual for AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module, see https://support.industry.siemens.com/cs/ww/en/view/57358958

More information on AS-i Power24V, see System Manual for AS-Interface

Features of the DCM 1271 data decoupling module

- Design: S7-1200, width 30 mm, degree of protection IP20
- Detachable terminals (included in the scope of supply)
- Single data decoupling
- Supply of several AS-i networks with a single power supply unit
- Operation with 24 V DC or 30 V DC, grounded or non-grounded
- Current limiting at 4 A
- Integrated ground fault detection
- Diagnostics LEDs for ground faults and overloads
- Signaling contacts for ground fault detection

Ground fault detection

The integrated ground fault detection works with a grounded and non-grounded supply: The connection of negative pole and ground (upstream from the data decoupling module) customary with 24 V DC power supplies is permitted. A ground fault to the negative or positive pole on the AS-Interface network (behind the data decoupling module) is identified and signaled via LED and a transistor output.

Benefits

- An existing standard power supply unit with 24 V DC or 30 V DC can be used for supplying AS-i networks
- The AS-Interface system can also be used in tightly budgeted applications because no AS-Interface power supply unit needs to be purchased
- Applications benefit in addition from the advantages of a modern bus system:
  - High level of standardization
  - Additional diagnostics and maintenance information
  - Faster commissioning

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Application

The AS-Interface data decoupling module is designed for AS-Interface networks with 30 V or 24 V supply (AS-i Power24V).

Operation of an AS-i network with the data decoupling module and a 30 V standard power supply unit is technically equivalent to the use of an AS-Interface power supply unit and offers the service-proven features of AS-Interface for all applications.

AS-i Power24V uses a 24 V power supply unit in conjunction with a data decoupling module and is particularly suitable for compact machines using AS-Interface input/output modules.

Note:

The power supply units must comply with the ES1 (IEC 62368-1) or PELV (Protective Extra Low Voltage)/SELV (Safety Extra Low Voltage) standards, have a residual ripple of < 250 mV_{pp}, and must limit the output voltage to a maximum of 40 V in the event of a fault.

We recommend

- SITOP power supplies, see SITOP power supply or Catalog KT10.1
- PSN130S 30 V power supply units, see 30 V power supply units.

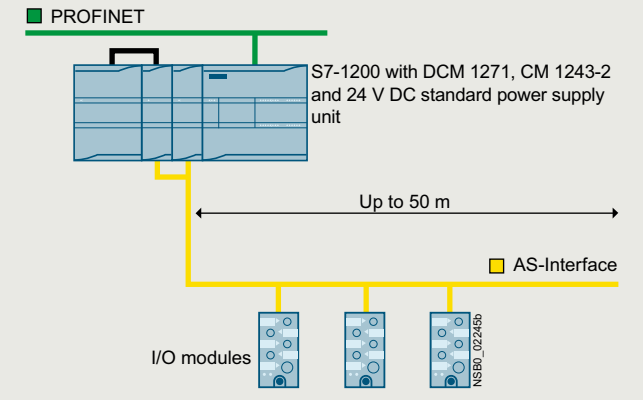
Note on AS-i Power24V:

The length of an AS-i Power24V network is restricted to 50 m in order to limit the voltage drop along the cable.

AS-i masters, AS-i slaves and the sensors and actuators supplied through the AS-i cable must be designed for the reduced voltage. Sensors and actuators for the standard voltage range of 10 to 30 V can be supplied with sufficient voltage.

Please also observe the requirements specified in "AS-i Power24V" for the operation of an AS-i Power24V network, see AS-i Power24V.

More information on AS-i Power24V, see System Manual for AS-Interface, https://support.industry.siemens.com/cs/ww/en/view/26250840.



Configuration of an AS-i Power24V network with AS-Interface DCM 1271 data decoupling module

Selection and ordering data

Ordering data	Article No.
DCM 1271 data decoupling module • Max. current: 1 x 4 A • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W x H x D) mm: 30 x 100 x 75	**3RK7271-1AA30-0AA0**
Accessories	
Screw terminals (spare part)	
• With screw terminals, 5-pole For AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module	**3RK1901-3MA00**
• With screw terminals, 3-pole For AS-i DCM 1271 data decoupling module for connecting the power supply unit	**3RK1901-3MB00**
CM 1243-2 communications module • AS-Interface master for SIMATIC S7-1200 • Corresponds to AS-Interface specification V3.0 • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W x H x D) mm: 30 x 100 x 75	**3RK7243-2AA30-0XB0**

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Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

G_IK10_XX_10323

The CM 1243-5 communications module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DP-V1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows programming devices and operator panels with PROFIBUS interfaces to be connected to the SIMATIC S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industrial enclosure in SIMATIC S7-1200 design for mounting on a standard DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the SIMATIC S7-1200 for optimal production.

Selection and ordering data

	Article No.
CM 1243-5 communications module Communications module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	**6GK7243-5DX30-0XE0**

Accessories

	Article No.
PROFIBUS FastConnect RS485 connection plug With 90° cable outlet; with insulation displacement terminals, max. transfer rate 12 Mbps	
• Without programming device interface	**6ES7972-0BA52-0XA0**
• With programming device interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC standard cable 2-core bus cable, shielded, special design for fast installation, sold by the meter; delivery unit: max. 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M Bus terminal for connection of PROFIBUS stations up to 12 Mbps with connecting cable	**6GK1500-0AA10**

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Technical specifications

Article number	6GK7243-5DX30-0XE0
product type designation	CM 1243-5
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7243-5DX30-0XE0
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
• for power supply	1
type of electrical connection	
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	3-pole terminal block
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	20 %
consumed current	
• from external supply voltage at DC at 24 V typical	0.1 A
power loss [W]	2.4 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	0 ... 45 °C
• for horizontally arranged busbars during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1200 single width
width	30 mm
height	100 mm
depth	75 mm
net weight	0.134 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	3

Technical specifications (continued)

Article number	6GK7243-5DX30-0XE0
product type designation	CM 1243-5
performance data PROFIBUS DP	
service as DP master	
• DPV1	Yes
number of DP devices	
• on DP master operable	32
data volume	
• of the address range of the inputs as DP master total	512 byte
• of the address range of the outputs as DP master total	512 byte
• of the address range of the inputs per DP device	244 byte
• of the address range of the outputs per DP device	244 byte
• of the address range of the diagnostic data per DP device	240 byte
service as DP device	
• DPV0	No
• DPV1	No
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	8; max. 4 connections to other S7 stations
• with PG connections maximum	1
• with PG/OP connections maximum	3
performance data multi-protocol mode	
number of active connections with multi-protocol mode	
• without DP maximum	8
• with DP maximum	8
performance data telecontrol	
protocol is supported	
• TCP/IP	No
product functions management, configuration, engineering	
configuration software	
• required	STEP 7 Basic/Professional
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability KC approval	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes

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Technical specifications (continued)

Article number product type designation	6GK7243-5DX30-0XE0 CM 1243-5
standards, specifications, approvals marine classification header	
Marine classification association American Bureau of Shipping Europe Ltd. (ABS)	Yes
Marine classification association French marine classification society (BV)	Yes
Marine classification association Det Norske Veritas (DNV)	Yes
Marine classification association Lloyds Register of Shipping (LRS)	Yes
Marine classification association Nippon Kaiji Kyokai (NK)	Yes
Marine classification association Royal Institution of Naval Architects (RINA)	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	89.58 kg
• during manufacturing	14.29 kg
• during operation	75.11 kg
• after end of life	0.18 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



- Unmanaged switch for connecting a SIMATIC S7-1200 to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIMATIC S7-1200 for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIMATIC S7-1200 DIN rail
- Low-cost solution for implementing small, local Ethernet networks
- Connection without any problems using RJ45 standard plug connectors
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Selection and ordering data

	Article No.
CSM 1277 compact switch module Unmanaged switch for the connection of a SIMATIC S7-1200 and as many as three other nodes to an Industrial Ethernet operating at 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic equipment manual on CD-ROM	**6GK7277-1AA10-0AA0**
CSM 1277 G2 compact switch module Compact switch module for SIMATIC S7-1200 G2 and up to 3 other nodes in Industrial Ethernet with 10/100 Mbps; Unmanaged switch, 4 RJ45 ports, ext. 24 V DC power supply LED diagnostics, S7-1200 module including equipment manual available for download	**6GK7277-1AA50-0AA0**
SIPLUS NET CSM 1277 compact switch module Unmanaged switch for the connection of a SIPLUS S7-1200 and as many as three other nodes to an Industrial Ethernet operating at 10/100 Mbps 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic equipment manual on CD-ROM	**6AG1277-1AA10-4AA0**

Accessories

	Article No.
IE FC TP trailing cable 2 x 2 (type C) 4-core, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use in cable carriers; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 outlet For connection of Industrial Ethernet FC cables and TP cords; graded prices from 10 and 50 units	**6GK1901-1FC00-0AA0**
IE TP cord RJ45/RJ45	
• TP cord pre-assembled with 2 RJ45 plugs; length: 0.5 m	**6XV1850-2GE50**
• TP cable 4 x 2 with 2 RJ45 plugs; length: 0.5 m	**6XV1870-3QE50**

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Technical specifications

Article number	6GK7277-1AA10-0AA0	6GK7277-1AA50-0AA0
product type designation		
product brand name	SCALANCE	SCALANCE
product type designation	CSM 1277	CSM 1277 G2
Technical Product Detail Page	https://i.siemens.com/1P6GK7277-1AA10-0AA0	https://i.siemens.com/1P6GK7277-1AA50-0AA0
transfer rate		
transfer rate	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
interfaces for communication integrated		
number of electrical connections		
• for network components or terminal equipment	4	4; RJ45
number of 100 Mbit/s SC ports		
• for multimode	0	
interfaces other		
number of electrical connections		
• for power supply	1	1
type of electrical connection		
• for power supply	3-pole terminal block	6-pole terminal block
supply voltage, current consumption, power loss		
type of voltage 1 of the supply voltage	DC	DC
• supply voltage 1 rated value	24 V	24 V
• power loss [W] 1 rated value	1.6 W	1 W
• supply voltage 1 voltage range	19.2 ... 28.8	19.2 ... 28.8
• consumed current 1 maximum	0.07 A	0.34 A
• type of electrical connection 1 for power supply	3-pole terminal block	6-pole terminal block
• product component 1 fusing at power supply input	Yes	Yes
• fuse protection type 1 at input for supply voltage	0,5 A / 60 V	F 0,5 A / 60 V
ambient conditions		
ambient temperature		
• during operation	0 ... 60 °C	-20 ... +60 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
ambient temperature in horizontal mounting position during operation		-20 ... +60 °C
relative humidity		
• at 25 °C without condensation during operation maximum	95 %	95 %
protection class IP	IP20	IP20
design, dimensions and weights		
design	SIMATIC S7-1200 device design	SIMATIC S7-1200 device design
width	45 mm	30 mm
height	100 mm	125 mm
depth	75 mm	100 mm
net weight	0.15 kg	0.166 kg
fastening method		
• 35 mm DIN-rail mounting	Yes	Yes
• wall mounting	Yes	Yes
• S7-300 rail mounting	No	No
• S7-1500 rail mounting	No	No
product features, product functions, product components general		
number of automatically learnable MAC addresses		2 048
number of QoS queues per port		4
product function		
• QoS according to IEEE 802.1Q		Yes

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Technical specifications (continued)

Article number	6GK7277-1AA10-0AA0	6GK7277-1AA50-0AA0
product functions management, configuration, engineering		
product function		
• multiport mirroring	No	No
• CoS		Yes
• switch-managed	No	No
PROFINET conformity class		A
telegram length for Ethernet maximum		1 536 byte
product functions redundancy		
product function		
• Parallel Redundancy Protocol (PRP)/operation in the PRP-network	Yes	Yes
• Parallel Redundancy Protocol (PRP)/Redundant Network Access (RNA)	No	No
standards, specifications, approvals		
certificate of suitability		
• CE marking	Yes	Yes
• UKCA marking	Yes	Yes
• EC Declaration of Conformity EN 61010, IEC 61010-1, UL 61010A-1		Yes
• cULus approval	Yes	Yes
• KC approval	No	Yes
• Regulatory Compliance Mark (RCM)	Yes	Yes
standard		
• for EMC interference emission	EN 61000-6-4 (Class A)	EN 61000-6-4 (Class A)
• for immunity to EMC	EN 61000-6-2	EN 61000-6-2
• for safety from CSA and UL	UL 508, CSA C22.2 No. 142	UL 61010-1, CAN/CSA-C222 No. 61010-1, UL 61010-2-201, CAN/CSA-C22.2 No. 61010-2-201
standards, specifications, approvals hazardous environments		
certificate of suitability		
• ATEX	Yes	
• UKEX	Yes	
• IECEx	Yes	
• CCC for hazardous zone according to GB standard	Yes	
• FM registration	Yes	
standards, specifications, approvals other		
certificate of suitability		
• RoHS conformity	Yes	Yes
standards, specifications, approvals marine classification		
certificate of suitability shipbuilding approval note	Certifications marked 'No' are currently under renewal.	
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	No	
• French marine classification society (BV)	No	
• Chinese Classification Society (CCS)	No	
• Det Norske Veritas (DNV)	No	
• Korean Register of Shipping (KRS)	No	
• Lloyds Register of Shipping (LRS)	No	
• Nippon Kaiji Kyokai (NK)	No	
• Polski Rejestr Statkow (PRS)	No	
• Royal Institution of Naval Architects (RINA)	Yes	

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Technical specifications (continued)

Article number	6GK7277-1AA10-0AA0	6GK7277-1AA50-0AA0
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	65.14 kg	27.29 kg
• during manufacturing	7.42 kg	2.7 kg
• during operation	57.58 kg	24.3 kg
• after end of life	0.14 kg	0.29 kg
product functions general		
MTBF	273 a	268 a
reference temperature for MTBF determination		40 °C
warranty period	5 a	5 a
product function is supported identification link	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com

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Overview



The CP 1243-1 communications processor is used for connecting the SIMATIC S7-1200 to telecontrol centers via remote networks and telecontrol protocols (DNP3, IEC 60870-5-104, TeleControl Basic), and for safe communication via IP-based networks.

The CP has the following features:

- Ethernet-based connection to TeleControl Server Basic, e.g. via internet
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 64 000 values ensures a secure database even with temporary connection failures
- Secure communication via VPN connections based on IPsec
- Access protection via stateful inspection firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7

Selection and ordering data

	Article No.
CP 1243-1 communications processor CP 1243-1 communications processor for connecting SIMATIC S7-1200 as an additional Ethernet interface and for connection to control centers via telecontrol protocols (DNP3, IEC 60870, TeleControl Basic), security (firewall, VPN)	**6GK7243-1BX30-0XE0**

Accessories

	Article No.
CSM 1277 compact switch module Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic Equipment Manual on CD-ROM	**6GK7277-1AA10-0AA0**
IE FC RJ45 plugs RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connection to IE FC RJ45 outlet/IE F RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

Note:
For more information on the Software Update Service, see chapter 11.
You can find ordering data for TeleControl Server Basic software under Telecontrol – Control center – TeleControl Server Basic.

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Technical specifications

Article number	6GK7243-1BX30-0XE0
product type designation	CP 1243-1
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7243-1BX30-0XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
• for power supply	0
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
consumed current	
• from backplane bus at DC at 5 V typical	0.25 A
power loss [W]	1.25 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1200 single width
width	30 mm
height	110 mm
depth	75 mm
net weight	0.122 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• wall mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	3

Technical specifications (continued)

Article number	6GK7243-1BX30-0XE0
product type designation	CP 1243-1
product functions cloud connectivity	
protocol is supported	
• Message Queuing Telemetry Transport (MQTT)	Yes
• Advanced Message Queuing Protocol (AMQP)	No
product function for cloud connectivity	
• trigger management	Yes
• time stamping	Yes
product feature for cloud connectivity buffered message frame memory	No
number of active connections for cloud connectivity	1
number of data points per device maximum	500
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	like CPU
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	like CPU
performance data IT functions	
number of possible connections	
• as email client maximum	1
performance data telecontrol	
suitability for use	
• node station	No
• substation	Yes
• TIM control center	No
control center connection	For use with TeleControl Server Basic, WinCC and PCS7
• by means of a permanent connection	supported
• note	Connection to SCADA system via Telecontrol Server Basic and Standard Telecontrol protocols
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
product function data buffering if connection is aborted	Yes; 64,000 events
number of data points per device maximum	500
number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
performance data teleservice	
diagnostics function online diagnostics with SIMATIC STEP 7	Yes
product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes

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Technical specifications (continued)

Article number	6GK7243-1BX30-0XE0
product type designation	CP 1243-1
product functions management, configuration, engineering	
configuration software	
• required	STEP 7 Basic/Professional
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes
product functions security	
firewall version	stateful inspection
product function with VPN connection	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1, SHA-2
number of possible connections with VPN connection	8
product function	
• password protection for Web applications	No
• password protection for teleservice access	No
• encrypted data transmission	Yes
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	No
product functions time	
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability cULus approval	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes

Technical specifications (continued)

Article number	6GK7243-1BX30-0XE0
product type designation	CP 1243-1
standards, specifications, approvals marine classification header	
Marine classification association Det Norske Veritas (DNV)	Yes
Marine classification association Lloyds Register of Shipping (LRS)	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	89.58 kg
• during manufacturing	14.29 kg
• during operation	75.11 kg
• after end of life	0.18 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



CP 1243-7 LTE is used to connect the S7-1200 to a mobile wireless 4th Generation LTE (Long Term Evolution) network. The increased data transfer rates compared to GPRS and widespread introduction of LTE open up new areas of application. The CP1243-7 is characterized by the following properties:

- 1 connection to LTE (4G) mobile wireless network (various versions for EU and North America)
- Integration into telecontrol applications via IEC60870-5-104, DNP3 or Telecontrol Server Basic
- Data transfer of measured values, control variables or alarms optimized for telecontrol systems
- Operation with fixed IP addresses and dynamic IP addresses with standard cellular phone contract
- Time synchronization based on NTP (Network Time Protocol)
- "On-demand" connection setup via voice call or SMS
- Sending and receiving of SMS
- Teleservice access with STEP 7 to substations via mobile wireless networks
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Temperature range in operation: -20 °C to +70 °C
- DIN rail mounting
- Diagnostics LEDs (overall status and details)
- Integrated security functions (VPN and firewall)
- Access to the CPU web server
- Fast commissioning thanks to easy configuration using STEP 7
- Data buffering of up to 64 000 values ensures a secure database even with temporary connection failures
- Support of SINEMA Remote Connect with autoconfiguration

Selection and ordering data

	Article No.
CP 1243-7 LTE communications processor Communications processor for connecting SIMATIC S7-1200 to TeleControl Server Basic via LTE mobile wireless network	
• **CP 1243-7 LTE EU** Frequencies in European band: 700, 1700 MHz	**6GK7243-7KX30-0XE0**
• **CP 1243-7 LTE US** Frequencies in North American band: 800, 1800, 2600 MHz	**6GK7243-7SX30-0XE0**

Accessories

	Article No.
ANT794-4MR antenna Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional; weatherproof for indoor and outdoor use; 5 m connecting cable with fixed connection to antenna; SMA plug; including mounting bracket, screws, wall plugs	**6NH9860-1AA00**

Note:
You can find ordering data for TeleControl Server Basic software under Telecontrol – Control center – TeleControl Server Basic.

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Technical specifications

Article number product type designation	6GK7243-7KX30-0XE0 CP 1243-7 LTE EU	6GK7243-7SX30-0XE0 CP 1243-7 LTE US
product brand name	SIMATIC NET	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7243-7KX30-0XE0	https://i.siemens.com/1P6GK7243-7SX30-0XE0
transfer rate		
transfer rate		
for LTE transmission		
- with downlink maximum	42 Mbit/s	42 Mbit/s
- with uplink maximum	5.76 Mbit/s	5.76 Mbit/s
interfaces		
number of interfaces according to Industrial Ethernet	0	0
number of electrical connections		
• for external antenna(s)	1	1
• for power supply	1	1
number of slots		
• for SIM cards	1	1
type of electrical connection		
• for external antenna(s)	SMA socket (50 ohms)	SMA socket (50 ohms)
• for power supply	3-pole terminal block	3-pole terminal block
slot version		
• for SIM card	Standard	Standard
wireless technology		
type of mobile wireless service is supported		
• SMS	Yes	Yes
• GPRS	Yes	Yes
•	GPRS (Multislot Class 10)	GPRS (Multislot Class 10)
type of wireless network is supported		
• GSM	Yes	Yes
• UMTS	Yes	Yes
• LTE	Yes	Yes
operating frequency		
• 850 MHz		Yes
• 1900 MHz		Yes
operating frequency for GSM transmission	operating frequency for GSM transmission 900 MHz, operating frequency for GSM transmission 1800 MHz	
operating frequency with UMTS transmission	operating frequency with UMTS transmission 900 MHz, operating frequency with UMTS transmission 2100 MHz	
operating frequency for LTE transmission	operating frequency for LTE transmission 800 MHz, operating frequency for LTE transmission 1800 MHz, operating frequency for LTE transmission 2600 MHz	operating frequency for LTE transmission 700 MHz, operating frequency for LTE transmission 1700 MHz
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	DC
supply voltage external	24 V	24 V
supply voltage external at DC rated value	24 V	24 V
relative positive tolerance at DC at 24 V	20 %	20 %
relative negative tolerance at DC at 24 V	20 %	20 %
consumed current		
• from external supply voltage at DC at 24 V typical	0.1 A	0.1 A
• from external supply voltage at DC at 24 V maximum	0.22 A	0.22 A

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Technical specifications (continued)

Article number product type designation	6GK7243-7KX30-0XE0 CP 1243-7 LTE EU	6GK7243-7SX30-0XE0 CP 1243-7 LTE US
ambient conditions		
ambient temperature		
• for vertical installation during operation	-20 ... +60 °C	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C	-20 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
relative humidity		
• at 25 °C without condensation during operation maximum	95 %	95 %
protection class IP	IP20	IP20
design, dimensions and weights		
module format	Compact module S7-1200 single width	Compact module S7-1200 single width
width	30 mm	30 mm
height	100 mm	100 mm
depth	75 mm	75 mm
net weight	0.133 kg	0.133 kg
fastening method		
• 35 mm DIN-rail mounting	Yes	Yes
• S7-300 rail mounting	No	No
• wall mounting	Yes	Yes
product features, product functions, product components general		
number of units		
• per CPU maximum	3	3
product functions cloud connectivity		
protocol is supported		
• Message Queuing Telemetry Transport (MQTT)	Yes	Yes
• Advanced Message Queuing Protocol (AMQP)	No	No
product function for cloud connectivity		
• trigger management	Yes	Yes
• time stamping	Yes	Yes
product feature for cloud connectivity buffered message frame memory	No	No
number of active connections for cloud connectivity	1	1
number of data points per device maximum	500	500
performance data		
number of users/telephone numbers definable maximum	10	10
performance data open communication		
number of possible connections for open communication		
• by means of T blocks maximum	like CPU	like CPU
performance data IT functions		
number of possible connections		
• as email client maximum	1	1

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Technical specifications (continued)

Article number product type designation	6GK7243-7KX30-0XE0 CP 1243-7 LTE EU	6GK7243-7SX30-0XE0 CP 1243-7 LTE US
performance data telecontrol		
suitability for use		
• substation	Yes	Yes
control center connection	Telecontrol Server Basic	Telecontrol Server Basic
• by means of a permanent connection	supported	supported
• by means of demand-oriented connection	supported	supported
• note	Connection to SCADA system using OPC interface	Connection to SCADA system using OPC interface
protocol is supported		
• DNP3	Yes	Yes
• IEC 60870-5	Yes	Yes
product function data buffering if connection is aborted	Yes; 64,000 events	Yes; 64,000 events
number of stations for direct communication with Telecontrol Server Basic		
• in send direction maximum	3	3
• in receive direction maximum	15	15
performance data teleservice		
diagnostics function online diagnostics with SIMATIC STEP 7	Yes	Yes
product function		
• program download with SIMATIC STEP 7	Yes	Yes
• remote firmware update	Yes	Yes
product functions management, configuration, engineering		
configuration software		
• required	STEP 7 Basic/Professional	STEP 7 Basic/Professional
product function is supported identification link	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
product functions diagnostics		
product function web-based diagnostics	Yes	Yes
product functions security		
firewall version	stateful inspection	stateful inspection
product function with VPN connection	IPsec, SINEMA RC	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1	MD5, SHA-1
number of possible connections with VPN connection	1	1
product function		
• password protection for teleservice access	Yes	Yes
• encrypted data transmission	Yes	Yes
product functions time		
protocol is supported		
• NTP	Yes	Yes
time synchronization		
• from control center	Yes	Yes
standards, specifications, approvals		
certificate of suitability CE marking	Yes	
certificate of suitability UKCA marking	Yes	
certificate of suitability Regulatory Compliance Mark (RCM)	Yes	
certificate of suitability RoHS conformity	Yes	
certificate of suitability EAC approval	Yes	Yes
standards, specifications, approvals hazardous environments header		
certificate of suitability ATEX	Yes	Yes
certificate of suitability IECEx	Yes	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes	Yes

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Technical specifications (continued)

Article number product type designation	6GK7243-7KX30-0XE0 CP 1243-7 LTE EU	6GK7243-7SX30-0XE0 CP 1243-7 LTE US
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	180.78 kg	180.78 kg
• during manufacturing	15.34 kg	15.34 kg
• during operation	165.22999 kg	165.22999 kg
• after end of life	0.21 kg	0.21 kg
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com

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Overview



The CP 1243-8 IRC (Industrial Remote Communication) communications processor is used for connecting a SIMATIC S7-1200 via the SINAUT ST7 telecontrol protocol to higher-level ST7 stations or to an ST7 control center. The CP 1243-8 IRC (as of HW2 and firmware V3.0) also offers connection to a DNP3 or IEC-capable control center via a corresponding open DNP3 or IEC 60870-5-104 telecontrol protocol. The CP 1243-8 IRC (as of HW2 and firmware V3.0) also offers connection to a DNP3 or IEC-capable control center via a corresponding open DNP3 or IEC 60870-5-104 telecontrol protocol.

The CP has the following features:

- Support for telecontrol protocol SINAUT ST7, DNP3, IEC 60870-5-104
- Two WAN connections for selecting the communication paths:
  - Ethernet-based connection: RJ45 port on the module for connecting external routers, e.g. SCALANCE M
  - Additional connection configurable via plug-in TS modules
- Both WAN interfaces can also be operated simultaneously: Route redundancy
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic transmission of alarms per email or text message
- Time synchronization based on NTP (Network Time Protocol) or via the SINAUT system
- Data buffering of up to 16,000 data frames prevents data loss in the event of temporary connection failures
- Secure communication via VPN connections based on IPsec
- Access protection via Stateful Inspection Firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Fast and simple diagnostics via clear LED indicators, STEP 7 and web browser
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail

The integrated Ethernet interface and the option of using the TS modules provide flexible connection options for the CP. The following TS modules are available:

- TS module RS232
- TS module MODEM
- TS module ISDN

Selection and ordering data

	Article No.
CP 1243-8 IRC communications processor Communications processor for connecting a SIMATIC S7-1200 via the SINAUT ST7 telecontrol protocol to higher-level ST7 stations or to an ST7 control center, or a DNP3 or IEC-capable control center via corresponding DNP3 or IEC 60870-5-104 open telecontrol protocols	6GK7243-8RX30-0XE0

Accessories

	Article No.
SINAUT engineering software V5.5 + SP3 On CD, consisting of: • SINAUT ST7/DNP3 configuration and diagnostic software for STEP 7 V5.6 • SINAUT TD7 block library • Electronic manual in German and English	6NH7997-0CA55-0AA0
SINAUT engineering software V5.5; Upgrade from V5.0, V5.1, V5.2, V5.3 or V5.4	6NH7997-0CA55-0GA0
TeleService modules Connection to TS Adapter IE Basic/Advanced or CP 1243-8 IRC. Power supply via TS Adapter IE Basic/Advanced or CP 1243-8 IRC	
TS module RS232	6ES7972-0MS00-0XA0
TS module MODEM	6ES7972-0MM00-0XA0
CSM 1277 compact switch module Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic Equipment Manual on CD-ROM	6GK7277-1AA10-0AA0

Note:
You can find ordering data for TeleControl Server Basic software under Telecontrol – Control center – TeleControl Server Basic.

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Technical specifications

Article number	6GK7243-8RX30-0XE0
product type designation	CP 1243-8 IRC
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7243-8RX30-0XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
• at the 2nd interface	0.3 ... 115.2 kbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
• for power supply	1
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port
type of electrical connection	
• at interface 2 for external data transmission	Interface to the TS Module
• for power supply	3-pole terminal block
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
supply voltage external	24 V
supply voltage external	19.2 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	19.2 ... 28.8 V
consumed current	
• from backplane bus at DC at 5 V typical	0.25 A
• from external supply voltage at DC at 24 V typical	0.1 A
power loss [W]	2.4 W; 1.25 W from S7-1200 backplane without TS module. 2.4 W from 24 V DC external with TS module
ambient conditions	
ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... -70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20

Technical specifications (continued)

Article number	6GK7243-8RX30-0XE0
product type designation	CP 1243-8 IRC
design, dimensions and weights	
module format	Compact module S7-1200 single width
width	30 mm
height	110 mm
depth	75 mm
net weight	0.122 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	1
• note	One CP pluggable on left side of CPU, one TS Module pluggable left side of CP.
product functions cloud connectivity	
protocol is supported	
• Message Queuing Telemetry Transport (MQTT)	Yes
• Advanced Message Queuing Protocol (AMQP)	No
product function for cloud connectivity	
• trigger management	Yes
• time stamping	Yes
product feature for cloud connectivity buffered message frame memory	No
number of active connections for cloud connectivity	1
number of data points per device maximum	500
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	like CPU
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	Configured S7-Connection for ST7-Communication
• with PG connections maximum	2
• with OP connections maximum	1
service	
• SINAUT ST7 via S7 communication	Yes
performance data IT functions	
number of possible connections	
• as email client maximum	1

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Technical specifications (continued)

Article number	6GK7243-8RX30-0XE0
product type designation	CP 1243-8 IRC
performance data telecontrol	
suitability for use	
• node station	No
• substation	Yes
• TIM control center	No
• note	Ethernet and TS Module can be operated in parallel
control center connection	control center with ST7 function
• by means of a permanent connection	supported
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST7 protocol	Yes
product function data buffering if connection is aborted	Yes; DNP3, IEC60870-5: 64000 events, SINAUT ST7: 16000 telegrams
number of data points per device maximum	500
transmission format	
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST7 protocol	Polling
• with dial-up network with SINAUT ST7 protocol	spontaneous
hamming distance	
• for SINAUT ST7 protocol	4
performance data teleservice	
diagnostics function online diagnostics with SIMATIC STEP 7	Yes
product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes
product functions management, configuration, engineering	
protocol is supported	
• SNMP v3	Yes
• DCP	Yes
configuration software	
• required	SINAUT ES V5.5 and STEP7 V13 SP1 or higher
• for PG configuring required SINAUT ST7 configuration software for PG	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes

Technical specifications (continued)

Article number	6GK7243-8RX30-0XE0
product type designation	CP 1243-8 IRC
product functions security	
firewall version	stateful inspection
operating mode Virtual Private Network (VPN)	Yes
product function with VPN connection	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1
number of possible connections with VPN connection	8
product function	
• password protection for teleservice access	No
• encrypted data transmission	Yes
• MSC client via GPRS modem with MSC capability	Yes
protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
key length for MSC with Virtual Private Network	128 bit
number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	0
product functions time	
protocol is supported	
• NTP	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	89.58 kg
• during manufacturing	14.29 kg
• during operation	75.11 kg
• after end of life	0.18 kg

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Technical specifications (continued)

Article number	6GK7243-8RX30-0XE0
product type designation	CP 1243-8 IRC
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



The SIMATIC RF120C is a communications module for connecting the SIMATIC identification systems directly to the SIMATIC S7-1200. The readers of the RF200/300/1000 RFID systems as well as the MV300/400/500 optical readers can be operated on the SIMATIC RF120C.

Integration into the TIA Portal and the uniform plug-in connection systems permit fast and simple commissioning.

Selection and ordering data

	Article No.
SIMATIC RF120C communications module Integrated in the S7-1200 PLC for connection of a reader	**6GT2002-0LA00**
Accessories for all readers	
Reader cable for SIMATIC RF200 / RF300 / MV400 PUR material, trailable, straight reader connector	
	
2 m	**6GT2091-4LH20**
5 m	**6GT2091-4LH50**
10 m	**6GT2091-4LN10**
Connecting cable for SIMATIC RF1000 Prefabricated RS232, between RF1040R or RF1070R and RF120C; black, length 2 m	**6GT2891-6UH20**
Connecting cable for SIMATIC MV320 Pre-assembled, between RF120C and MV320, coiled, length 5 m, usable length 1.6 to 4 m	**6GT2191-1BH50**
Accessories for extended use	
Extension cable for all readers PUR material, trailable.	
	
	
2 m, straight plug	**6GT2891-4FH20**
5 m, straight plug	**6GT2891-4FH50**
10 m, straight plug	**6GT2891-4FN10**
20 m, straight plug	**6GT2891-4FN20**
50 m, straight plug	**6GT2891-4FN50**
2 m, plug angled at reader	**6GT2891-4JH20**
5 m, plug angled at reader	**6GT2891-4JH50**
10 m, plug angled at reader	**6GT2891-4JN10**

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Technical specifications

Article number	6GT2002-0LA00
product type designation	RF120C communication module
product brand name	SIMATIC RF
Technical Product Detail Page	https://i.siemens.com/1P6GT2002-0LA00
suitability for operation	SIMATIC S7-1200 together with RF200/300/1000, MV300/400/500, MOBY D/U
transfer rate	
transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
interfaces	
design of the interface for point-to-point connection	RS422/RS232
number of readers connectable	1
type of electrical connection	
• of the backplane bus	S7-1200 backplane bus
• for supply voltage	Screw terminals
design of the interface to the reader for communication	sub-D, 9-pin, female
mechanical data	
material	Xantar MX 1094
color	Ti-grey 24L01
tightening torque of the screw for securing the equipment maximum	0.45 N·m
supply voltage, current consumption, power loss	
supply voltage at DC	
• rated value	24 V
•	20 ... 30 V
consumed current	
• at DC at 24 V without connected devices typical	0.03 A
• from supply voltage 1L+ maximum	1 A
ambient conditions	
ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
protection class IP	IP20
shock resistance	According to IEC 61131-2
shock acceleration	300 m/s²
vibrational acceleration	100 m/s²
design, dimensions and weights	
width	30 mm
height	100 mm
depth	75 mm
net weight	0.15 kg
fastening method	S7-1200 rack
wire length for RS 422 interface maximum	1 000 m
product features, product functions, product components general	
display version	4 LEDs for reader connection, 1 LED for device status
product function addressable transponder file handler	No
protocol is supported	
• S7 communication	Yes

Technical specifications (continued)

Article number	6GT2002-0LA00
product type designation	RF120C communication module
product functions management, configuration, engineering	
type of parameterization	HSP, TO
type of programming	ID profile, library with functions
type of computer-switched communication	acyclic communication
standards, specifications, approvals	
certificate of suitability	CE, FCC, cULus, KCC, C-Tick, FM
certificate of suitability	
• IECEx	Yes
• for IECEx as marking	Ex: II 3G Ex nAA IIC T4 Gc
MTBF	196 a
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	35.75 kg
• during manufacturing	16 kg
• during operation	19.62 kg
• after end of life	0.13 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to web page: identification and localization systems	https://www.siemens.com/ident
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CM 1241 communications module	
(Extended temperature range and exposure to environmental substances)	
Ambient temperature -40 ... +70° C	
Communications module for point-to-point connection, with one RS232 interface	**6AG1241-1AH32-2XB0**
Communications module for point-to-point connection, with one RS 485 interface	**6AG1241-1CH32-2XB0**
For areas with extreme exposure to environmental substances (conformal coating)	
Communications module for point-to-point connection, with one RS232 interface	**6AG1241-1AH32-4XB0**
Communications module for point-to-point connection, with one RS 485 interface	**6AG1241-1CH32-4XB0**
Accessories	See SIMATIC S7-1200 CM 1241 communications module

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Technical specifications

Article number	6AG1241-1AH32-4XB0 SIPLUS S7-1200 CM 1241 RS232	6AG1241-1AH32-2XB0 SIPLUS S7-1200 CM1241 RS232	6AG1241-1CH32-4XB0 SIPLUS S7-1200 CM 1241 RS422/485	6AG1241-1CH32-2XB0 SIPLUS S7-1200 CM 1241 RS422/485
General information				
Product type designation	CM 1241 RS 232	CM 1241 RS 232	CM 1241 RS 422 / 485	CM 1241 RS 422 / 485
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Input current				
Current consumption, max.	200 mA; From backplane bus 5 V DC	200 mA; From backplane bus 5 V DC	220 mA; From backplane bus 5 V DC	220 mA; From backplane bus 5 V DC
Interfaces				
Interfaces/bus type	RS 232C (V.24)	RS 232C (V.24)	RS 422 / 485 (X.27)	RS 422 / 485 (X.27)
Number of interfaces	1	1	1	1
Point-to-point connection				
• Cable length, max.	10 m	10 m	1 000 m	1 000 m
- Integrated protocol driver				
- Freeport	Yes	Yes	Yes	Yes
- ASCII	Yes; Available as library function	Yes; Available as library function	Yes; Available as library function	Yes; Available as library function
- Modbus RTU master	Yes	Yes	Yes	Yes
- Modbus RTU device	Yes	Yes	Yes	Yes
- USS			Yes; Available as library function	Yes; Available as library function
Protocols				
Integrated protocols				
- Freeport				
- Telegram length, max.	1 kbyte	1 kbyte	1 kbyte	1 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 (Standard), 2	1 (Standard), 2	1 (Standard), 2	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
- 3964 (R)				
- Telegram length, max.	1 kbyte	1 kbyte	1 kbyte	1 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 (Standard), 2	1 (Standard), 2	1 (Standard), 2	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
- Modbus RTU master				
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
- max. number of devices	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
- Modbus RTU device				
- Address area			1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• for status of the outputs	Yes	Yes	Yes	Yes
Degree and class of protection				
IP degree of protection	IP20	IP20	IP20	IP20

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Technical specifications (continued)

Article number	6AG1241-1AH32-4XB0 SIPLUS S7-1200 CM 1241 RS232	6AG1241-1AH32-2XB0 SIPLUS S7-1200 CM1241 RS232	6AG1241-1CH32-4XB0 SIPLUS S7-1200 CM 1241 RS422/485	6AG1241-1CH32-2XB0 SIPLUS S7-1200 CM 1241 RS422/485
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; Tmax > 60 °C, derating: Max. one module may be configured; this module must be the last module on the CM bus; minimum clearance on the left side of at least 45 mm
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)

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Technical specifications (continued)

Article number	6AG1241-1AH32-4XB0 SIPLUS S7-1200 CM 1241 RS232	6AG1241-1AH32-2XB0 SIPLUS S7-1200 CM1241 RS232	6AG1241-1CH32-4XB0 SIPLUS S7-1200 CM 1241 RS422/485	6AG1241-1CH32-2XB0 SIPLUS S7-1200 CM 1241 RS422/485
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions				
Width	30 mm	30 mm	30 mm	30 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
Weights				
Weight, approx.	150 g	150 g	155 g	155 g

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Overview

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CB 1241 RS485 communication board for point-to-point connection, with 1 RS485 interface	**6AG1241-1CH30-5XB1**
Accessories	See SIMATIC CB 1241 RS485 communication board

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Technical specifications

Article number	6AG1241-1CH30-5XB1 SIPLUS S7-1200 CB 1241 RS485
General information	
Product type designation	CB 1241 RS 485
Input current	
from backplane bus 5 V DC, typ.	50 mA
Interfaces	
Point-to-point connection	
• Cable length, max.	1 000 m
- Integrated protocol driver	
- Freeport	Yes
- ASCII	Yes; Available as library function
- Modbus RTU master	Yes
- Modbus RTU device	Yes
- USS	Yes; Available as library function
Protocols	
Integrated protocols	
- Freeport	
- Telegram length, max.	1 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
- 3964 (R)	
- Telegram length, max.	1 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
- Modbus RTU master	
- Address area	1 through 49 999 (Standard Modbus addressing)
- max. number of devices	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Degree and class of protection	
IP degree of protection	IP20

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Technical specifications (continued)

Article number	6AG1241-1CH30-5XB1 SIPLUS S7-1200 CB 1241 RS485
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g

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Overview



DP-M	DP-S	FMS	PG/OP	S7
	●			

G_IK10_XX_10322

The SIPLUS CM 1242-5 communications module is used to connect a SIPLUS S7-1200 controller to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 Kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of S7-1200 for optimal production.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-1200 CM 1242-5	
Article No.	**6AG1 242-5DX30-2XE0**
Article No. based on	**6GK7 242-5DX30-0XE0**
Range of ambient temperature	-25 ... +55 °C
Ambient conditions	Suitable for exceptional exposure to environmental substances (e.g. sulfur chlorine atmosphere).
Technical specifications	The technical data of the standard product applies except for the ambient conditions.

Overview (continued)

Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see range of ambient temperature 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

Selection and ordering data

SIPLUS CM 1242-5 communications module (Extended temperature range and exposure to environmental substances) Communications module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave	**6AG1242-5DX30-2XE0**
Accessories	See SIMATIC S7-1200 CM 1242-5 communications module

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Technical specifications

Article number product type designation	6AG1242-5DX30-2XE0 CM 1242-5
product brand name	SIPLUS
Technical Product Detail Page	https://i.siemens.com/1P6AG1242-5DX30-2XE0
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
• for power supply	0
type of electrical connection	
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS485)
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
power loss [W]	0.75 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-25 ... +45 °C
• for horizontally arranged busbars during operation	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity	
• with condensation according to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
resistance to chemically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes
resistance to mechanically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
type of test of the coating according to MIL-I-46058C	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, class A
protection class IP	IP20

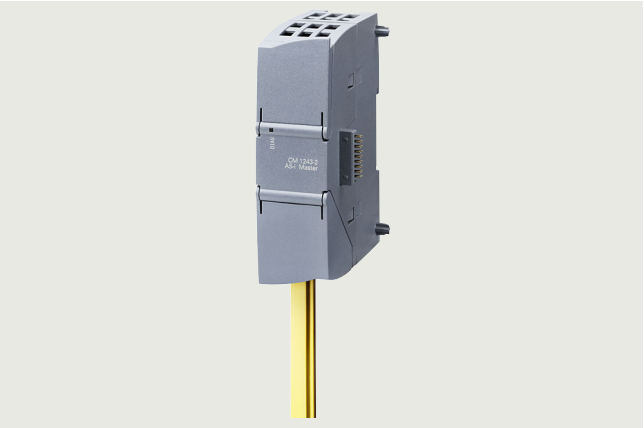
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Technical specifications (continued)

Article number product type designation	6AG1242-5DX30-2XE0 CM 1242-5
design, dimensions and weights	
module format	Compact module S7-1200 single width
width	30 mm
height	100 mm
depth	75 mm
net weight	0.115 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	3
performance data PROFIBUS DP	
service as DP device	
• DPV0	Yes
• DPV1	Yes
data volume	
• of the address range of the inputs as DP device total	240 byte
performance data telecontrol	
protocol is supported	
• TCP/IP	No
product functions management, configuration, engineering	
configuration software	
• required	STEP 7 Basic V11.0 or higher
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



The CM 1243-2 communications module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- Indication of the operating state on the front of the device via LED
- Indication of operating mode, AS-Interface voltage faults, configuration errors and I/O faults via LEDs behind the front flap
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-Interface with 30 V voltage and AS-i Power24V: In combination with the optional DCM 1271 data decoupling module, a standard 24 V power supply unit can be used
- Configuration and diagnostics via the TIA Portal

Installation

The CM 1243-2 communications module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It incorporates:

- Terminals for two AS-i cables (internally bridged) via two screw terminals each
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in the scope of supply) can be removed to facilitate installation

Function

The CM 1243-2 supports all specified functions of the AS-Interface Specification V3.0.

The values of the digital AS-i slaves can be addressed via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be accessed directly in the process image.

It is also possible to exchange all data of the AS-i master and the connected AS-i slaves with the S7-1200 via the data record interface.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

Overview (continued)

The optional DCM 1271 data decoupling unit **(see "Ordering data for accessories")** has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A. For more information on DCM 1271, **see "Power supplies and data decoupling units" → "Data decoupling units for S7-1200"**.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions can constitute an integral element of such a concept.

For more information about industrial security, **please visit** www.siemens.com/industrialsecurity.

Configuration

To configure CM 1243-2, you require STEP 7 V11 + SP2 or higher.

For STEP 7 V11 + SP2 or higher, the additional Hardware Support Package for CM 1243-2 is required. This is available from the Industry Online Support Portal, **see** https://support.industry.siemens.com/cs/ww/en/view/72341852.

The software enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CM 1243-2 communications module (Extended temperature range and exposure to environmental substances) • AS-Interface master for SIMATIC S7-1200 • Corresponds to AS-Interface Specification V3.0 • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W × H × D/ mm) 30 × 100 × 75	**6AG1243-2AA30-7XB0**
Accessories	See S7-1200 CM 1243-2 communications module

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Technical specifications

Article number product type designation	6AG1243-2AA30-7XB0 CM 1243-2
supply voltage, current consumption, power loss	
power loss [W]	2.9 W
ambient conditions	
installation altitude at height above sea level maximum	2 000 m
protection class IP	IP20
design, dimensions and weights	
module format	S7-1200 design
product features, product functions, product components general	
number of units per CPU maximum	3
performance data telecontrol	
protocol is supported TCP/IP	No

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Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

G_IK10_XX_10323

The CM 1243-5 communications module is used to connect a SIMATIC S7-1200 controller to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows the connection of programming devices and operator panels with a PROFIBUS interface to S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 Kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of S7-1200 for optimal production.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-1200 CM 1243-5	
Article No.	**6AG1 243-5DX30-2XE0**
Article No. based on	**6GK7 243-5DX30-0XE0**
Range of ambient temperature	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to environmental substances (e.g. sulfur chlorine atmosphere).
Technical specifications	The technical data of the standard product applies except for the ambient conditions.

Overview (continued)

Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see range of ambient temperature 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

Selection and ordering data

SIPLUS CM 1243-5 communications module (Extended temperature range and exposure to environmental substances) Communications module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	**6AG1243-5DX30-2XE0**
Accessories	See SIMATIC S7-1200 CM 1243-5 communications module

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Technical specifications

Article number product type designation	6AG1243-5DX30-2XE0 CM 1243-5
product brand name	SIPLUS
Technical Product Detail Page	https://i.siemens.com/1P6AG1243-5DX30-2XE0
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
• for power supply	1
type of electrical connection	
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	3-pole terminal block
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage external	24 V
supply voltage external at DC rated value	24 V
relative positive tolerance at DC at 24 V	20 %
relative negative tolerance at DC at 24 V	20 %
consumed current	
• from external supply voltage at DC at 24 V typical	0.1 A
power loss [W]	2.4 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-25 ... +45 °C
• for horizontally arranged busbars during operation	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity	
• with condensation according to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
resistance to chemically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes
resistance to mechanically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
type of test of the coating according to MIL-I-46058C	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, class A
protection class IP	IP20

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Technical specifications (continued)

Article number product type designation	6AG1243-5DX30-2XE0 CM 1243-5
design, dimensions and weights	
module format	Compact module S7-1200 single width
width	30 mm
height	100 mm
depth	75 mm
net weight	0.134 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	3
performance data PROFIBUS DP	
service as DP master	
• DPV1	Yes
number of DP devices	
• on DP master operable	32
data volume	
• of the address range of the inputs as DP master total	512 byte
• of the address range of the outputs as DP master total	512 byte
• of the address range of the inputs per DP device	244 byte
• of the address range of the outputs per DP device	244 byte
• of the address range of the diagnostic data per DP device	240 byte
service as DP device	
• DPV0	No
• DPV1	No
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	8; max. 4 connections to other S7 stations
• with PG connections maximum	1
• with PG/OP connections maximum	3
performance data multi-protocol mode	
number of active connections with multi-protocol mode	
• without DP maximum	8
• with DP maximum	8
performance data telecontrol	
protocol is supported	
• TCP/IP	No
product functions management, configuration, engineering	
configuration software	
• required	STEP 7 Basic/Professional
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



The CP 1243-1 communications processor is used for connecting the SIMATIC S7-1200 to telecontrol centers via remote networks and telecontrol protocols (DNP3, IEC 60870-5-104, TeleControl Basic), and for safe communication via IP-based networks.

The CP has the following features:

- Ethernet-based connection to TeleControl Server Basic, e.g. via internet
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures
- Secure communication via VPN connections based on IPsec
- Access protection via Stateful Inspection Firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CP 1243-1 communications module (Extended temperature range and exposure to environmental substances) Communications processor for connecting SIMATIC S7-1200 as an additional Ethernet interface and for connection to control centers via telecontrol protocols (DNP3, IEC 60870, TeleControl Basic), security (firewall, VPN)	**6AG1243-1BX30-2AX0**
Accessories	See SIMATIC S7-1200 CP 1243-1 communications processor

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Technical specifications

Article number product type designation	6AG1243-1BX30-2AX0 CP 1243-1
product brand name	SIPLUS
Technical Product Detail Page	https://i.siemens.com/1P6AG1243-1BX30-2AX0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
• for power supply	0
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	5 V
consumed current	
• from backplane bus at DC at 5 V typical	0.25 A
power loss [W]	1.25 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-40 ... +60 °C
• for horizontally arranged busbars during operation	-40 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity	
• with condensation according to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
resistance to chemically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes
resistance to mechanically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1
type of test of the coating according to MIL-I-46058C	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, class A
protection class IP	IP20

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Technical specifications (continued)

Article number product type designation	6AG1243-1BX30-2AX0 CP 1243-1
design, dimensions and weights	
module format	Compact module S7-1200 single width
width	30 mm
height	110 mm
depth	75 mm
net weight	0.122 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• wall mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	3
product functions cloud connectivity	
protocol is supported	
• Message Queuing Telemetry Transport (MQTT)	Yes
• Advanced Message Queuing Protocol (AMQP)	No
product function for cloud connectivity	
• trigger management	Yes
• time stamping	Yes
product feature for cloud connectivity buffered message frame memory	No
number of active connections for cloud connectivity	1
number of data points per device maximum	500
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	like CPU
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	like CPU
performance data IT functions	
number of possible connections	
• as email client maximum	1
performance data telecontrol	
suitability for use	
• node station	No
• substation	Yes
• TIM control center	No
control center connection	For use with TeleControl Server Basic, WinCC and PCS7
• by means of a permanent connection	supported
• note	Connection to SCADA system via Telecontrol Server Basic and Standard Telecontrol protocols
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
product function data buffering if connection is aborted	Yes; 64,000 events
number of data points per device maximum	200
number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
performance data teleservice	
diagnostics function online diagnostics with SIMATIC STEP 7	Yes
product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes

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Technical specifications (continued)

Article number product type designation	6AG1243-1BX30-2AX0 CP 1243-1
product functions management, configuration, engineering	
configuration software	
• required	STEP 7 Basic/Professional
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes
product functions security	
firewall version	stateful inspection
product function with VPN connection	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1, SHA-2
number of possible connections with VPN connection	8
product function	
• password protection for Web applications	No
• password protection for teleservice access	No
• encrypted data transmission	Yes
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	No
product functions time	
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



- Unmanaged switch for connecting a SIPLUS S7-1200 controller to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIPLUS S7-1200 controller for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIPLUS S7-1200 mounting rail
- Low-cost solution for implementing small, local Ethernet networks
- Problem-free connection using RJ45 plugs
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

SIPLUS NET CSM 1277	
Article No.	**6AG1 277-1AA10-4AA0**
Article No. based on	**6GK7 277-1AA10-0AA0**
Range of ambient temperature	0 ... +60 °C

Selection and ordering data

	Article No.
SIPLUS NET CSM 1277 compact switch module	
(Extended temperature range and exposure to environmental substances)	
Unmanaged switch for the connection of a SIPLUS S7-1200 Controller and as many as three other nodes to an Industrial Ethernet operating at 10/100 Mbps; With conformal coating, -40 ....+70 °C,	**6AG1277-1AA10-2AA0**
Unmanaged switch for the connection of a SIPLUS S7-1200 Controller and as many as three other nodes to an Industrial Ethernet operating at 10/100 Mbps; With conformal coating, 0 ....+60 °C,	**6AG1277-1AA10-4AA0**
Accessories	See CSM 1277 unmanaged

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Technical specifications

Article number	6AG1277-1AA10-2AA0	6AG1277-1AA10-4AA0
product type designation		
product brand name	SIPLUS	SIPLUS
product type designation	CSM 1277	CSM 1277
Technical Product Detail Page	https://i.siemens.com/1P6AG1277-1AA10-2AA0	https://i.siemens.com/1P6AG1277-1AA10-4AA0
transfer rate		
transfer rate	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
ambient conditions		
ambient temperature in horizontal mounting position during operation	-40 ... +70 °C; > 60 °C ambient temperature on both sides 25 mm clearance on the left and right of the module to adjacent devices	0 ... 60 °C
installation altitude at height above sea level maximum	5 000 m	5 000 m
relative humidity		
• with condensation according to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets	Yes; incl. airborne diesel and oil droplets
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
resistance to biologically active substances		
• conformity according to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna); class 3B3 on request	Yes; Class 3B2 mold and fungal spores (excluding fauna); class 3B3 on request
• conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
resistance to chemically active substances		
• conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
• conformity according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (Severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (Severity degree 3); *
resistance to mechanically active substances		
• conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
• conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
environmental category according to IEC 60721 note	* The supplied plug covers must remain in place on the unused interfaces during operation!	* The supplied plug covers must remain in place on the unused interfaces during operation!
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; protection of the type 1	Yes; protection of the type 1
type of test of the coating according to MIL-I-46058C	Yes; coating discoloration during service life possible	Yes; coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; conformal coating, class A	Yes; conformal coating, class A
protection class IP	IP20	IP20
design, dimensions and weights		
width	75 mm	75 mm
height	100 mm	100 mm
depth	45 mm	45 mm
net weight	0.2 kg	0.2 kg
product functions management, configuration, engineering		
product function		
• switch-managed	No	No
standards, specifications, approvals		
certificate of suitability		
• CE marking	Yes	Yes
standard		
• for EMC interference emission	EN 61000-6-4 (Class A)	EN 61000-6-4 (Class A)
• for immunity to EMC	EN 61000-6-2	EN 61000-6-2

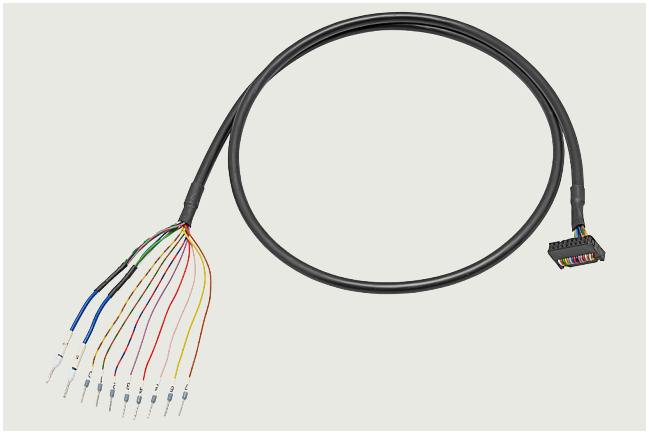
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Technical specifications (continued)

Article number	6AG1277-1AA10-2AA0	6AG1277-1AA10-4AA0
product functions general		
MTBF	273 a	273 a
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com

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Overview



SIMATIC TOP connect universal connecting cable

The wiring of the

- SIMATIC S7-1500 IO (25 mm)
- SIMATIC ET 200SP
- SIMATIC S7-1200
- LOGO!

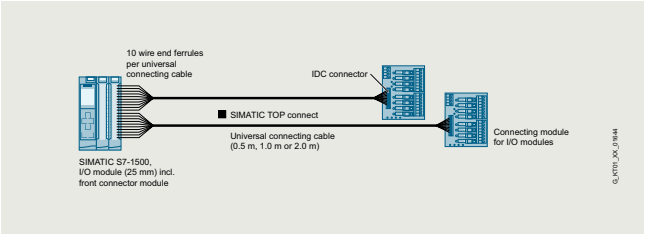
with the sensors/actuators is a significant factor with respect to time/cost overhead during configuration, control cabinet design, procurement and ease of servicing. The SIMATIC TOP connect system cabling makes connection easy, fast and secure.

Design

The unshielded universal connection cable is offered for a wide range of control cabinet concepts.

It comprises:

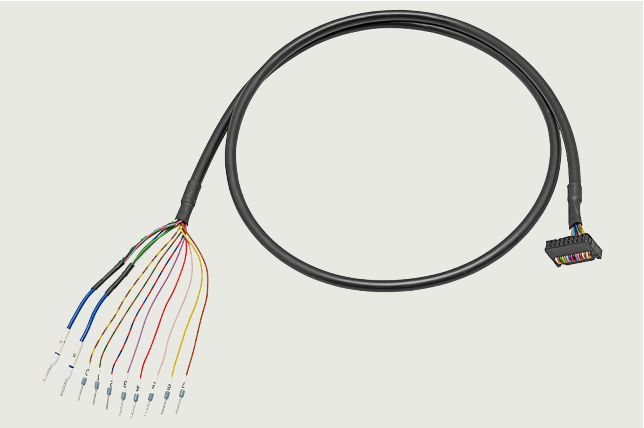
- 16-pin round cable with a core cross-section of 0.14 mm^2, pre-assembled with wire end ferrules for connection to the controller:
  - Labeled with "0" ... "7" for the control inputs/outputs
  - Labeled with "M" for mass
  - Labeled with "L+" for 24 V DC potential
- 16-pin ID (insulation displacement) connector for connection to the SIMATIC TOP connect connection modules for 8 I/Os:
  - 3-wire connection using the appropriate connection module for quick, error-free wiring
  - Galvanic isolation and adaptation using a coupling relay for easy implementation of potential groups in the system
  - High output current (up to 4 A), even for higher switching frequencies, using an optocoupler module (overload and short-circuit proof)
  - Implementation of isolating terminals using switch modules enabling individual signals to be measured
  - Channel-wise protection of I/Os using a fuse module with a thermal fuse



SIMATIC TOP connect universal connection cable

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Overview



SIMATIC TOP connect universal connecting cable

The universal connecting cable constitutes the link between the standard connection of the SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 or LOGO! and the SIMATIC TOP connect terminal module. It transmits 8 signals and the supply voltage. The connecting cable is available in lengths of 0.5 m / 1.0 m / 2.0 m. the maximum technically feasible length is 30 m.

Selection and ordering data

Designation	Article No.
Universal connecting cables for SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 and LOGO!	
16 x 0.14 mm² unshielded	
• 0.5 m	**6ES7923-0BA50-0FB0**
• 1.0 m	**6ES7923-0BB00-0FB0**
• 2.0 m	**6ES7923-0BC00-0FB0**

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Overview

The connection modules are used instead of conventional terminal blocks and act as the interface between the PLC and signals from the field. All digital modules with 8 I/Os can be used.

Selection and ordering data

TP1 connection module	
For 1-conductor connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0AA20-0BA0**
TP3 connection module	
For 3-conductor connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0CA20-0BA0**
• Push-in terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BC0**
• Screw-type terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BA0**
• Push-in terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BA0**
TPRo connection module	
Relay module for 8 outputs, relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BD20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BD20-0BA0**
TPRi connection module	
Relay module for 8 inputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
TPRi connection module	
Relay module for 8 inputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**
TPOo connection module	
Optocoupler module for 8 outputs (max. 24 V DC/4 A)	
• Push-in terminals with LEDs	**6ES7924-0BF20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BF20-0BA0**

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Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

Selection and ordering data

SIMATIC S7-1200, SM 1226 digital input module F-DI 16x 24 V DC, PROFIsafe, 70 mm size, up to PLe (ISO 13849-1)/ SIL3 (IEC 61508)	**6ES7226-6BA32-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 32CH (4 units with 11 screws each)	**6ES7292-1AL30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 70 mm (signal module 70 mm wide front flap top & bottom) 6 units each	**6ES7291-1BB30-0XA0**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
STEP 7 Safety Basic V19 **Task:** Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC **Requirement:** STEP 7 Basic V19 or higher Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Basic V19, engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V19 as of STEP 7 Basic V19; for configuring SIMATIC S7-1200F Content: 1x USB	**6ES7833-1FB23-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Basic V19, engineering software; floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V19 as of STEP 7 Basic V19; for configuring SIMATIC S7-1200F Consignee email address required for delivery	**6ES7833-1FB23-0YH5**

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Selection and ordering data (continued)

1) Up-to-date information and download availability can be found at this link.

Technical specifications

Article number	6ES7226-6BA32-0XB0 Digital Input SM 1226, F-DI 16x 24VDC
General information	
Product type designation	SM 1226, F-DI 16x24 V DC
Supply voltage	
Rated value (DC)	24 V
Input current	
from backplane bus 5 V DC, max.	155 mA; Current consumption (SM Bus, 5 V DC): 155 mA
Digital inputs	
• from load voltage L+ (without load), max.	130 mA; 130 mA + 6 mA / input used + any Vs1/Vs2 current used
Digital inputs	
Number of digital inputs	16; 16 (1oo1) or 8 (1oo2); Note: You can individually assign each pair of inputs "a.x" and "b.x" as a single (1oo2)-channel or as 2 separate (1oo1)-channels
Input voltage	
• for signal "0"	-30 V DC to +5 V DC
• for signal "1"	15 V DC to 30 V DC
Input current	
• for signal "1", typ.	5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	250 g

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Selection and ordering data

SIMATIC S7-1200, SM 1226 digital output module F-DQ 4x 24 V DC 2 A, PROFIsafe, 70 mm size, up to PLe (ISO 13849-1)/ SIL3 (IEC 61508)	**6ES7226-6DA32-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Digital signal module 32CH (4 units with 11 screws each)	**6ES7292-1AL30-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 70 mm (signal module 70 mm wide front flap top & bottom) 6 units each	**6ES7291-1BB30-0XA0**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
STEP 7 Safety Basic V19 **Task:** Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC **Requirement:** STEP 7 Basic V19 or higher Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Basic V19, engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V19 as of STEP 7 Basic V19; for configuring SIMATIC S7-1200F Content: 1x USB	**6ES7833-1FB23-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Basic V19, engineering software; floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V19 as of STEP 7 Basic V19; for configuring SIMATIC S7-1200F Consignee email address required for delivery	**6ES7833-1FB23-0YH5**

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Selection and ordering data (continued)

1) Up-to-date information and download availability can be found at this link.

Technical specifications

Article number	6ES7226-6DA32-0XB0 Digital Output SM 1226, F-DQ 4x 24VDC
General information	
Product type designation	SM 1226 F-DQ 4x 24 VDC
Input current	
from backplane bus 5 V DC, max.	125 mA
Digital outputs	
• from load voltage L+, max.	170 mA
Digital outputs	
Number of digital outputs	4
• in groups of	1
Short-circuit protection	Yes
Switching capacity of the outputs	
• with resistive load, max.	30 Hz
• on lamp load, max.	10 Hz
Output voltage	
• Rated value (DC)	24 V
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	P-switch: 0.5 mA, maximum; M-switch: 0.5 mA, maximum
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	270 g

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Overview



- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Selection and ordering data

SIMATIC S7-1200, SM 1226 relay output F-DQ 2x RLY 5 A, PROFIsafe, 70 mm size, up to PLe (ISO 13849-1)/ SIL3 (IEC 61508)	**6ES7226-6RA32-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200, spare part, tin-coated I/O terminal block Encoded right, digital signal module 32CH (4 units with 11 screws each)	**6ES7292-1AL40-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200, spare part front flaps signal module 70 mm (signal module 70 mm wide front flap top & bottom) 6 units each	**6ES7291-1BB30-0XA0**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
STEP 7 Safety Basic V19 **Task:** Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC **Requirement:** STEP 7 Basic V19 or higher Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Basic V19, engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V19 as of STEP 7 Basic V19; for configuring SIMATIC S7-1200F Content: 1x USB	**6ES7833-1FB23-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Basic V19, engineering software; floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V19 as of STEP 7 Basic V19; for configuring SIMATIC S7-1200F Consignee email address required for delivery	**6ES7833-1FB23-0YH5**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7226-6RA32-0XB0 Digital Output SM 1226, F-DQ 2x Relay
General information	
Product type designation	SM 1226, F-DQ 2x relay/5 A
Input current	
from backplane bus 5 V DC, max.	120 mA
Digital outputs	
• from load voltage L+, max.	300 mA
Digital outputs	
Number of digital outputs	2
Short-circuit protection	No
Output voltage	
• Rated value (DC)	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC
Relay outputs	
• Number of relay outputs	2; 2 circuits per output
- Switching capacity of contacts	
- with inductive load, max.	0.1 Hz, accordance with IEC 60947-5-1, DC-13; 2 Hz, accordance with IEC 60947-5-1, AC-15
- with resistive load, max.	2 Hz
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	300 g

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Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SM 1226 fail-safe digital input signal module (Extended temperature range and environmental stress) 16 inputs, 24 V DC (SIL 2/category 3/PL d) or 8 inputs 24 V DC (SIL 3/category 3 or category 4/PL e) or a combination of both	**6AG1226-6BA32-5XB0**
Accessories	See SIMATIC SM 1226 fail-safe digital input signal module

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Technical specifications

Article number	6AG1226-6BA32-5XB0 SIPLUS S7-1200 SM 1226 F-DI 16x24VDC
General information	
Product type designation	SM 1226, F-DI 16x24 V DC
Supply voltage	
Rated value (DC)	24 V
Input current	
from backplane bus 5 V DC, max.	155 mA; Current consumption (SM Bus, 5 V DC): 155 mA
Digital inputs	
• from load voltage L+ (without load), max.	130 mA; 130 mA + 6 mA / input used + any Vs1/Vs2 current used
Digital inputs	
Number of digital inputs	16; 16 (1oo1) or 8 (1oo2); Note: You can individually assign each pair of inputs "a.x" and "b.x" as a single (1oo2)-channel or as 2 separate (1oo1)-channels
Input voltage	
• for signal "0"	-30 V DC to +5 V DC
• for signal "1"	15 V DC to 30 V DC
Input current	
• for signal "1", typ.	5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1226-6BA32-5XB0 SIPLUS S7-1200 SM 1226 F-DI 16x24VDC
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	250 g

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SM 1226 fail-safe digital output module 4 outputs; 24 V DC, current sourcing/sinking	**6AG1226-6DA32-5XB0**
Accessories	See SIMATIC SM 1226 fail-safe digital output signal module

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Technical specifications

Article number	6AG1226-6DA32-5XB0 SIPLUS S7-1200 SM 1226 F-DQ 4x24VDC
General information	
Product type designation	SM 1226, F-DQ 4x24 V DC/0.5 A
Input current	
from backplane bus 5 V DC, max.	125 mA
Digital outputs	
• from load voltage L+, max.	170 mA
Digital outputs	
Number of digital outputs	4
• in groups of	1
Short-circuit protection	Yes
Switching capacity of the outputs	
• with resistive load, max.	30 Hz
• on lamp load, max.	10 Hz
Output voltage	
• Rated value (DC)	24 V
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	P-switch: 0.5 mA, maximum; M-switch: 0.5 mA, maximum
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1226-6DA32-5XB0 SIPLUS S7-1200 SM 1226 F-DQ 4x24VDC
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	270 g

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Overview



- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SM 1226 fail-safe relay output signal module 2 relay outputs	**6AG1226-6RA32-5XB0**
Accessories	See SIMATIC SM 1226 fail-safe relay output signal module

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Technical specifications

Article number	6AG1226-6RA32-5XB0 SIPLUS S7-1200 SM 1226 F-DQ 2xRelay
General information	
Product type designation	SM 1226, F-DQ 2x relay/5 A
Input current	
from backplane bus 5 V DC, max.	120 mA
Digital outputs	
• from load voltage L+, max.	300 mA
Digital outputs	
Number of digital outputs	2
Short-circuit protection	No
Output voltage	
• Rated value (DC)	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC
Relay outputs	
• Number of relay outputs	2; 2 circuits per output
- Switching capacity of contacts	
- with inductive load, max.	0.1 Hz, accordance with IEC 60947-5-1, DC-13; 2 Hz, accordance with IEC 60947-5-1, AC-15
- with resistive load, max.	2 Hz
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1226-6RA32-5XB0 SIPLUS S7-1200 SM 1226 F-DQ 2xRelay
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	300 g

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Overview



The design and functionality of the SIMATIC PM 1207 one-phase load current supplies (PM = power module) are optimally matched to the SIMATIC S7-1200 controllers. They provide the supply to CPUs with 24 V input as well as to signal modules, and to 24 V loads connected to the modules. Comprehensive certifications such as UL and DNV GL enable universal use.

Selection and ordering data

SIMATIC S7-1200 PM 1207 Input: 120/230 V AC Output: 24 V DC/2.5 A	**6EP1332-1SH71**

Technical specifications

Article number	**6EP1332-1SH71**
product brand name	**SIMATIC**
type of current supply	**24 V/2.5 A**
General information	
Technical Product Detail Page	https://i.siemens.com/1P6EP1332-1SH71
product brand name	SIMATIC
product type designation	PM 1207
product designation	S7-1200 Power Module
type of current supply	24 V/2.5 A
input	
type of the power supply network	1-phase AC
phase number	1
voltage curve at input	AC
supply voltage at AC	Automatic range selection
supply voltage	120 V/230 V
input voltage 1 at AC	85 ... 132 V
input voltage 2 at AC	176 ... 264 V
supply voltage	
• at 50 Hz	230 V
• at 60 Hz	120 V
line frequency	50 Hz/60 Hz
line frequency	47 ... 63 Hz
wide range input	No
overvoltage overload capability	2.3 × Vin rated, 1.3 ms
buffering time for rated value of the output current in the event of power failure minimum	20 ms
operating condition of the mains buffering	at Vin = 93/187 V
input current	
• at rated input voltage 120 V	1.2 A
• at rated input voltage 230 V	0.67 A
current limitation of inrush current at 25 °C maximum	13 A
duration of inrush current limiting at 25 °C	
• maximum	3 ms
I2t value maximum	0.5 $A^2 \cdot s$
fuse protection type	T 3,15 A/250 V (not accessible)
fuse protection type in the feeder	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

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Technical specifications (continued)

Article number	6EP1332-1SH71
product brand name	SIMATIC
type of current supply	24 V/2.5 A
output	
voltage curve at output	Controlled, isolated DC voltage
product function output voltage controlled	Yes
product function output voltage stabilized	Yes
output voltage at DC rated value	24 V
	24 V
output voltage	
• at output 1 at DC rated value	24 V
output voltage adjustable	No; -
relative overall tolerance of the voltage	3 %
relative control precision of the output voltage	
• on slow fluctuation of input voltage	0.1 %
• on slow fluctuation of ohm loading	0.2 %
residual ripple	
• maximum	150 mV
voltage peak	
• maximum	240 mV
display version for normal operation	Green LED for 24 V OK
behavior of the output voltage when switching on	No overshoot of Vout (soft start)
response delay maximum	6 s; 2 s at 230 V, 6 s at 120 V
voltage increase time of the output voltage	
• typical	10 ms
output current	
• rated value	2.5 A
• rated range	0 ... 2.5 A
	2.5 A
supplied active power typical	60 W
short-term overload current	
• on short-circuiting during the start-up typical	6 A
• at short-circuit during operation typical	6 A
duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
bridging of equipment	Yes
number of parallel-switched equipment resources	2
efficiency	
efficiency in percent	83 %
power loss [W]	
• at rated output voltage for rated value of the output current typical	12 W

Technical specifications (continued)

Article number	6EP1332-1SH71
product brand name	SIMATIC
type of current supply	24 V/2.5 A
closed-loop control	
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.3 %
relative control precision of the output voltage load step of resistive load 50/100/50 % typical	3 %
setting time	
• load step 50 to 100% typical	5 ms
• load step 100 to 50% typical	5 ms
setting time	
• maximum	5 ms
protection and monitoring	
design of the overvoltage protection	< 33 V
property of the output short-circuit proof	Yes
design of short-circuit protection	Constant current characteristic
• typical	2.65 A
enduring short circuit current RMS value	
• typical	2.7 A
safety	
galvanic isolation between input and output	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class I
leakage current	
• maximum	3.5 mA
protection class IP	IP20
EMC	
standard	
• for emitted interference	EN 55022 Class B
• for mains harmonics limitation	not applicable
• for interference immunity	EN 61000-6-2
standards, specifications, approvals	
certificate of suitability	
• CE marking	Yes
• UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950-1, CSA C22.2 No. 60950-1) File E151273
• UKCA marking	Yes
• EAC approval	Yes
• NEC Class 2	Yes; according to UL1310, File E151273
type of certification	
• CB-certificate	Yes
MTBF at 40 °C	1 492 537 h

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Technical specifications (continued)

Article number	6EP1332-1SH71
product brand name	SIMATIC
type of current supply	24 V/2.5 A
standards, specifications, approvals hazardous environments	
certificate of suitability	
• IECEx	Yes; IECEx Ex nA nC IIC T4 Gc
• ATEX	Yes; ATEX (EX) II 3G Ex ec nC IIC T4 Gc
• ULhazloc approval	Yes
• UKEX	Yes
• CCC for hazardous zone according to GB standard	Yes
• FM registration	Yes; Class I, Div. 2, Group ABCD, T4
standards, specifications, approvals marine classification	
shipbuilding approval	Yes
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• French marine classification society (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	334.2 kg
• during manufacturing	5.7 kg
• during operation	328.2 kg
• after end of life	0.21 kg
ambient conditions	
ambient temperature	
• during operation	0 ... 60 °C; with natural convection
• during transport	-40 ... +85 °C
• during storage	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation
connection method	
type of electrical connection	screw terminal
• at input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm²
• at output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm²
• for auxiliary contacts	-

Technical specifications (continued)

Article number	6EP1332-1SH71
product brand name	SIMATIC
type of current supply	24 V/2.5 A
mechanical data	
width × height × depth of the enclosure	70 mm × 100 mm × 75 mm
installation width × mounting height	70 mm × 140 mm
required spacing	
• top	20 mm
• bottom	20 mm
• left	0 mm
• right	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting
• DIN-rail mounting	Yes
• S7 rail mounting	No
• wall mounting	Yes
housing can be lined up	Yes
net weight	0.3 kg
further information internet links	
internet link	
• to website: Industry Mall	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com
additional information	
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



- Stabilized power supply for SIPLUS S7-1200
- In the S7-1200 design
- Input 120/230 V AC, output 24 V DC, 2.5 A (derating: 1.5 A above 60 °C)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

SIPLUS power supply PM 1207		
Article No.	**6AG1 332-1SH71-4AA0**	**6AG1 332-1SH71-7AA0**
Article No. based on	**6EP1 332-1SH71**	
Range of ambient temperature	0 ... +60° C	-40 ... +70° C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical specifications	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.	
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!	
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!	
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see range of ambient temperature 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K	

Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

Selection and ordering data

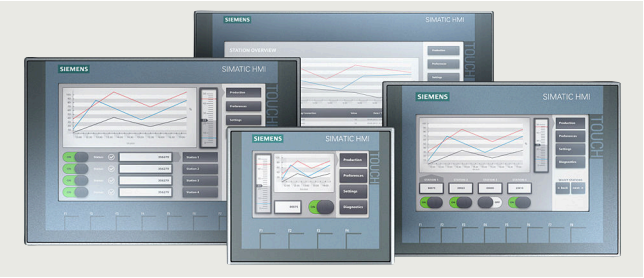
	Article No.
SIPLUS S7-1200 PM 1207 power supply	
(Extended temperature range and exposure to environmental substances)	
Input 120/230 V AC, output 24 V DC, 2.5 A; derating from +55 °C to +70 °C to 1.2 A output current	
Ambient temperature -25 ... +70 °C	**6AG1332-1SH71-7AA0**
Ambient temperature 0 ... +60 °C	**6AG1332-1SH71-4AA0**

Technical specifications

	SIPLUS PM 1207
Article No.	**6AG1332-1SH71-7AA0** **6AG1332-1SH71-4AA0**
Article No. based on	**6EP1332-1SH71**
Input voltage, nominal value	120/230 V AC (auto-switching)
• Range	85 ... 132 V/176 ... 264 V AC
Mains buffering	> 20 ms (at 93/187 V)
Line frequency, nominal	50/60 Hz
• Range	47 ... 63 Hz
Input current, nominal value	1.2/0.67 A
• Inrush current (25 °C)	<13 A
• Recommended circuit-breaker	16 A Charact. B, 10 A Charact. C
Output voltage, nominal value	24 V DC
• Tolerance	± 3%
• Residual ripple	< 150 mVpp
• Adjustment	No
Output current, nominal value	2.5 A (derating: 1.5 A above 60 °C)
Efficiency at nominal values, approx.	83%
Parallel operation	Yes, 2 units
Electronic short-circuit protection	Yes, automatic restart
Radio interference suppression (EN 55022)	Class B
Operating display	Green LED for "24 V o.k."
Supply-harmonics limitation (EN 61000-3-2)	Not applicable
Degree of protection (EN 60529)	IP20
Protection class	Class 1
Electric isolation	SELV acc. to EN 60950 and EN 50178
Ambient temperature	0 ... +60 °C -40 ... +70 °C
Transport and storage temperature	-40 ... +85 °C
Installation	DIN rail EN 60715 35x7.5/15
Dimensions (W x H x D) in mm	70 x 100 x 75
Weight, approx.	0.3 kg
Certifications	CE

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Overview



Basic Panels 2nd Generation

With their fully developed HMI basic functions, SIMATIC HMI Basic Panels 2nd Generation are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or bar code scanner, and supports the simple archiving of data on a USB flash drive as well as the manual backup and restoring of the complete panel.

The integrated Ethernet or RS 485/RS 422 interface (version-specific) enables simple connection to the controller.

More information is available at this link

Selection and ordering data

SIMATIC HMI Basic Panels (2 nd Generation)	
Key and touch devices	
SIMATIC HMI KTP400 Basic Key/touch operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	**6AV2123-2DB03-0AX0**
SIMATIC HMI TP400 Basic Keyless Touch screen operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	**6AV2143-6DB00-0AA0**
SIMATIC HMI KTP700 Basic Key/touch operation; 7" TFT display, 65 536 colors, PROFINET interface	**6AV2123-2GB03-0AX0**
SIMATIC HMI KTP700 Basic DP Key/touch operation; 7" TFT display, 65 536 colors, PROFIBUS interface	**6AV2123-2GA03-0AX0**
SIMATIC HMI TP700 Basic Keyless Touch screen operation; 7" TFT display, 65 536 colors, PROFINET interface	**6AV2143-6GB00-0AA0**
SIMATIC HMI KTP900 Basic Key/touch operation; 9" TFT display, 65 536 colors, PROFINET interface	**6AV2123-2JB03-0AX0**
SIMATIC HMI TP900 Basic Keyless Touch screen operation; 9" TFT display, 65 536 colors, PROFINET interface	**6AV2143-6JB00-0AA0**
SIMATIC HMI KTP1200 Basic Key/touch operation; 12" TFT display, 65 536 colors, PROFINET interface	**6AV2123-2MB03-0AX0**
SIMATIC HMI KTP1200 Basic DP Key/touch operation; 12" TFT display, 65 536 colors, PROFIBUS interface	**6AV2123-2MA03-0AX0**
Documentation	
You can find the Equipment Manual for the Basic Panels on the Internet at:	Link
Accessories	See catalog ST 80 / ST PC

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Overview



SIMATIC HMI Comfort Panels - Standard devices

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- All versions can be used as an OPC UA client or as a server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal engineering framework

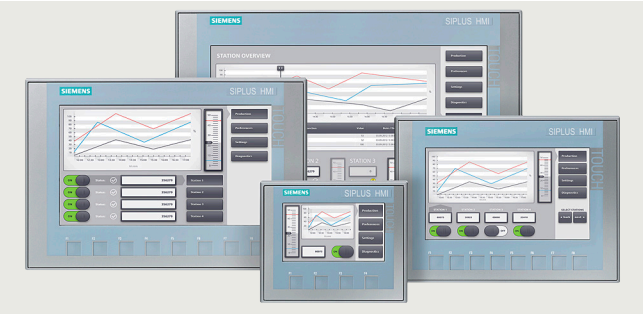
Note:
A 7" and a 15" Comfort Outdoor version are available. These devices have been specially designed for outdoor applications in difficult environments. Best display quality, even under sunlight, UV-resistant fronts and much more.
More information is available at this link

Selection and ordering data

SIMATIC HMI Comfort Panels	
Touch devices	
SIMATIC HMI TP700 Comfort Touch operation; 7" widescreen display	**6AV2124-0GC01-0AX0**
SIMATIC HMI TP900 Comfort Touch operation; 9" widescreen display	**6AV2124-0JC01-0AX0**
SIMATIC HMI TP1200 Comfort Touch operation; 12" widescreen display	**6AV2124-0MC01-0AX0**
SIMATIC HMI TP1500 Comfort Touch operation; 15" widescreen display; Ambient temperature up to 50 °C (up to 55 °C with restriction)	**6AV2124-0QC02-0AX1**
SIMATIC HMI TP1500 Comfort Touch operation; 15" widescreen display; Ambient temperature up to 45 °C	**6AV2124-0QC02-0AX2**
SIMATIC HMI TP1900 Comfort Touch operation; 19" widescreen display	**6AV2124-0UC02-0AX1**
SIMATIC HMI TP2200 Comfort Touch operation; 22" widescreen display	**6AV2124-0XC02-0AX1**
Key devices	
SIMATIC HMI KP700 Comfort Key operation; 7" widescreen display	**6AV2124-1GC01-0AX0**
SIMATIC HMI KP900 Comfort Key operation; 9" widescreen display	**6AV2124-1JC01-0AX0**
SIMATIC HMI KP1200 Comfort Key operation; 12" widescreen display	**6AV2124-1MC01-0AX0**
SIMATIC HMI KP1500 Comfort Key operation; 15" widescreen display; Ambient temperature up to 50 °C (up to 55 °C with restriction)	**6AV2124-1QC02-0AX1**
SIMATIC HMI KP1500 Comfort Key operation; 15" widescreen display; Ambient temperature up to 45 °C	**6AV2124-1QC02-0AX2**
Accessories	See catalog ST 80 / ST PC

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Overview



With their fully developed HMI basic functions, 2nd Generation SIPLUS Basic Panels are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS HMI Basic Panels, Key and Touch	
SIPLUS HMI KTP400 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1123-2DB03-2AX0**
SIPLUS HMI KTP700 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	**6AG1123-2GB03-2AX0**
SIPLUS HMI KTP700 Basic DP For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	**6AG1123-2GA03-2AX0**
SIPLUS HMI KTP900 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	**6AG1123-2JB03-2AX0**
SIPLUS HMI KTP1200 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C	**6AG1123-2MB03-2AX0**
SIPLUS HMI KTP1200 Basic DP For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C	**6AG1123-2MA03-2AX0**
Accessories	See catalog ST 80 / ST PC

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Technical specifications

Article number	6AG1123-2DB03-2AX0 SIPLUS HMI KTP400 BASIC	6AG1123-2GB03-2AX0 SIPLUS HMI KTP700 BASIC	6AG1123-2GA03-2AX0 SIPLUS HMI KTP700 BASIC DP
General information			
Product type designation	KTP400 Basic color PN	KTP700 Basic color PN	KTP700 Basic color DP
Display			
Design of display	TFT widescreen display, LED backlighting	TFT widescreen display, LED backlighting	TFT widescreen display, LED backlighting
Screen diagonal	4.3 in	7 in	7 in
Number of colors	65 536	65 536	65 536
Resolution (pixels)			
• Horizontal image resolution	480 pixel	800 pixel	800 pixel
• Vertical image resolution	272 pixel	480 pixel	480 pixel
Backlighting			
• MTBF backlighting (at 25 °C)	20 000 h	20 000 h	20 000 h
Control elements			
Keyboard			
• Function keys			
- Number of function keys	4	8	8
Touch operation			
• Design as touch screen	Yes; Analog-resistive	Yes; Analog-resistive	Yes; Analog-resistive
Installation type/mounting			
Wall mounting/direct mounting	No	No	
Mounting in portrait format possible	Yes	Yes	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Storage			
Memory available for user data	10 Mbyte	10 Mbyte	10 Mbyte
Type of output			
Acoustics			
• Buzzer	Yes	Yes	Yes
Time of day			
Clock			
• Software clock	Yes	Yes	Yes
• retentive	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks
• synchronizable	Yes	Yes	Yes
Interfaces			
Number of industrial Ethernet interfaces	1	1	0
Number of RS 485 interfaces	0	0	1
Number of USB interfaces	1; Up to 16 GB	1; Up to 16 GB	1; Up to 16 GB
Number of SD card slots	0	0	0
Protocols			
PROFINET	Yes	Yes	No
IRT	No	No	No
PROFIBUS	No	No	Yes
MPI	No	No	Yes
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
Degree and class of protection			
IP (at the front)	IP65	IP65	IP65
IP (rear)	IP20	IP20	IP20
NEMA (front)			
• Enclosure Type 4x at the front	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1123-2DB03-2AX0 SIPLUS HMI KTP400 BASIC	6AG1123-2GB03-2AX0 SIPLUS HMI KTP700 BASIC	6AG1123-2GA03-2AX0 SIPLUS HMI KTP700 BASIC DP
Ambient conditions			
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Languages			
Online languages			
• Number of online/runtime languages	10	10	10

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Technical specifications (continued)

Article number	6AG1123-2DB03-2AX0 SIPLUS HMI KTP400 BASIC	6AG1123-2GB03-2AX0 SIPLUS HMI KTP700 BASIC	6AG1123-2GA03-2AX0 SIPLUS HMI KTP700 BASIC DP
Functionality under WinCC (TIA Portal)			
Applications/options			
• Web browser		Yes	No
• SIMATIC WinCC Sm@rtServer	Yes; Available with WinCC (TIA Portal) V14 or higher	Yes; Available with WinCC (TIA Portal) V14 or higher	No
Number of Visual Basic Scripts	No	No	No
Task planner	Yes	Yes	Yes
• time-controlled	No	No	No
• task-controlled	Yes	Yes	Yes
Message system			
• Bit messages			
- Number of bit messages	1 000	1 000	1 000
• Analog messages			
- Number of analog messages	25	25	25
• Message buffer	Yes		
- Number of entries	256	256	256
- Circulating buffer	Yes	Yes	Yes
- retentive	Yes	Yes	Yes
Recipe management			
• Number of recipes	50	50	50
• Size of internal recipe memory	256 kbyte	256 kbyte	256 kbyte
• Recipe memory expandable	No	No	No
Variables			
• Number of variables per device	800	800	800
• Number of variables per screen	100	100	100
Images			
• Number of configurable images	250	250	250
Archiving			
• Number of archives per device	2; One message and one process value archive	2; One message and one process value archive	2; One message and one process value archive
• Number of entries per archive	10 000	10 000	10 000
• Message archive	Yes	Yes	Yes
• Process value archive	Yes	Yes	Yes
• Archiving methods			
- Sequential archive	Yes	Yes	Yes
- Short-term archive	Yes	Yes	Yes
• Memory location			
- Memory card	No	No	No
- USB memory	Yes	Yes	Yes
- Ethernet	No	No	No
• Data storage format			
- CSV	No	No	No

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Technical specifications (continued)

Article number	6AG1123-2DB03-2AX0 SIPLUS HMI KTP400 BASIC	6AG1123-2GB03-2AX0 SIPLUS HMI KTP700 BASIC	6AG1123-2GA03-2AX0 SIPLUS HMI KTP700 BASIC DP
- TXT	Yes	Yes	Yes
- RDB	No	No	No
Security			
• Number of user groups	50	50	50
• Number of users	50	50	50
• SIMATIC Logon	No	No	No
Transfer (upload/download)			
• MPI/PROFIBUS DP	No	No	Yes
• Ethernet	Yes	Yes	No
Process coupling			
• S7-1200	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes
• WinAC	Yes	Yes	Yes
• SIMOTION	Yes	Yes	Yes
• Allen Bradley (EtherNet/IP)	Yes	Yes	No
• Allen Bradley (DF1)	No	No	Yes
• Mitsubishi (MC TCP/IP)	Yes	Yes	No
• Mitsubishi (FX)	No	No	Yes
• OMRON (FINS TCP)	No	No	No
• OMRON (Host Link)	No	No	Yes
• Modicon (Modbus TCP/IP)	Yes	Yes	No
• Modicon (Modbus RTU)	No	No	Yes
Peripherals/Options			
Printer	No	No	No
SIMATIC HMI MM memory card: Multi Media Card	No	No	No
SIMATIC HMI SD memory card: Secure Digital memory card	No	No	No
USB memory	Yes	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• plastic	Yes	Yes	Yes
• Aluminum	No	No	No
• Stainless steel	No	No	No
Dimensions			
Width of the housing front	140 mm	214 mm	214 mm
Height of housing front	116 mm	158 mm	158 mm
Mounting cutout, width	124 mm	198 mm	198 mm
Mounting cutout, height	100 mm	142 mm	142 mm
mounting depth	34.9 mm	39 mm	39 mm
Weights			
Weight (without packaging)	360 g	780 g	800 g

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Technical specifications (continued)

Article number	6AG1123-2JB03-2AX0 SIPLUS HMI KTP900 BASIC	6AG1123-2MB03-2AX0 SIPLUS HMI KTP1200 BASIC	6AG1123-2MA03-2AX0 SIPLUS HMI KTP1200 BASIC DP
General information			
Product type designation	KTP900 Basic color PN	KTP1200 Basic color PN	KTP1200 Basic color DP
Display			
Design of display	TFT widescreen display, LED backlighting	TFT widescreen display, LED backlighting	TFT widescreen display, LED backlighting
Screen diagonal	9 in	12 in	12 in
Number of colors	65 536	65 536	65 536
Resolution (pixels)			
• Horizontal image resolution	800 pixel	1 280 pixel	1 280 pixel
• Vertical image resolution	480 pixel	800 pixel	800 pixel
Backlighting			
• MTBF backlighting (at 25 °C)	20 000 h	20 000 h	20 000 h
Control elements			
Keyboard			
• Function keys			
- Number of function keys	8	10	10
Touch operation			
• Design as touch screen	Yes; Analog-resistive	Yes; Analog-resistive	Yes; Analog-resistive
Installation type/mounting			
Mounting in portrait format possible	Yes	Yes	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Storage			
Memory available for user data	10 Mbyte	10 Mbyte	10 Mbyte
Type of output			
Acoustics			
• Buzzer	Yes	Yes	Yes
Time of day			
Clock			
• Software clock	Yes	Yes	Yes
• retentive	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks
• synchronizable	Yes	Yes	Yes
Interfaces			
Number of industrial Ethernet interfaces	1	1	0
Number of RS 485 interfaces	0	0	1
Number of USB interfaces	1; Up to 16 GB	1; Up to 16 GB	1; Up to 16 GB
Number of SD card slots	0	0	0
Protocols			
PROFINET	Yes	Yes	No
IRT	No	No	No
PROFIBUS	No	No	Yes
MPI	No	No	Yes
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
Degree and class of protection			
IP (at the front)	IP65	IP65	IP65
IP (rear)	IP20	IP20	IP20
NEMA (front)			
• Enclosure Type 4x at the front	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1123-2JB03-2AX0 SIPLUS HMI KTP900 BASIC	6AG1123-2MB03-2AX0 SIPLUS HMI KTP1200 BASIC	6AG1123-2MA03-2AX0 SIPLUS HMI KTP1200 BASIC DP
Ambient conditions			
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Languages			
Online languages			
• Number of online/runtime languages	10	10	10

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Technical specifications (continued)

Article number	6AG1123-2JB03-2AX0 SIPLUS HMI KTP900 BASIC	6AG1123-2MB03-2AX0 SIPLUS HMI KTP1200 BASIC	6AG1123-2MA03-2AX0 SIPLUS HMI KTP1200 BASIC DP
Functionality under WinCC (TIA Portal)			
Applications/options			
• Web browser	Yes	Yes	No
• SIMATIC WinCC Sm@rtServer	Yes; Available with WinCC (TIA Portal) V14 or higher	Yes; Available with WinCC (TIA Portal) V14 or higher	No
Number of Visual Basic Scripts	No	No	No
Task planner	Yes	Yes	Yes
• time-controlled	No	No	No
• task-controlled	Yes	Yes	Yes
Message system			
• Bit messages			
- Number of bit messages	1 000	1 000	1 000
• Analog messages			
- Number of analog messages	25	25	25
• Message buffer	Yes		
- Number of entries	256	256	256
- Circulating buffer	Yes	Yes	Yes
- retentive	Yes	Yes	Yes
Recipe management			
• Number of recipes	50	50	50
• Size of internal recipe memory	256 kbyte	256 kbyte	256 kbyte
• Recipe memory expandable	No	No	No
Variables			
• Number of variables per device	800	800	800
• Number of variables per screen	100	100	100
Images			
• Number of configurable images	250	250	250
Archiving			
• Number of archives per device	2	2; One message and one process value archive	2
• Number of entries per archive	10 000	10 000	10 000
• Message archive	Yes	Yes	Yes
• Process value archive	Yes	Yes	Yes
• Archiving methods			
- Sequential archive	Yes	Yes	Yes
- Short-term archive	Yes	Yes	Yes
• Memory location			
- Memory card	No	No	No
- USB memory	Yes	Yes	Yes
- Ethernet	No	No	No
• Data storage format			
- CSV	No	No	No

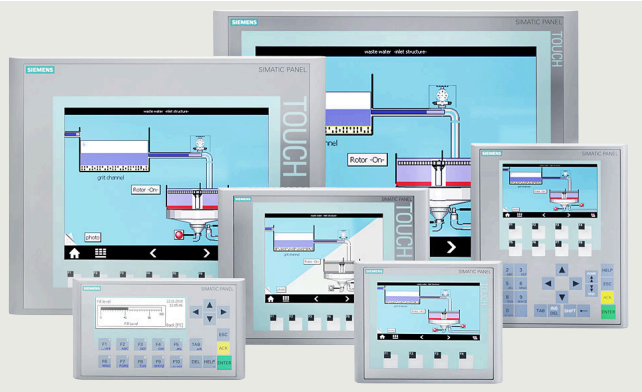
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Technical specifications (continued)

Article number	6AG1123-2JB03-2AX0 SIPLUS HMI KTP900 BASIC	6AG1123-2MB03-2AX0 SIPLUS HMI KTP1200 BASIC	6AG1123-2MA03-2AX0 SIPLUS HMI KTP1200 BASIC DP
- TXT	Yes	Yes	Yes
- RDB	No	No	No
Security			
• Number of user groups	50	50	50
• Number of users	50	50	50
• SIMATIC Logon	No	No	No
Transfer (upload/download)			
• MPI/PROFIBUS DP	No	No	Yes
• Ethernet	Yes	Yes	No
Process coupling			
• S7-1200	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes
• WinAC	Yes	Yes	Yes
• SIMOTION	Yes	Yes	Yes
• Allen Bradley (EtherNet/IP)	Yes	Yes	No
• Allen Bradley (DF1)	No	No	Yes
• Mitsubishi (MC TCP/IP)	Yes	Yes	No
• Mitsubishi (FX)	No	No	Yes
• OMRON (FINS TCP)	No	No	No
• OMRON (Host Link)	No	No	Yes
• Modicon (Modbus TCP/IP)	Yes	Yes	No
• Modicon (Modbus RTU)	No	No	Yes
Peripherals/Options			
Printer	No	No	No
SIMATIC HMI MM memory card: Multi Media Card	No	No	No
SIMATIC HMI SD memory card: Secure Digital memory card	No	No	No
USB memory	Yes	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• plastic	Yes	Yes	Yes
• Aluminum	No	No	No
• Stainless steel	No	No	No
Dimensions			
Width of the housing front	267 mm	330 mm	330 mm
Height of housing front	182 mm	245 mm	245 mm
Mounting cutout, width	251 mm	310 mm	310 mm
Mounting cutout, height	166 mm	221 mm	221 mm
mounting depth	39.4 mm	54.9 mm	54.9 mm
Weights			
Weight (without packaging)	1 130 g	1 710 g	1 710 g

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Overview



- Ideal entry-level series of 3.8" to 15" for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS485/422
- Faster commissioning thanks to integrated diagnostics viewer and IP setting for SIMATIC S7-1200 and S7-1500 PLCs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS HMI Basic Panels	
SIPLUS HMI KP300 Basic mono PN with conformal coating, ambient temperature -25... +60°C, based on 6AV6647-0AH11-3AX1	**6AG1647-0AH11-2AX1**
Accessories	See catalog ST 80 / ST PC

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Technical specifications

Article number	6AG1647-0AH11-2AX1 SIPLUS HMI KP300 Basic mono PN
General information	
Product type designation	KP300 Basic mono PN
Display	
Design of display	FSTN
Screen diagonal	3.6 in
Number of colors	4; backlit display only (white, red, green, yellow)
Resolution (pixels)	
• Horizontal image resolution	240 pixel
• Vertical image resolution	80 pixel
Backlighting	
• MTBF backlighting (at 25 °C)	50 000 h
Control elements	
Keyboard	
• Function keys	
- Number of function keys	10
Touch operation	
• Design as touch screen	No; without
Installation type/mounting	
Rack mounting	No
Wall mounting/direct mounting	No
Mounting in portrait format possible	No
Supply voltage	
Rated value (DC)	24 V
Storage	
Memory available for user data	1 Mbyte
Type of output	
Acoustics	
• Buzzer	No
Time of day	
Clock	
• Software clock	Yes
• retentive	No
• synchronizable	Yes
Interfaces	
Number of industrial Ethernet interfaces	1
Number of RS 485 interfaces	0
Number of USB interfaces	0
Number of SD card slots	0
Protocols	
PROFINET	Yes
IRT	No
PROFIBUS	No
MPI	No
Redundancy mode	
- Media redundancy	
- MRP	No
Degree and class of protection	
IP (at the front)	IP65
IP (rear)	IP20
NEMA (front)	
• Enclosure Type 4x at the front	Yes

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Technical specifications (continued)

Article number	6AG1647-0AH11-2AX1 SIPLUS HMI KP300 Basic mono PN
Ambient conditions	
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning when condensation present), horizontal at vertical mounting position
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Languages	
Online languages	
• Number of online/runtime languages	5

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Technical specifications (continued)

Article number	6AG1647-0AH11-2AX1 SIPLUS HMI KP300 Basic mono PN
Functionality under WinCC (TIA Portal)	
Applications/options	none
• Web browser	No
• SIMATIC WinCC Sm@rtServer	No
Task planner	
• time-controlled	No
• task-controlled	Yes
Message system	
• Bit messages	Yes
- Number of bit messages	200
• Analog messages	Yes
- Number of analog messages	15
• Message buffer	
- Number of entries	256
- Circulating buffer	Yes
- retentive	Yes
Recipe management	
• Number of recipes	5
• Size of internal recipe memory	40 kbyte
• Recipe memory expandable	No
Variables	
• Number of variables per device	250
• Number of variables per screen	30
Images	
• Number of configurable images	50
Archiving	
• Number of archives per device	0
Security	
• Number of user groups	50
• Number of users	50
• SIMATIC Logon	No
Transfer (upload/download)	
• MPI/PROFIBUS DP	No
• Ethernet	Yes
Process coupling	
• S7-1200	Yes
• S7-1500	Yes
• S7-200	Yes
• S7-300/400	Yes
• LOGO!	Yes
• WinAC	Yes
• SIMOTION	No
• Allen Bradley (EtherNet/IP)	Yes
• Allen Bradley (DF1)	No
• Mitsubishi (MC TCP/IP)	Yes
• Mitsubishi (FX)	No
• OMRON (FINS TCP)	No
• OMRON (Host Link)	No
• Modicon (Modbus TCP/IP)	Yes
• Modicon (Modbus RTU)	No
Peripherals/Options	
Printer	No
SIMATIC HMI MM memory card: Multi Media Card	No
SIMATIC HMI SD memory card: Secure Digital memory card	No
USB memory	No

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Technical specifications (continued)

Article number	6AG1647-0AH11-2AX1 SIPLUS HMI KP300 Basic mono PN
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
• Aluminum	No
• Stainless steel	No
Dimensions	
Width of the housing front	165 mm
Height of housing front	97 mm
Mounting cutout, width	149 mm
Mounting cutout, height	82 mm
mounting depth	30 mm
Weights	
Weight (without packaging)	0.25 kg

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Overview



- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Easy project transfer via standard cable (standard Ethernet cable, standard USB cable)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2x PROFINET with integrated switch for 7" models or larger; plus 1 additional PROFINET with Gigabit support for 15" models or larger
- All variants can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- Key-operated devices with stamped keys for optimum tactile feedback
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS HMI Comfort Panels, Touch	
SIPLUS HMI TP700 Comfort	6AG1124-0GC01-4AX0
SIPLUS HMI TP900 Comfort	6AG1124-0JC01-4AX0
SIPLUS HMI TP1200 Comfort	6AG1124-0MC01-4AX0
SIPLUS HMI TP1500 Comfort	6AG1124-0QC02-4AX1
SIPLUS HMI TP1900 Comfort	6AG1124-0UC02-4AX1
SIPLUS HMI TP2200 Comfort	6AG1124-0XC02-4AX1
SIPLUS HMI Comfort Panels, Keys	
SIPLUS HMI KP700 Comfort	6AG1124-1GC01-4AX0
SIPLUS HMI KP900 Comfort	6AG1124-1JC01-4AX0
SIPLUS HMI KP1200 Comfort	6AG1124-1MC01-4AX0
SIPLUS HMI KP1500 Comfort	6AG1124-1QC02-4AX1
Accessories	See catalog ST 80 / ST PC

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Technical specifications

Article number	6AG1124-1GC01-4AX0 SIPLUS HMI KP700 COMFORT	6AG1124-1JC01-4AX0 SIPLUS HMI KP900 COMFORT	6AG1124-1MC01-4AX0 SIPLUS HMI KP1200 COMFORT	6AG1124-1QC02-4AX1 SIPLUS HMI KP1500 Comfort
General information				
Product type designation	KP700 Comfort	KP900 Comfort	KP1200 Comfort	KP1500 Comfort
Display				
Design of display	TFT	TFT	TFT	TFT
Screen diagonal	7 in	9 in	12.1 in	15.4 in
Number of colors	16 777 216	16 777 216	16 777 216	16 777 216
Resolution (pixels)				
• Horizontal image resolution	800 pixel	800 pixel	1 280 pixel	1 280 pixel
• Vertical image resolution	480 pixel	480 pixel	800 pixel	800 pixel
Backlighting				
• MTBF backlighting (at 25 °C)	80 000 h	80 000 h	80 000 h	80 000 h
Control elements				
Keyboard				
• Function keys				
- Number of function keys	24	26	34	36
Touch operation				
• Design as touch screen	No; without	No; without	No; without	No; without
Installation type/mounting				
Wall mounting/direct mounting	No	No	No	
Mounting in portrait format possible	No	No	No	No
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Storage				
Memory available for user data	12 Mbyte	12 Mbyte	12 Mbyte	24 Mbyte
Type of output				
Acoustics				
• Speaker	Yes	Yes	Yes	Yes
Time of day				
Clock				
• Hardware clock (real-time)	Yes	Yes	Yes	Yes
• retentive	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks
• synchronizable	Yes	Yes	Yes	Yes
Interfaces				
Number of industrial Ethernet interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)	2; 2 ports (switch) + independent port
Number of RS 485 interfaces	1; RS 422 / 485 combined	1; RS 422 / 485 combined	1; RS 422 / 485 combined	1; RS 422 / 485 combined
Number of USB interfaces	2; USB 2.0	2; USB 2.0	2; USB 2.0	2; USB 2.0
• USB Mini B	1; 5-pole	1; 5-pole	1; 5-pole	
Number of SD card slots	2	2	2	2
Industrial Ethernet				
• Number of ports of the integrated switch	2	2	2	2
Protocols				
PROFINET	Yes	Yes	Yes	Yes
IRT	Yes; As of WinCC V12	Yes; As of WinCC V12	Yes; As of WinCC V12	Yes
PROFIBUS	Yes	Yes	Yes	Yes
MPI	Yes	Yes	Yes	Yes
Redundancy mode				
- Media redundancy				
- MRP	Yes; As of WinCC V12	Yes; As of WinCC V12	Yes; As of WinCC V12	Yes
Degree and class of protection				
IP (at the front)	IP65	IP65	IP65	IP65
IP (rear)	IP20	IP20	IP20	IP20
NEMA (front)				
• Enclosure Type 4x at the front	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1124-1GC01-4AX0 SIPLUS HMI KP700 COMFORT	6AG1124-1JC01-4AX0 SIPLUS HMI KP900 COMFORT	6AG1124-1MC01-4AX0 SIPLUS HMI KP1200 COMFORT	6AG1124-1QC02-4AX1 SIPLUS HMI KP1500 Comfort
Ambient conditions				
Suited for indoor use				Yes
Suited for outdoor use				No
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				

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Technical specifications (continued)

Article number	6AG1124-1GC01-4AX0	6AG1124-1JC01-4AX0	6AG1124-1MC01-4AX0	6AG1124-1QC02-4AX1
	SIPLUS HMI KP700 COMFORT	SIPLUS HMI KP900 COMFORT	SIPLUS HMI KP1200 COMFORT	SIPLUS HMI KP1500 Comfort
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Languages				
Online languages				
• Number of online/runtime languages	32	32	32	32
Functionality under WinCC (TIA Portal)				
Applications/options				
• Web browser	Yes	Yes	Yes	Yes
• Pocket Word	Yes	Yes	Yes	Yes
• Pocket Excel	Yes	Yes	Yes	Yes
• PDF Viewer	Yes	Yes	Yes	Yes
• Media Player	Yes	Yes	Yes	Yes
• SIMATIC WinCC Sm@rtServer	Yes	Yes	Yes	Yes
• SIMATIC WinCC Audit	Yes	Yes	Yes	Yes
Number of Visual Basic Scripts	Yes	Yes	Yes	Yes
Task planner				
• time-controlled	Yes	Yes	Yes	Yes
• task-controlled	Yes	Yes	Yes	Yes
Message system				
• Bit messages	Yes		Yes	
- Number of bit messages	4 000	4 000	4 000	6 000
• Analog messages	Yes		Yes	
- Number of analog messages	200	200	200	200
• Message buffer				
- Number of entries	1 024	1 024	1 024	1 024

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Technical specifications (continued)

Article number	6AG1124-1GC01-4AX0 SIPLUS HMI KP700 COMFORT	6AG1124-1JC01-4AX0 SIPLUS HMI KP900 COMFORT	6AG1124-1MC01-4AX0 SIPLUS HMI KP1200 COMFORT	6AG1124-1QC02-4AX1 SIPLUS HMI KP1500 Comfort
- Circulating buffer	Yes	Yes	Yes	Yes
- retentive	Yes	Yes	Yes	Yes
Recipe management				
• Number of recipes	300	300	300	500
• Size of internal recipe memory	2 Mbyte	2 Mbyte	2 Mbyte	4 Mbyte
• Recipe memory expandable	Yes	Yes	Yes	Yes
Variables				
• Number of variables per device	2 048	2 048	2 048	4 096
• Number of variables per screen	400	400	400	400
Images				
• Number of configurable images	500	500	500	750
Archiving				
• Number of archives per device	50	50	50	50
Security				
• Number of user groups	50	50	50	50
• Number of users	50	50	50	50
• SIMATIC Logon	Yes	Yes	Yes	Yes
Logging through printer				
• Alarms	Yes	Yes	Yes	Yes
• Report (shift log)	Yes	Yes	Yes	Yes
• Hardcopy	Yes	Yes	Yes	Yes
• Electronic print to file	Yes; PDF, HTML	Yes; PDF, HTML	Yes; PDF, HTML	Yes; PDF, HTML
Transfer (upload/download)				
• MPI/PROFIBUS DP	Yes	Yes	Yes	Yes
• Ethernet	Yes	Yes	Yes	Yes
Process coupling				
• S7-1200	Yes	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes	Yes
• WinAC	Yes	Yes	Yes	Yes
• SIMOTION	Yes	Yes	Yes	Yes
• Allen Bradley (EtherNet/IP)	Yes	Yes	Yes	Yes
• Allen Bradley (DF1)	Yes	Yes	Yes	Yes
• Mitsubishi (MC TCP/IP)	Yes	Yes	Yes	Yes
• Mitsubishi (FX)	Yes	Yes	Yes	Yes
• OMRON (FINS TCP)	No	No	No	No
• OMRON (Host Link)	Yes	Yes	Yes	Yes
• Modicon (Modbus TCP/IP)	Yes	Yes	Yes	Yes
• Modicon (Modbus RTU)	Yes	Yes	Yes	Yes
• OPC UA Client	Yes	Yes	Yes	Yes
• OPC UA Server	Yes	Yes	Yes	Yes
Peripherals/Options				
Printer	Yes	Yes	Yes	Yes
SIMATIC HMI MM memory card: Multi Media Card	Yes; Up to 128 MB	Yes; Up to 128 MB	Yes; Up to 128 MB	Yes; Up to 128 MB
SIMATIC HMI SD memory card: Secure Digital memory card	Yes; Up to 2 GB	Yes; Up to 2 GB	Yes; Up to 2 GB	Yes; Up to 2 GB
USB memory	Yes	Yes	Yes	Yes
Network camera	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1124-1GC01-4AX0 SIPLUS HMI KP700 COMFORT	6AG1124-1JC01-4AX0 SIPLUS HMI KP900 COMFORT	6AG1124-1MC01-4AX0 SIPLUS HMI KP1200 COMFORT	6AG1124-1QC02-4AX1 SIPLUS HMI KP1500 Comfort
Mechanics/material				
Enclosure material (front)				
• plastic	No	No	No	No
• Aluminum	Yes	Yes	Yes	Yes
• Stainless steel	No	No	No	No
Dimensions				
Width of the housing front	308 mm	361.2 mm	454 mm	483 mm
Height of housing front	204 mm	230 mm	289 mm	310 mm
Mounting cutout, width	282 mm	338 mm	434 mm	450 mm
Mounting cutout, height	178 mm	206 mm	269 mm	291 mm
mounting depth	63 mm	63 mm	64.6 mm	75 mm
Weights				
Weight (without packaging)	2.2 kg	2.7 kg	4.4 kg	4.7 kg

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Overview



Note

The CM CANopen module is not a Siemens product, but a product from HMS Industrial Networks and can only be obtained from HMS via this link.

All information about CM CANopen for SIMATIC S7-1200 is provided by HMS Industrial Networks AB, Stationsgatan 37, 302 45 Halmstad, Sweden, info@hms.se.

The following description contains information on supplementary products that are manufactured and marketed, not by Siemens, but by third-parties outside the Siemens group ("external companies"). These external companies organize the manufacture, sale and delivery of their products independently. Their own terms and conditions of business and delivery apply.

Responsibility for these supplementary products and for the associated information presented here rests exclusively with the respective external company. Unless compulsory by law, Siemens assumes no liability and makes no guarantee for supplemental products of external companies. Please refer also to the note on "Exemption from liability/Use of hyperlinks" (see "More information").

Overview

An interface module is available for operating the SIMATIC S7-1200 on CANopen. It can be used together with system and IO components of the S7-1200 automation system.

CiA and CANopen are registered Community Trademarks of CAN in Automation e.V.

Application

CANopen is a widely used industrial bus system and can be used for a variety of different applications. The module allows simple and cost-effective connection of CANopen applications to SIMATIC.

- Control of hydraulic valves/axes in vehicles
- Control of motors in packaging machines or conveyors
- Control of drives in mobile machines (AGV/AMR)
- Capturing of angular encoder positions in wind turbines
- Capturing of control devices on machines, e.g. joysticks
- Capturing the measured data of path encoders, inclinometers or angular encoders, e.g. for tower cranes and gantry cranes

The CM CANopen module has the following properties:

- Interface module for CANopen (master/device) for SIMATIC S7-1200
- Connection of up to 16 CANopen device nodes in the master mode
- 256 bytes of input data and 256 bytes of output data per module
- Connection of up to 3 modules per CPU
- 3 LEDs for module, network and I/O status diagnostics
- Possible integration of the module into the hardware catalog of the TIA Portal configuration suite
- Supports Transparent CAN 2.0A for processing customer-specific protocols
- CANopen implementation according to communication profiles CiA 301 Rev. 4.2 and CiA 302 Rev. 4.1 (master)

More information

The CANopen bus can be configured via any commercially available CANopen configuration tool. HMS Industrial Networks also supplies suitable "CM CANopen Configuration Studio" software with the product. The configuration is saved directly on the module by means of a USB connection. Routing via PROFIBUS/PROFINET is not possible.

Preprogrammed function blocks are available for easier PLC programming in the TIA Portal.

For more information, please contact HMS Industrial Networks under this link.

Ordering and Support

Please note that ordering and support for the module are exclusively carried out via HMS Industrial Networks. Please contact HMS Industrial Networks directly should you have any questions concerning this module. The relevant contact details can be found under this link.

Exemption from liability/Use of hyperlinks

Siemens has prepared this description with great care. It is not possible, however, for Siemens to verify that the data supplied by external companies is complete, correct or up to date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the product for the user per se.

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4/3	S7-1200 G2
4/4	**Central processing units**
4/4	Standard CPUs
4/4	CPU 1212C
4/10	CPU 1214C
4/16	SIPLUS standard CPUs
4/17	SIPLUS CPU 1214C
4/23	Fail-safe CPUs
4/32	**I/O modules**
4/32	Digital modules
4/32	SM 1221 digital input modules
4/34	SB 1221 digital input modules
4/37	SM 1222 digital output modules
4/40	SB 1222 digital output modules
4/43	SM 1223 digital input/output modules
4/47	SB 1223 digital input/output modules
4/50	SIPLUS digital modules
4/50	SIPLUS SM 1221 digital input modules
4/53	SIPLUS SM 1222 digital output modules
4/56	SIPLUS SM 1223 digital input/output modules
4/60	Analog modules
4/60	SM 1231 analog input modules
4/63	SB 1231 analog input modules
4/66	SM 1232 analog output modules
4/69	SB 1232 analog output modules
4/72	SM 1233 analog input/output modules
4/75	SB 1233 analog input/output modules
4/78	SM 1231 AI 8xTC thermocouple module
4/81	SB 1231 AI 4xTC thermocouple signal board
4/84	SM 1231 AI 4xRTD RTD signal module
4/87	SB 1231 AI 2xRTD RTD signal board
4/90	SIPLUS analog modules
4/90	SIPLUS SM 1231 analog input modules
4/94	SIPLUS SM 1232 analog output modules
4/97	SIPLUS SM 1233 analog input/output modules
4/101	Special modules
4/101	SIM 1274 simulator
4/102	BB 1297 battery board
4/103	Communication
4/103	CM 1241 communications module
4/105	CB 1241 RS485 communication board
4/108	CP 1243-1 for S7-1200 G2
4/110	SIPLUS communication
4/110	SIPLUS CM 1241 communications modules
4/112	Connection system
4/112	System cabling for SIMATIC S7-1500 IO (25 mm), ET 200SP, S7-1200 and LOGO!

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4/113	Universal connecting cable
4/114	Connection modules
4/115	Fail-safe I/O modules
4/115	SM 1226 fail-safe digital input/output modules
4/118	**Power supplies**
4/118	1-phase, 24 V DC (for S7-1200 G2)

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Overview



SIMATIC S7-1200 G2 Controllers are the successor generation to the S7-1200 and the right choice for compact automation solutions with integrated I/Os, communication and technology functions for automation tasks in the low to medium performance range. They are available in standard and fail-safe versions.

The scalable SIMATIC S7-1200 G2 Controllers feature integrated inputs and outputs as well as communication options, and allow modular expansion. Digital and analog input and output modules as well as different communications and special modules enable flexible adaptation to the relevant automation task.

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Overview



- Controller for getting started with S7-1200 G2
- Expandable by:
  - 1 extension board (SB, CB, or BB)
  - 6 extension modules (SM, CM, or CP)

Selection and ordering data

CPU 1212C	
SIMATIC S7-1200 G2, compact CPU 1212C DC/DC/DC Power supply: 20.4-28.8 V DC; onboard I/O: 8x DI 24 V DC; 6 x DO 24 V DC; memory: program 150 KB, data 500 KB, retentivity 20 KB	**6ES7212-1AG50-0XB0**
SIMATIC S7-1200 G2, compact CPU 1212C AC/DC/RLY Power supply: 85-264 V AC at 47-63 Hz; onboard I/O: 8 x DI 24 V DC; 6 DO relays 2 A; memory: program 150 KB, data 500 KB, retentivity 20 KB	**6ES7212-1BG50-0XB0**
SIMATIC S7-1200 G2, compact CPU 1212C DC/DC/RLY Power supply: 20.4-28.8 V DC; onboard I/O: 8x DI 24 V DC; 6 DO relays 2 A; memory: program 150 KB, data 500 KB, retentivity 20 KB	**6ES7212-1HG50-0XB0**
Accessories	
SB 1221 signal board	
SIMATIC S7-1200 G2, SB 1221 digital input module 8 DI 100 kHz; inputs: 8 x DI 24 V DC sink/source, 100 kHz	**6ES7221-3BF50-0XB0**
SB 1222 signal board	
SIMATIC S7-1200 G2, SB 1222 digital output module 8 DO 100 kHz; outputs: 8 x DQ 24 V DC 0.1 A sinking/sourcing transistor, 100 kHz	**6ES7222-5BF50-0XB0**
SB 1223 signal board	
SIMATIC S7-1200 G2, SB 1223 digital I/O module 4 DI/4 DO 200 kHz; inputs: 4 x DI 5 V DC, 200 kHz; outputs: 4 x DQ 5 V DC 0.1 A, sinking/sourcing transistor, 200 kHz	**6ES7223-7AF50-0XB0**
SIMATIC S7-1200 G2, SB 1223 digital I/O module 4 DI/4 DO 100 kHz; inputs: 4 x DI 24 V DC sink/source, 100 kHz; outputs: 4 x DQ 24 V DC 0.1 A sinking/sourcing transistor, 100 kHz	**6ES7223-7BF50-0XB0**
SB 1231 signal board	
SIMATIC S7-1200 G2, SB 1231 analog input module 4 AI; inputs: 4 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA)	**6ES7231-4HD50-0XB0**
SB 1232 signal board	
SIMATIC S7-1200 G2, SB 1232 analog output module 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HD50-0XB0**
SB 1233 signal board	
SIMATIC S7-1200 G2, SB 1233 analog I/O module 2 AI/2 AO, inputs: 2 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA), outputs: 2 x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6ES7233-4HD50-0XB0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**

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Selection and ordering data (continued)

STEP 7 Professional / Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-0AA25-0YA5**
SIMATIC STEP 7 Basic V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7212-1AG50-0XB0 CPU 1212C ,DC/DC/DC, 8DI/6DQ	6ES7212-1BG50-0XB0 CPU 1212C, AC/DC/RLY, 8DI/6DO	6ES7212-1HG50-0XB0 CPU 1212C ,DC/DC/RLY, 8DI/6DO
General information			
Product type designation	CPU 1212C DC/DC/DC	CPU 1212C AC/DC/relay	CPU 1212C DC/DC/Relay
Engineering with			
• Programming package	STEP 7 V21 or higher	STEP 7 V21 or higher	STEP 7 V21 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes		Yes
Rated value (AC)			
• 120 V AC		Yes	
• 230 V AC		Yes	
Storage			
Work memory			
• integrated	650 kbyte	650 kbyte	650 kbyte
• integrated (for program)	150 kbyte	150 kbyte	150 kbyte
• integrated (for data)	500 kbyte	500 kbyte	500 kbyte
Load memory			
• Integrated	8 Mbyte	8 Mbyte	8 Mbyte
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte; with SIMATIC memory card	32 Gbyte; with SIMATIC memory card	32 Gbyte; with SIMATIC memory card
CPU processing times			
for bit operations, typ.	37 ns; / instruction	37 ns; / instruction	37 ns; / instruction
for word operations, typ.	30 ns; / instruction	30 ns; / instruction	30 ns; / instruction
for floating point arithmetic, typ.	74 ns; / instruction	74 ns; / instruction	74 ns; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Address area			
I/O address area			
• Inputs	1 kbyte; All inputs are in the process image	1 kbyte; All inputs are in the process image	1 kbyte; All inputs are in the process image
• Outputs	1 kbyte; All outputs are in the process image	1 kbyte; All outputs are in the process image	1 kbyte; All outputs are in the process image
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	8; Integrated	8; Integrated	8; Integrated
• of which inputs usable for technological functions	8; HSC (High Speed Counting)	8; HSC (High Speed Counting)	8; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	6; 20 kHz or 100 kHz	6; Relays	6; Relays
• of which high-speed outputs	4; 100 kHz (Qa.0 - Qa.3)		
Analog inputs			
Number of analog inputs	0	0	0
Analog outputs			
Number of analog outputs	0	0	0

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Technical specifications (continued)

Article number	6ES7212-1AG50-0XB0 CPU 1212C ,DC/DC/DC, 8DI/6DQ	6ES7212-1BG50-0XB0 CPU 1212C, AC/DC/RLY, 8DI/6DO	6ES7212-1HG50-0XB0 CPU 1212C ,DC/DC/RLY, 8DI/6DO
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
- Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	Yes	Yes	Yes
- IRT	Yes	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	31	31	31
- Of which IO devices with IRT, max.	31	31	31
- Number of connectable IO Devices for RT, max.	31	31	31
- of which in line, max.	31	31	31
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	Yes	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7212-1AG50-0XB0 CPU 1212C ,DC/DC/DC, 8DI/6DQ	6ES7212-1BG50-0XB0 CPU 1212C, AC/DC/RLY, 8DI/6DO	6ES7212-1HG50-0XB0 CPU 1212C ,DC/DC/RLY, 8DI/6DO
Protocols			
Number of connections			
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode			
- Media redundancy			
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	Yes	Yes	Yes
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Number of stations in the ring, max.	50	50	50
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max
Supported technology objects			
Motion Control	Yes	Yes	Yes
• Number of available Motion Control resources for technology objects	800	800	800
• Required Motion Control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
• Number of available Extended Motion Control resources for technology objects	40	40	40
• Required Extended Motion Control resources			
- per cam (1 000 points and 50 segments)	2	2	2
- for each set of kinematics	30	30	30
• kinematics functions			
- kinematics with up to 4 interpolating axes	Yes	Yes	Yes
- kinematics with 5 or more interpolating axes	No	No	No
- user-defined kinematics	No	No	No
- SIMATIC Safe Kinematics	No	No	No
Security			
PROFINET Security Class	1	1	1
signed firmware update	Yes	Yes	Yes
Secure Boot	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7212-1AG50-0XB0 CPU 1212C ,DC/DC/DC, 8DI/6DQ	6ES7212-1BG50-0XB0 CPU 1212C, AC/DC/RLY, 8DI/6DO	6ES7212-1HG50-0XB0 CPU 1212C ,DC/DC/RLY, 8DI/6DO
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	40 °C; at max. voltages and max. specifications	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	No	No	No
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide and centralized	Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users	100	100	100
Dimensions			
Width	70 mm	70 mm	70 mm
Height	125 mm	125 mm	125 mm
Depth	100 mm	100 mm	100 mm
Weights			
Weight, approx.	319 g	373 g	333 g

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Overview



- Controller for intro to S7 with flexible expansion options
- Expandable by:
  - 2 extension boards (SB, CB, or BB)
  - 10 extension modules (SM, CM, or CP)

Selection and ordering data

CPU 1214C	
SIMATIC S7-1200 G2, compact CPU 1214C DC/DC/DC 20.4-28.8 V DC; onboard I/O: 14 x DI 24 V DC; 10 DO 24 V DC; memory: program 250 KB, data 750 KB, retentivity 20 KB	**6ES7214-1AH50-0XB0**
SIMATIC S7-1200 G2, compact CPU 1214C AC/DC/RLY Power supply: 85-264 V AC at 47-63 Hz; onboard I/O: 14 x DI 24 V DC; 10 DO relay 2 A; memory: program 250 KB, data 750 KB, retentivity 20 KB	**6ES7214-1BH50-0XB0**
SIMATIC S7-1200 G2, compact CPU 1214C DC/DC/RLY Power supply: 20.4-28.8 V DC; onboard I/O: 14 x DI 24 V DC; 10 DO relay 2 A; memory: program 250 KB, data 750 KB, retentivity 20 KB	**6ES7214-1HH50-0XB0**
Accessories	
SB 1221 signal board	
SIMATIC S7-1200 G2, SB 1221 digital input module 8 DI 100 kHz; inputs: 8 x DI 24 V DC sink/source, 100 kHz	**6ES7221-3BF50-0XB0**
SB 1222 signal board	
SIMATIC S7-1200 G2, SB 1222 digital output module 8 DO 100 kHz; outputs: 8 x DQ 24 V DC 0.1 A sinking/sourcing transistor, 100 kHz	**6ES7222-5BF50-0XB0**
SB 1223 signal board	
SIMATIC S7-1200 G2, SB 1223 digital I/O module 4 DI/4 DO 200 kHz; inputs: 4 x DI 5 V DC, 200 kHz; outputs: 4 x DQ 5 V DC 0.1 A, sinking/sourcing transistor, 200 kHz	**6ES7223-7AF50-0XB0**
SIMATIC S7-1200 G2, SB 1223 digital I/O module 4 DI/4 DO 100 kHz; inputs: 4 x DI 24 V DC sink/source, 100 kHz; outputs: 4 x DQ 24 V DC 0.1 A sinking/sourcing transistor, 100 kHz	**6ES7223-7BF50-0XB0**
SB 1231 signal board	
SIMATIC S7-1200 G2, SB 1231 analog input module 4 AI; inputs: 4 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA)	**6ES7231-4HD50-0XB0**
SB 1232 signal board	
SIMATIC S7-1200 G2, SB 1232 analog output module 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HD50-0XB0**
SB 1233 signal board	
SIMATIC S7-1200 G2, SB 1233 analog I/O module 2 AI/2 AO, inputs: 2 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA), outputs: 2 x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6ES7233-4HD50-0XB0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**

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Selection and ordering data (continued)

STEP 7 Professional / Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-0AA25-0YA5**
SIMATIC STEP 7 Basic V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

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Technical specifications

Article number	6ES7214-1AH50-0XB0 CPU 1214C, DC/DC/DC, 14DI/10DO	6ES7214-1BH50-0XB0 CPU 1214C, AC/DC/RLY, 14DI/10DO	6ES7214-1HH50-0XB0 CPU 1214C, DC/DC/RLY, 14DI/10DO
General information			
Product type designation	CPU 1214C DC/DC/DC	CPU 1214C AC/DC/Relay	CPU 1214C DC/DC/Relay
Engineering with			
• Programming package	STEP 7 V21 or higher	STEP 7 V21 or higher	STEP 7 V21 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes		Yes
Rated value (AC)			
• 120 V AC		Yes	
• 230 V AC		Yes	
Storage			
Work memory			
• integrated	1 000 kbyte	1 000 kbyte	1 000 kbyte
• integrated (for program)	250 kbyte	250 kbyte	250 kbyte
• integrated (for data)	750 kbyte	750 kbyte	750 kbyte
Load memory			
• Integrated	8 Mbyte	8 Mbyte	8 Mbyte
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte; with SIMATIC memory card	32 Gbyte; with SIMATIC memory card	32 Gbyte; with SIMATIC memory card
CPU processing times			
for bit operations, typ.	37 ns; / instruction	37 ns; / instruction	37 ns; / instruction
for word operations, typ.	30 ns; / instruction	30 ns; / instruction	30 ns; / instruction
for floating point arithmetic, typ.	74 ns; / instruction	74 ns; / instruction	74 ns; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Address area			
I/O address area			
• Inputs	1 kbyte; All inputs are in the process image	1 kbyte; All inputs are in the process image	1 kbyte; All inputs are in the process image
• Outputs	1 kbyte; All outputs are in the process image	1 kbyte; All outputs are in the process image	1 kbyte; All outputs are in the process image
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	8; HSC (High Speed Counting)	8; HSC (High Speed Counting)	8; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; 20 kHz or 100 kHz	10; Relays	10; Relays
• of which high-speed outputs	4; 100 kHz (Qa.0 - Qa.3)		
Analog inputs			
Number of analog inputs	0	0	0
Analog outputs			
Number of analog outputs	0	0	0

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Technical specifications (continued)

Article number	6ES7214-1AH50-0XB0 CPU 1214C, DC/DC/DC, 14DI/10DO	6ES7214-1BH50-0XB0 CPU 1214C, AC/DC/RLY, 14DI/10DO	6ES7214-1HH50-0XB0 CPU 1214C, DC/DC/RLY, 14DI/10DO
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
- Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	Yes	Yes	Yes
- IRT	Yes	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	31	31	31
- Of which IO devices with IRT, max.	31	31	31
- Number of connectable IO Devices for RT, max.	31	31	31
- of which in line, max.	31	31	31
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	Yes	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No	No
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
- Asset management record	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7214-1AH50-0XB0 CPU 1214C, DC/DC/DC, 14DI/10DO	6ES7214-1BH50-0XB0 CPU 1214C, AC/DC/RLY, 14DI/10DO	6ES7214-1HH50-0XB0 CPU 1214C, DC/DC/RLY, 14DI/10DO
Protocols			
Number of connections			
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode			
- Media redundancy			
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	Yes	Yes	Yes
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- Number of stations in the ring, max.	50	50	50
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max
Supported technology objects			
Motion Control	Yes	Yes	Yes
• Number of available Motion Control resources for technology objects	800	800	800
• Required Motion Control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
• Number of available Extended Motion Control resources for technology objects	40	40	40
• Required Extended Motion Control resources			
- per cam (1 000 points and 50 segments)	2	2	2
- for each set of kinematics	30	30	30
• kinematics functions			
- kinematics with up to 4 interpolating axes	Yes	Yes	Yes
- kinematics with 5 or more interpolating axes	No	No	No
- user-defined kinematics	No	No	No
- SIMATIC Safe Kinematics	No	No	No
Security			
PROFINET Security Class	1	1	1
signed firmware update	Yes	Yes	Yes
Secure Boot	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7214-1AH50-0XB0 CPU 1214C, DC/DC/DC, 14DI/10DO	6ES7214-1BH50-0XB0 CPU 1214C, AC/DC/RLY, 14DI/10DO	6ES7214-1HH50-0XB0 CPU 1214C, DC/DC/RLY, 14DI/10DO
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	40 °C; at max. voltages and max. specifications	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	No	No	No
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide and centralized	Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users	100	100	100
Dimensions			
Width	80 mm	80 mm	80 mm
Height	125 mm	125 mm	125 mm
Depth	100 mm	100 mm	100 mm
Weights			
Weight, approx.	352 g	417 g	376 g

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Overview

The following CPUs are available for SIPLUS extreme S7-1200:

- SIPLUS S7-1200 CPU 1214C: the compact high-performance CPU

Characteristics	CPU 1214C
Versions	DC/DC/DC, AC/DC/relay, DC/DC/relay
Work memory for program, integrated	250 KB
Work memory for data, integrated	750 KB
Load memory, integrated	8 MB
Memory card	SIMATIC Memory Card (optional)
Digital inputs/outputs, integrated	14/10
Process image	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal modules	max. 10

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Overview



- Controller for intro to S7 with flexible expansion options
- Expandable by:
  - 10 extension modules (SM, CM, or CP)

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1214C	
SIPLUS S7-1200 G2: CPU 1214C DC/DC/DC With conformal coating -40...+70 °C. Power supply: 20.4-28.8 V DC; onboard I/O: 14x DI 24 V DC; 10 DO 24 V DC; memory: program 250 KB, data: 750 KB, retentivity: 20 KB	**6AG1214-1AH50-7XB0**
SIPLUS S7-1200 G2: CPU 1214C AC/DC/RLY With conformal coating -40...+70 °C. Power supply: 85-264 V AC at 47-63 Hz; onboard I/O: 14x DI 24 V DC; 10 DO relay 2 A; memory: program 250 KB, data: 750 KB, retentivity: 20 KB	**6AG1214-1BH50-7XB0**
SIPLUS S7-1200 G2: CPU 1214C DC/DC/RLY With conformal coating -40...+70 °C. Power supply: 20.4-28.8 V DC; onboard I/O: 14x DI 24 V DC; 10 DO relay 2 A; memory: program 250 KB, data: 750 KB, retentivity: 20 KB	**6AG1214-1HH50-7XB0**
Accessories	
DIN rail 35 mm	
Length 483 mm for 19" cabinets	**6ES5710-8MA11**
Length 530 mm for 600 mm cabinets	**6ES5710-8MA21**
Length 830 mm for 900 mm cabinets	**6ES5710-8MA31**
Length 2 m	**6ES5710-8MA41**
SIMATIC S7-1200, SIM 1274 simulator module For CPU 1214, 14 input switches, 24 V DC	**6ES7274-1XH50-0XA0**
Quick-fit end retainer Can be equipped with labels and terminal strip markers, width 5.15 mm, gray	**8WH9150-0CA00**
Other accessories	See SIMATIC S7-1200 G2 CPU 1214C

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Technical specifications

Article number	6AG1214-1HH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1AH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1BH50-7XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
General information			
Product type designation	CPU 1214C DC/DC/Relay	CPU 1214C DC/DC/DC	CPU 1214C AC/DC/Relay
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	
Rated value (AC)			
• 120 V AC			Yes
• 230 V AC			Yes
Storage			
Work memory			
• integrated	1 000 kbyte	1 000 kbyte	1 000 kbyte
• integrated (for program)	250 kbyte	250 kbyte	250 kbyte
• integrated (for data)	750 kbyte	750 kbyte	750 kbyte
Load memory			
• integrated	8 Mbyte	8 Mbyte	8 Mbyte
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte; with SIMATIC memory card	32 Gbyte; with SIMATIC memory card	32 Gbyte; with SIMATIC memory card
CPU processing times			
for bit operations, typ.	37 ns; / instruction	37 ns; / instruction	37 ns; / instruction
for word operations, typ.	30 ns; / instruction	30 ns; / instruction	30 ns; / instruction
for floating point arithmetic, typ.	74 ns; / instruction	74 ns; / instruction	74 ns; / instruction
Data areas and their retentivity			
Flag			
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	8; HSC (High Speed Counting)	8; HSC (High Speed Counting)	8; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; Relays	10; 20 kHz or 100 kHz	10; Relays
• of which high-speed outputs		4; 100 kHz (Qa.0 - Qa.3)	
Analog inputs			
Number of analog inputs	0	0	0
Analog outputs			
Number of analog outputs	0	0	0

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Technical specifications (continued)

Article number	6AG1214-1HH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1AH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1BH50-7XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Interface types			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	Yes	Yes	Yes
- IRT	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes	Yes
- Number of connectable IO Devices, max.	31	31	31
- Of which IO devices with IRT, max.	31	31	31
- Number of connectable IO Devices for RT, max.	31	31	31
- of which in line, max.	31	31	31
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
PROFINET IO Device			
- Services			
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No	No
- IRT	Yes	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2	2
Protocols			
Number of connections			
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode			
- Media redundancy			
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRPD	Yes	Yes	Yes
SIMATIC communication			
• S7 routing	No	No	No

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Technical specifications (continued)

Article number	6AG1214-1HH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1AH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1BH50-7XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max
Supported technology objects			
Motion Control	Yes	Yes	Yes
• Number of available Motion Control resources for technology objects	800	800	800
• Required Motion Control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
• Number of available Extended Motion Control resources for technology objects	40	40	40
• Required Extended Motion Control resources			
- per cam (1 000 points and 50 segments)	2; 1000 points and 1 segment	2; 1000 points and 1 segment	2; 1000 points and 1 segment
- for each set of kinematics	30	30	30
• kinematics functions			
- kinematics with up to 4 interpolating axes	Yes	Yes	Yes
- kinematics with 5 or more interpolating axes	No	No	No
- user-defined kinematics	No	No	No
- SIMATIC Safe Kinematics	No	No	No
Security			
signed firmware update	Yes	Yes	Yes
Secure Boot	Yes	Yes	Yes
safely removing data	No	No	No

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Technical specifications (continued)

Article number	6AG1214-1HH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1AH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1BH50-7XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C	-40 °C	-40 °C
• max.	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications	40 °C; at max. voltages and max. specifications	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1214-1HH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/RLY	6AG1214-1AH50-7XB0 SIPLUS S7-1200 CPU 1214C DC/DC/DC	6AG1214-1BH50-7XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide	Yes; device-wide
• Number of users	100	100	100
Dimensions			
Width	80 mm	80 mm	80 mm
Height	125 mm	125 mm	125 mm
Depth	100 mm	100 mm	100 mm
Weights			
Weight, approx.	376 g	352 g	417 g

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Overview



The fail-safe SIMATIC S7-1200 G2 Controllers are based on the S7-1200 G2 standard CPUs and offer additional safety-related functions.

They can be used for safety-related tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured blocks for safety-related functions certified by the German Technical Inspectorate (TÜV).

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of standard I/O modules
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via fieldbus such as PROFINET
  - F-library certified by the German Technical Inspectorate (TÜV) for all common safety functions
  - Free programming of the safety logic using FBD and LAD
  - Standard-compliant printout of the F-program
- Integrated engineering for standard and safety:
  - Safety Basic integrated in STEP 7 Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio

Overview (continued)

- Integrated system diagnostics of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostics information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	CPU 1212FC	CPU 1214FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay
Work memory for program, integrated	200 KB	300 KB
Work memory for data, integrated	500 KB	750 KB
Load memory, integrated	8 MB	8 MB
Memory card	SIMATIC Memory Card (optional)	
Digital inputs/outputs, integrated	8/6	14/10
Process image	1024 bytes for inputs, 1024 bytes for outputs	
Expansion by signal board	Max. 1	Max. 2
Expansion by signal modules	Max. 6	Max. 10

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Selection and ordering data

CPU 1212FC	
SIMATIC S7-1200 G2: Failsafe compact CPU 1212FC DC/DC/DC Power supply: 20.4-28.8 V DC; Onboard I/O: 8 x DI 24 V DC; 6 x DO 24 V DC; Memory: program 200 KB, data 500 KB, retentivity 20 KB	**6ES7212-1AF50-0XB0**
SIMATIC S7-1200 G2: Failsafe compact CPU 1212FC DC/DC/RLY Power supply: 20.4-28.8 V DC; Onboard I/O: 8 x DI 24 V DC; 6 x DO relays 2 A; Memory: program 200 KB, data 500 KB, retentivity 20 KB	**6ES7212-1HF50-0XB0**
CPU 1214FC	
SIMATIC S7-1200 G2: Failsafe compact CPU 1214FC DC/DC/DC Power supply: 20.4-28.8 V DC; Onboard I/O: 14 x DI 24 V DC; 10 x DO 24 V DC; memory: program 300 KB, data 750 KB, retentivity 20 KB	**6ES7214-1AF50-0XB0**
SIMATIC S7-1200 G2: Failsafe compact CPU 1214FC DC/DC/RLY Power supply: 20.4-28.8 V DC; Onboard I/O: 14 x DI 24 V DC; 10 x DO relays 2 A; memory: program 300 KB, data 750 KB, retentivity 20 KB	**6ES7214-1HF50-0XB0**
Accessories	
SB 1221 signal board	
SIMATIC S7-1200 G2, SB 1221 digital input module 8 DI 100 kHz; inputs: 8 x DI 24 V DC sink/source, 100 kHz	**6ES7221-3BF50-0XB0**
SB 1222 signal board	
SIMATIC S7-1200 G2, SB 1222 digital output module 8 DO 100 kHz; outputs: 8 x DQ 24 V DC 0.1 A sinking/sourcing transistor, 100 kHz	**6ES7222-5BF50-0XB0**
SB 1223 signal board	
SIMATIC S7-1200 G2, SB 1223 digital I/O module 4 DI/4 DO 200 kHz; inputs: 4 x DI 5 V DC, 200 kHz; outputs: 4 x DQ 5 V DC 0.1 A, sinking/sourcing transistor, 200 kHz	**6ES7223-7AF50-0XB0**
SIMATIC S7-1200 G2, SB 1223 digital I/O module 4 DI/4 DO 100 kHz; inputs: 4 x DI 24 V DC sink/source, 100 kHz; outputs: 4 x DQ 24 V DC 0.1 A sinking/sourcing transistor, 100 kHz	**6ES7223-7BF50-0XB0**
SB 1231 signal board	
SIMATIC S7-1200 G2, SB 1231 analog input module 4 AI; inputs: 4 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA)	**6ES7231-4HD50-0XB0**
SB 1232 signal board	
SIMATIC S7-1200 G2, SB 1232 analog output module 1 AO, +/-10 V DC (12-bit resolution) or 0-20 mA (11-bit resolution)	**6ES7232-4HD50-0XB0**
SB 1233 signal board	
SIMATIC S7-1200 G2, SB 1233 analog I/O module 2 AI/2 AO, inputs: 2 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA), outputs: 2 x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6ES7233-4HD50-0XB0**
SIMATIC Memory Card (optional)	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**

Selection and ordering data (continued)

SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
STEP 7 Professional / Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1200 G2/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-0AA25-0YA5**
SIMATIC STEP 7 Basic V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading; Class A; for configuring SIMATIC S7-1200/1200 G2; SIMATIC Basic Panels; SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

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Technical specifications

Article number	6ES7212-1AF50-0XB0 CPU 1212FC ,DC/DC/DC, 8DI/6DQ	6ES7212-1HF50-0XB0 CPU 1212FC ,DC/DC/RLY, 8DI/6DO
General information		
Product type designation	CPU 1212FC DC/DC/DC	CPU 1212FC DC/DC/Relay
Engineering with		
• Programming package	STEP 7 V21 or higher	STEP 7 V21 or higher
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Storage		
Work memory		
• Integrated	700 kbyte	700 kbyte
• integrated (for program)	200 kbyte	200 kbyte
• integrated (for data)	500 kbyte	500 kbyte
Load memory		
• Integrated	8 Mbyte	8 Mbyte
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte; with SIMATIC memory card	32 Gbyte; with SIMATIC memory card
CPU processing times		
for bit operations, typ.	37 ns; / instruction	37 ns; / instruction
for word operations, typ.	30 ns; / instruction	30 ns; / instruction
for floating point arithmetic, typ.	74 ns; / instruction	74 ns; / instruction
Data areas and their retentivity		
Flag		
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Address area		
I/O address area		
• Inputs	1 kbyte; All inputs are in the process image	1 kbyte; All inputs are in the process image
• Outputs	1 kbyte; All outputs are in the process image	1 kbyte; All outputs are in the process image
Time of day		
Clock		
• Hardware clock (real-time)	Yes	Yes
Digital inputs		
Number of digital inputs	8; Integrated	8; Integrated
• of which inputs usable for technological functions	8; HSC (High Speed Counting)	8; HSC (High Speed Counting)
Digital outputs		
Number of digital outputs	6; 20 kHz or 100 kHz	6; Relays
• of which high-speed outputs	4; 100 kHz (Qa.0 - Qa.3)	
Analog inputs		
Number of analog inputs	0	0
Analog outputs		
Number of analog outputs	0	0

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Technical specifications (continued)

Article number	6ES7212-1AF50-0XB0 CPU 1212FC ,DC/DC/DC, 8DI/6DQ	6ES7212-1HF50-0XB0 CPU 1212FC ,DC/DC/RLY, 8DI/6DO
1. Interface		
Interface type	PROFINET	PROFINET
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	Yes	Yes
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Number of connectable IO Devices, max.	31	31
- Of which IO devices with IRT, max.	31	31
- Number of connectable IO Devices for RT, max.	31	31
- of which in line, max.	31	31
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
PROFINET IO Device		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
- Asset management record	Yes	Yes
Protocols		
Number of connections		
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode		
- Media redundancy		
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	Yes	Yes
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6ES7212-1AF50-0XB0 CPU 1212FC ,DC/DC/DC, 8DI/6DQ	6ES7212-1HF50-0XB0 CPU 1212FC ,DC/DC/RLY, 8DI/6DO
Communication functions		
S7 communication		
• supported	Yes	Yes
Number of connections		
• overall	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max
Supported technology objects		
Motion Control	Yes	Yes
• Number of available Motion Control resources for technology objects	800	800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
• Number of available Extended Motion Control resources for technology objects	40	40
• Required Extended Motion Control resources		
- per cam (1 000 points and 50 segments)	2	2
- for each set of kinematics	30	30
• kinematics functions		
- kinematics with up to 4 interpolating axes	Yes	Yes
- kinematics with 5 or more interpolating axes	No	No
- user-defined kinematics	No	No
- SIMATIC Safe Kinematics	No	No
Security		
PROFINET Security Class	1	1
signed firmware update	Yes	Yes
Secure Boot	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; No condensation	-20 °C; No condensation
• max.	40 °C; at max. voltages and max. specifications	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	No	No
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users	100	100

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Technical specifications (continued)

Article number	6ES7212-1AF50-0XB0 CPU 1212FC ,DC/DC/DC, 8DI/6DQ	6ES7212-1HF50-0XB0 CPU 1212FC ,DC/DC/RLY, 8DI/6DO
Dimensions		
Width	70 mm	70 mm
Height	125 mm	125 mm
Depth	100 mm	100 mm
Weights		
Weight, approx.	319 g	333 g

Article number	6ES7214-1AF50-0XB0 CPU 1214FC ,DC/DC/DC, 14DI/10DQ	6ES7214-1HF50-0XB0 CPU 1214FC ,DC/DC/RLY, 14DI/10DO
General information		
Product type designation	CPU 1214FC DC/DC/DC	CPU 1214FC DC/DC/Relay
Engineering with		
• Programming package	STEP 7 V21 or higher	STEP 7 V21 or higher
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Storage		
Work memory		
• Integrated	1 050 kbyte	1 050 kbyte
• integrated (for program)	300 kbyte	300 kbyte
• integrated (for data)	750 kbyte	750 kbyte
Load memory		
• Integrated	8 Mbyte	8 Mbyte
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte; with SIMATIC memory card	32 Gbyte; with SIMATIC memory card
CPU processing times		
for bit operations, typ.	37 ns; / instruction	37 ns; / instruction
for word operations, typ.	30 ns; / instruction	30 ns; / instruction
for floating point arithmetic, typ.	74 ns; / instruction	74 ns; / instruction
Data areas and their retentivity		
Flag		
• Size, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Address area		
I/O address area		
• Inputs	1 kbyte; All inputs are in the process image	1 kbyte; All inputs are in the process image
• Outputs	1 kbyte; All outputs are in the process image	1 kbyte; All outputs are in the process image
Time of day		
Clock		
• Hardware clock (real-time)	Yes	Yes
Digital inputs		
Number of digital inputs	14; Integrated	14; Integrated
• of which inputs usable for technological functions	8; HSC (High Speed Counting)	8; HSC (High Speed Counting)
Digital outputs		
Number of digital outputs	10; 20 kHz or 100 kHz	10; Relays
• of which high-speed outputs	4; 100 kHz (Qa.0 - Qa.3)	
Analog inputs		
Number of analog inputs	0	0
Analog outputs		
Number of analog outputs	0	0

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Technical specifications (continued)

Article number	6ES7214-1AF50-0XB0 CPU 1214FC ,DC/DC/DC, 14DI/10DQ	6ES7214-1HF50-0XB0 CPU 1214FC ,DC/DC/RLY, 14DI/10DO
1. Interface		
Interface type	PROFINET	PROFINET
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	Yes	Yes
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Number of connectable IO Devices, max.	31	31
- Of which IO devices with IRT, max.	31	31
- Number of connectable IO Devices for RT, max.	31	31
- of which in line, max.	31	31
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
PROFINET IO Device		
- Services		
- PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
- Asset management record	Yes	Yes
Protocols		
Number of connections		
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode		
- Media redundancy		
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	Yes	Yes
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required

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Technical specifications (continued)

Article number	6ES7214-1AF50-0XB0 CPU 1214FC ,DC/DC/DC, 14DI/10DQ	6ES7214-1HF50-0XB0 CPU 1214FC ,DC/DC/RLY, 14DI/10DO
Communication functions		
S7 communication		
• supported	Yes	Yes
Number of connections		
• overall	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max
Supported technology objects		
Motion Control	Yes	Yes
• Number of available Motion Control resources for technology objects	800	800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
• Number of available Extended Motion Control resources for technology objects	40	40
• Required Extended Motion Control resources		
- per cam (1 000 points and 50 segments)	2	2
- for each set of kinematics	30	30
• kinematics functions		
- kinematics with up to 4 interpolating axes	Yes	Yes
- kinematics with 5 or more interpolating axes	No	No
- user-defined kinematics	No	No
- SIMATIC Safe Kinematics	No	No
Security		
PROFINET Security Class	1	1
signed firmware update	Yes	Yes
Secure Boot	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; No condensation	-20 °C; No condensation
• max.	40 °C; at max. voltages and max. specifications	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	No	No
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users	100	100

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Technical specifications (continued)

Article number	6ES7214-1AF50-0XB0 CPU 1214FC ,DC/DC/DC, 14DI/10DQ	6ES7214-1HF50-0XB0 CPU 1214FC ,DC/DC/RLY, 14DI/10DO
Dimensions		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	100 mm	100 mm
Weights		
Weight, approx.	352 g	376 g

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Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs

Selection and ordering data

SM 1221 digital input signal module	
SIMATIC S7-1200 G2: SM 1221 digital input module 16 DI Inputs: 16 x DI 24 V DC sink/source	**6ES7221-1BH50-0XB0**

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Technical specifications

Article number	6ES7221-1BH50-0XB0 SM 1221 Digital Input , 16DI
General information	
Product type designation	SM 1221, DI 16x 24 V DC
Input current	
from backplane bus 5 V DC, max.	90 mA
Digital inputs	
• from load voltage L+ (without load), max.	4.1 mA; per channel
Digital inputs	
Number of digital inputs	16
• in groups of	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	5 V DC or 0.5 mA
• for signal "1"	15 V DC at 2.5 mA
Input current	
• for signal "1", typ.	4.1 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs	
- Parameterizable	No
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	No
Diagnoses	
• Monitoring the supply voltage	No
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes; 707 V DC (type test)
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	166 g

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Overview



- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 G2 CPUs
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2, SB 1221 digital input module, 8 DI 100 kHz Inputs: 8 x DI 24 V DC sink/source, 100 kHz	**6ES7221-3BF50-0XB0**

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Technical specifications

Article number	6ES7221-3BF50-0XB0 SB 1221 Signal Board, 8DI 24VDC 100kHz
General information	
Product type designation	SB 1221, DI 8x 24 V DC 100 kHz
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 or higher
Input current	
from backplane bus 5 V DC, typ.	108 mA
Digital inputs	
• from load voltage L+ (without load), max.	6 mA; per channel
Digital inputs	
Number of digital inputs	8; sink / source
• in groups of	8
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
- all mounting positions	
- up to 40 °C, max.	8
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	5 V DC or 0.5 mA
• for signal "1"	15 V DC at 2.5 mA
Input current	
• for signal "0", max. (permissible quiescent current)	0.5 mA
• for signal "1", min.	3.3 mA
• for signal "1", typ.	6 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
- for interrupt inputs	
- Parameterizable	Yes
- for technological functions	
- parameterizable	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	No
Diagnoses	
• Monitoring the supply voltage	No
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes; 707 V DC (type test)
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No

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Technical specifications (continued)

Article number	6ES7221-3BF50-0XB0 SB 1221 Signal Board, 8DI 24VDC 100kHz
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	40 °C; at max. voltages and max. specifications
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm
Weights	
Weight, approx.	26 g

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs

Selection and ordering data

SM 1222 digital output signal module	
SIMATIC S7-1200 G2: SM 1222 digital output module 16 DO Outputs: 16 x DO, 24 V DC 0.5 A, sourcing transistor	**6ES7222-5BH50-0XB0**
SIMATIC S7-1200 G2: SM 1222 digital output module, 16RLY Outputs: 16 x DO, relay 2 A	**6ES7222-5HH50-0XB0**

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Technical specifications

Article number	6ES7222-5BH50-0XB0 SM 1222 Digital Output, 16DQ	6ES7222-5HH50-0XB0 SM 1222 Digital Output, 16RLY
General information		
Product type designation	SM 1222, DQ 16x 24 V DC/0.5 A	SM 1222, DQ 16x relay/2 A
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
from backplane bus 5 V DC, max.	120 mA	115 mA
Digital outputs		
• from load voltage L+, max.	45 mA	9 mA; per relay coil
Digital outputs		
Number of digital outputs	16	16
• in groups of	8	8
Short-circuit protection	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -40 V, 1 W dissipation	
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	2 A
• on lamp load, max.	5 W	30 W with DC, 200 W with AC
Output voltage		
• Rated value (DC)	24 V	5 V DC to 30 V DC
• Rated value (AC)		5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	
• for signal "1", min.	L+ (-0.5 V)	
Output current		
• for signal "1" rated value	0.5 A	2 A
• for signal "0" residual current, max.	10 µA	
Output delay with resistive load		
• "0" to "1", max.	50 µs	10 ms
• "1" to "0", max.	200 µs	10 ms
Total current of the outputs (per group)		
- horizontal installation		
- up to 50 °C, max.	4 A; Current per mass (Group of 8)	16 A; Current per mass
Relay outputs		
• Number of relay outputs		16
• Rated supply voltage of relay coil L+ (DC)		24 V
• Number of operating cycles, max.		mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts		
- with inductive load, max.		2 A
- on lamp load, max.		30 W with DC, 200 W with AC
- with resistive load, max.		2 A
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
Diagnostics indication LED		
• DIAG LED	Yes	Yes
• for status of the outputs	Yes	Yes
Potential separation		
Potential separation digital outputs		
• between the channels and backplane bus	707 V DC (type test)	Yes; 1500 V AC (type test)
Degree and class of protection		
IP degree of protection	IP20	IP20

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Technical specifications (continued)

Article number	6ES7222-5BH50-0XB0 SM 1222 Digital Output, 16DQ	6ES7222-5HH50-0XB0 SM 1222 Digital Output, 16RLY
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	No	No
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	No	No
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	No	No
Ambient conditions		
Ambient temperature during operation		
• min.		-20 °C; No condensation
• max.		40 °C; at max. voltages and max. specifications
Connection method		
required front connector	No	No
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	30 mm	30 mm
Height	125 mm	125 mm
Depth	100 mm	100 mm
Weights		
Weight, approx.	173 g	217 g

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Overview



- Digital outputs as a supplement to the integral I/O of the SIMATIC S7-1200 G2 CPUs
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2, SB 1222 digital output module, 8 DO 100 kHz Outputs: 8 x DQ 24 V DC 0.1 A sinking/sourcing transistor, 100 kHz	**6ES7222-5BF50-0XB0**

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Technical specifications

Article number	6ES7222-5BF50-0XB0 SB 1222 Signal Board, 8DQ 24VDC 100kHz
General information	
Product type designation	SB 1222, DQ 8x 24 V DC 100 kHz
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 or higher
Supply voltage	
Rated value (DC)	24 V
Input current	
from backplane bus 5 V DC, typ.	30 mA
Digital outputs	
• from load voltage L+, max.	15 mA
Digital outputs	
Number of digital outputs	8
• in groups of	8
Short-circuit protection	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.1 A
Output voltage	
• Rated value (DC)	24 V
• for signal "0", max.	1 V
• for signal "1", min.	L+ (-1.5 V)
Output current	
• for signal "1" rated value	0.1 A
Output delay with resistive load	
• "0" to "1", max.	1.8 µs
• "1" to "0", max.	1.8 µs
Total current of the outputs (per group)	
- horizontal installation	
- up to 50 °C, max.	0.4 A
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the outputs	Yes
Potential separation	
Potential separation digital outputs	
• between the channels and backplane bus	Yes; 707 V DC (type test)
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	40 °C; at max. voltages and max. specifications

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Technical specifications (continued)

Article number	6ES7222-5BF50-0XB0 SB 1222 Signal Board, 8DQ 24VDC 100kHz
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm
Weights	
Weight, approx.	29 g

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Overview



- Digital inputs and outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs and outputs

Selection and ordering data

SM 1223 digital input/output signal module	
SIMATIC S7-1200 G2, SM 1223 digital input/output module, 8 DI/8 DO Inputs: 8 x DI 24 V DC sink/source Outputs: 8 x DO, 24 V DC 0.5 A, sourcing transistor	**6ES7223-5BH50-0XB0**
SIMATIC S7-1200 G2, SM 1223 digital input/output module, 8 DI/8 RLY; Inputs: 8 x DI 24 V DC sink/source; Outputs: 8 x DO relay 2 A	**6ES7223-5PH50-0XB0**
SIMATIC S7-1200 G2, SM 1223 digital I/O, 16 DI / 16 DO; Inputs: 16x DI 24 V DC, sourcing/sinking input; Outputs: 16x DO, sourcing output, PNP transistor 0.5 A	**6ES7223-5BL50-0XB0**
SIMATIC S7-1200 G2, SM 1223 digital I/O, 16 DI / 16 DO; Inputs: 16x DI 24 V DC, sourcing/sinking input; Outputs 16x DO, sinking output, NPN transistor 0.5 A	**6ES7223-5BL50-1XB0**
SIMATIC S7-1200 G2, SM 1223 digital I/O, 16 DI / 16 DO; Inputs: 16x DI 24 V DC, sourcing/sinking input; Outputs: 16x DO, relay 2 A	**6ES7223-5PL50-0XB0**

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Technical specifications

Article number	6ES7223-5BH50-0XB0 SM 1223 Digital I/O, 8DI/8DO	6ES7223-5PH50-0XB0 SM 1223 Digital I/O, 8DI/8RLY	6ES7223-5BL50-0XB0 SM 1223 Digital I/O, 16DI/16DO	6ES7223-5BL50-1XB0 SM 1223 Digitale E/A, 16DI/16DO Sink	6ES7223-5PL50-0XB0 SM 1223 Digital I/O, 16DI/16DO
General information					
Product type designation	SM 1223, DI 8x 24 V DC, DQ 8x 24 V DC 0.5A	SM 1223, DI 8x 24 V DC, DQ 8x relay	SM 1223, DI 16x24 V DC, DQ 16x24 V DC	SM 1223, DI 16x24 V DC, DO 16x 24 V DC Sink	SM 1223, DI 16x24 V DC, DQ 16x relay
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Input current					
Current consumption, typ.			45 mA	40 mA	175 mA
from backplane bus 5 V DC, max.	110 mA	105 mA	165 mA	165 mA	160 mA
Digital inputs					
• from load voltage L+ (without load), max.	4.1 mA; per channel	4.1 mA; per channel	4.1 mA; per channel	4.1 mA; per channel	4.1 mA; per channel
Digital outputs					
• from load voltage L+, max.	45 mA	9 mA; per relay coil			9 mA; per relay coil
Output voltage					
Power supply to the transmitters					
• present				Yes	
Digital inputs					
Number of digital inputs	8	8	16	16	16
• in groups of	4	4	4	4	4
Sourcing/sinking input			Yes	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs					
- all mounting positions					
- up to 40 °C, max.	8	8	16	16	16
- horizontal installation					
- up to 40 °C, max.	8	8	16	16	16
- up to 50 °C, max.	8	8	16	16	16
- vertical installation					
- up to 40 °C, max.	8	8	16	16	16
Input voltage					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• for signal "0"	5 V DC or 0.5 mA	5 V DC or 0.5 mA	5 V DC or 0.5 mA	5 V DC or 0.5 mA	5 V DC or 0.5 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA
Input current					
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4.1 mA	4 mA	4.1 mA	4.1 mA	4 mA
Input delay (for rated value of input voltage)					
- for standard inputs					
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs					
- Parameterizable	No	No	No	No	No

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Technical specifications (continued)

Article number	6ES7223-5BH50-0XB0 SM 1223 Digital I/O, 8DI/8DO	6ES7223-5PH50-0XB0 SM 1223 Digital I/O, 8DI/8RLY	6ES7223-5BL50-0XB0 SM 1223 Digital I/O, 16DI/16DO	6ES7223-5BL50-1XB0 SM 1223 Digitale E/A, 16DI/16DO Sink	6ES7223-5PL50-0XB0 SM 1223 Digital I/O, 16DI/16DO
Digital outputs					
Number of digital outputs	8	8	16	16; Transistor current sinking	16
• in groups of	8	8	8	8	8
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -40 V, 1 W dissipation		typ. (L+) -40 V, 1 W dissipation	Typ 45 V	
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	2 A	0.5 A	0.5 A	2 A
• on lamp load, max.	5 W	30 W with DC, 200 W with AC	5 W	5 W	30 W with DC, 200 W with AC
Output voltage					
• Rated value (DC)	24 V	5 V DC to 30 V DC	24 V	24 V	5 V DC to 30 V DC
• Rated value (AC)		5 V AC to 250 V AC			5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load		0.1 V; with 10 kOhm load	0.5 V; with 10 kOhm load	
• for signal "1", min.	20 V DC		20 V DC	20 V DC	
Output current					
• for signal "1" rated value	0.5 A	2 A	0.5 A	0.5 A	2 A
• for signal "0" residual current, max.	10 µA		10 µA	75 µA	
Output delay with resistive load					
• "0" to "1", max.	50 µs	10 ms	50 µs	350 µs	10 ms
• "1" to "0", max.	200 µs	10 ms	200 µs	20 µs	10 ms
Total current of the outputs (per group)					
- horizontal installation					
- up to 50 °C, max.	2 A; Current per mass	16 A; Current per mass	4 A; Current per mass	4 A; Current per mass	16 A; Current per mass
Relay outputs					
• Number of relay outputs		8			16
• Rated supply voltage of relay coil L+ (DC)		24 V			24 V
• Number of operating cycles, max.		mechanically 10 million, at rated load voltage 100 000			mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts					
- with inductive load, max.		2 A	0.5 A	0.5 A	2 A
- on lamp load, max.		30 W with DC, 200 W with AC	5 W	5 W	30 W with DC, 200 W with AC
- with resistive load, max.		2 A	0.5 A	0.5 A	2 A
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• DIAG LED	Yes		Yes	Yes	Yes
• for status of the inputs	Yes	Yes	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes	Yes	Yes
• for maintenance		Yes			

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Technical specifications (continued)

Article number	6ES7223-5BH50-0XB0 SM 1223 Digital I/O, 8DI/8DO	6ES7223-5PH50-0XB0 SM 1223 Digital I/O, 8DI/8RLY	6ES7223-5BL50-0XB0 SM 1223 Digital I/O, 16DI/16DO	6ES7223-5BL50-1XB0 SM 1223 Digitale E/A, 16DI/16DO Sink	6ES7223-5PL50-0XB0 SM 1223 Digital I/O, 16DI/16DO
Potential separation					
Potential separation digital inputs					
• between the channels and backplane bus	Yes; 707 V DC (type test)	Yes; 707 V DC (type test)	Yes; 707 V DC (type test)	Yes; 707 V DC (type test)	Yes; 707 V DC (type test)
Potential separation digital outputs					
• between the channels and backplane bus	Yes; 707 V DC (type test)	Yes; 4 200 V DC (type test)	Yes; 707 V DC (type test)	Yes; 707 V DC (type test)	Yes; 4 200 V DC (type test)
Degree and class of protection					
IP degree of protection	IP20	IP20	IP20	IP20	IP20
Standards, approvals, certificates					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	No	No	No	No	No
UL approval	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
FM approval	No	No	No	No	No
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes
KC approval	Yes	Yes	Yes	Yes	Yes
Marine approval	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• min.		-20 °C; No condensation			-20 °C; No condensation
• max.		40 °C; at max. voltages and max. specifications			40 °C; at max. voltages and max. specifications
Connection method					
required front connector	No	No	No	No	No
Mechanics/material					
Enclosure material (front)					
• plastic	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	30 mm	30 mm	50 mm	50 mm	50 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	100 mm	100 mm	100 mm	100 mm	100 mm
Weights					
Weight, approx.	170 g	194 g	262 g	260 g	311 g

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Overview



- Digital inputs and outputs as a supplement to the integral I/O of the SIMATIC S7-1200 G2 CPUs
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2, SB 1223 digital I/O module, 4 DI/4 DO 200 kHz Inputs: 4 x DI 5 V DC, 200 kHz; Outputs: 4 x DQ 5 V DC 0.1 A sinking/sourcing transistor, 200 kHz	**6ES7223-7AF50-0XB0**
SIMATIC S7-1200 G2, SB 1223 digital I/O module, 4 DI/4 DO 200 kHz Inputs: 4 x DI 5 V DC, 200 kHz; Outputs: 4 x DQ 5 V DC 0.1 A sinking/sourcing transistor, 200 kHz	**6ES7223-7BF50-0XB0**

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Technical specifications

Article number	6ES7223-7AF50-0XB0 SB 1223 Signal Board, 4DI/4DQ 5V 200kHz	6ES7223-7BF50-0XB0 SB 1223 Signal Board, 4DI/4DQ 24V 100kHz
General information		
Product type designation	SB 1223, DI 4x 5 V DC/DQ 4x 5 V DC 200 kHz	SB 1223, DI 4x 24 V DC/DQ 4x 24 V DC 100 kHz
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V20 or higher	V20 or higher
Supply voltage		
Rated value (DC)	5 V	24 V
Input current		
from backplane bus 5 V DC, typ.	60 mA	48 mA
Digital inputs		
• from load voltage L+ (without load), max.	15 mA; per channel	6 mA; per channel
Digital outputs		
• from load voltage L+, max.	12 mA	15 mA
Digital inputs		
Number of digital inputs	4; Current-sourcing	4; sink / source
• in groups of	4	4
Input characteristic curve in accordance with IEC 61131, type 1		Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 40 °C, max.	4	4
Input voltage		
• Rated value (DC)	5 V	24 V
• for signal "0"	(L+ minus 1.0 V DC) ... L+ (2.2 ... 0 mA)	5 V DC or 0.5 mA
• for signal "1"	0 V ... (L+ minus 2.0 V DC) (20 ... 5.1 mA)	15 V DC at 2.5 mA
Input current		
• for signal "0", max. (permissible quiescent current)	2.2 mA	0.5 mA
• for signal "1", min.	5.1 mA	3.3 mA
• for signal "1", typ.	15 mA	6 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
- for interrupt inputs		
- Parameterizable	Yes	Yes
- for technological functions		
- parameterizable	Yes	Yes
Digital outputs		
Number of digital outputs	4	4
• in groups of	4	4
Short-circuit protection	No	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.1 A	0.1 A
Output voltage		
• Rated value (DC)	5 V	24 V
• for signal "0", max.	0.2 V	1 V
• for signal "1", min.	L+ (-0.7 V)	L+ (-1.5 V)
Output current		
• for signal "1" rated value	0.1 A	0.1 A
Output delay with resistive load		
• "0" to "1", max.	500 ns	1.8 µs
• "1" to "0", max.	500 ns	1.8 µs
Total current of the outputs (per group)		
- horizontal installation		
- up to 50 °C, max.	0.2 A	0.2 A

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Technical specifications (continued)

Article number	6ES7223-7AF50-0XB0 SB 1223 Signal Board, 4DI/4DQ 5V 200kHz	6ES7223-7BF50-0XB0 SB 1223 Signal Board, 4DI/4DQ 24V 100kHz
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
Diagnostics indication LED		
• DIAG LED	Yes	Yes
• for status of the inputs	Yes	Yes
• for status of the outputs	Yes	Yes
Potential separation		
Potential separation digital inputs		
• between the channels and backplane bus	Yes; 707 V DC (type test)	Yes; 707 V DC (type test)
Potential separation digital outputs		
• between the channels and backplane bus	Yes; 707 V DC (type test)	Yes; 707 V DC (type test)
Degree and class of protection		
IP degree of protection		IP20
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	No	No
UL approval	Yes	Yes
cULus	Yes	Yes
FM approval	No	No
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Marine approval	No	No
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	40 °C; at max. voltages and max. specifications	40 °C; at max. voltages and max. specifications
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	15 mm	15 mm
Height	62 mm	62 mm
Depth	63 mm	63 mm
Weights		
Weight, approx.	28 g	28 g

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Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS S7-1200 G2: SM1221 16DI With conformal coating -40...+70 °C. Inputs: 16x DI 24 V DC sink/source	**6AG1221-1BH50-7XB0**

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Technical specifications

Article number	6AG1221-1BH50-7XB0 SIPLUS S7-1200 SM1221 16DI
General information	
Product type designation	SM 1221, DI 16x 24 V DC
Input current	
from backplane bus 5 V DC, max.	90 mA
Digital inputs	
• from load voltage L+ (without load), max.	4.1 mA; per channel
Digital inputs	
Number of digital inputs	16
• in groups of	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	5 V DC or 0.5 mA
• for signal "1"	15 V DC at 2.5 mA
Input current	
• for signal "1", typ.	4.1 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs	
- Parameterizable	No
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	No
Diagnoses	
• Monitoring the supply voltage	No
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes; 707 V DC (type test)
Degree and class of protection	
IP degree of protection	IP20

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Technical specifications (continued)

Article number	6AG1221-1BH50-7XB0 SIPLUS S7-1200 SM1221 16DI
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C; at max. voltages and max. specifications
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	166 g

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS S7-1200 G2: SM1222 16DQ With conformal coating -40...+70 °C. Outputs: 16x DO, 24 V DC, 0.5 A, sourcing transistor	**6AG1222-5BH50-7XB0**
SIPLUS S7-1200 G2: SM1222 16DQ RLY With conformal coating -40...+70 °C. SM 1222 digital output module, 16RLY; outputs: 16x DO, relay 2 A	**6AG1222-5HH50-7XB0**

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Technical specifications

Article number	6AG1222-5BH50-7XB0 SIPLUS S7-1200 SM1222 16DQ	6AG1222-5HH50-7XB0 SIPLUS S7-1200 SM1222 16DQ RLY
General information		
Product type designation	SM 1222, DQ 16x 24 V DC/0.5 A	SM 1222, DQ 16x relay/2 A
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
from backplane bus 5 V DC, max.	120 mA	115 mA
Digital outputs		
• from load voltage L+, max.	45 mA	9 mA; per relay coil
Digital outputs		
Number of digital outputs	16	16
• in groups of	8	8
Short-circuit protection	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -40 V, 1 W dissipation	
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	2 A
• on lamp load, max.	5 W	30 W with DC, 200 W with AC
Output voltage		
• Rated value (DC)	24 V	5 V DC to 30 V DC
• Rated value (AC)		5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	
• for signal "1", min.	L+ (-0.5 V)	
Output current		
• for signal "1" rated value	0.5 A	2 A
• for signal "0" residual current, max.	10 µA	
Output delay with resistive load		
• "0" to "1", max.	50 µs	10 ms
• "1" to "0", max.	200 µs	10 ms
Total current of the outputs (per group)		
- horizontal installation		
- up to 50 °C, max.	4 A; Current per mass (Group of 8)	16 A; Current per mass
Relay outputs		
• Number of relay outputs		16
• Rated supply voltage of relay coil L+ (DC)		24 V
• Number of operating cycles, max.		mechanically 10 million, at rated load voltage 100 000
- Switching capacity of contacts		
- with inductive load, max.		2 A
- on lamp load, max.		30 W with DC, 200 W with AC
- with resistive load, max.		2 A
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
Diagnostics indication LED		
• DIAG LED	Yes	Yes
• for status of the outputs	Yes	Yes
Potential separation		
Potential separation digital outputs		
• between the channels and backplane bus	707 V DC (type test)	Yes; 1500 V AC (type test)
Degree and class of protection		
IP degree of protection	IP20	IP20

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Technical specifications (continued)

Article number	6AG1222-5BH50-7XB0 SIPLUS S7-1200 SM1222 16DQ	6AG1222-5HH50-7XB0 SIPLUS S7-1200 SM1222 16DQ RLY
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	60 °C; at max. voltages and max. specifications	40 °C; at max. voltages and max. specifications
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method		
required front connector	No	No
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	30 mm	30 mm
Height	125 mm	125 mm
Depth	100 mm	100 mm
Weights		
Weight, approx.	173 g	217 g

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Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs and outputs

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS S7-1200 G2: SM1223 8DI / 8DQ With conformal coating -40...+70 °C. Inputs: 8x DI 24 V DC sink/source; outputs: 8x DO, 24 V DC, 0.5 A, sourcing transistor	**6AG1223-5BH50-7XB0**
SIPLUS S7-1200 G2: SIPLUS S7-1200 SM1223 8DI / 8DQ With conformal coating -40...+70 °C. Inputs: 8x DI 24 V DC sink/source; outputs: 8x DO, relay 2 A	**6AG1223-5PH50-7XB0**

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Technical specifications

Article number	6AG1223-5PH50-7XB0 SIPLUS S7-1200 SM1223 8DI / 8DQ RLY	6AG1223-5BH50-7XB0 SIPLUS S7-1200 SM1223 8DI / 8DQ
General information		
Product type designation	SM 1223, DI 8x 24 V DC, DQ 8x relay	SM 1223, DI 8x 24 V DC, DQ 8x 24 V DC 0.5A
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
from backplane bus 5 V DC, max.	105 mA	110 mA
Digital inputs		
• from load voltage L+ (without load), max.	4.1 mA; per channel	4.1 mA; per channel
Digital outputs		
• from load voltage L+, max.	9 mA; per relay coil	45 mA
Digital inputs		
Number of digital inputs	8	8
• in groups of	4	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 40 °C, max.	8	8
- horizontal installation		
- up to 40 °C, max.	8	8
- up to 50 °C, max.	8	8
- vertical installation		
- up to 40 °C, max.	8	8
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	5 V DC or 0.5 mA	5 V DC or 0.5 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA
Input current		
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4.1 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- for interrupt inputs		
- Parameterizable	No	No

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Technical specifications (continued)

Article number	6AG1223-5PH50-7XB0 SIPLUS S7-1200 SM1223 8DI / 8DQ RLY	6AG1223-5BH50-7XB0 SIPLUS S7-1200 SM1223 8DI / 8DQ
Digital outputs		
Number of digital outputs	8	8
• in groups of	8	8
Short-circuit protection	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to		typ. (L+) -40 V, 1 W dissipation
Switching capacity of the outputs		
• with resistive load, max.	2 A	0.5 A
• on lamp load, max.	30 W with DC, 200 W with AC	5 W
Output voltage		
• Rated value (DC)	5 V DC to 30 V DC	24 V
• Rated value (AC)	5 V AC to 250 V AC	
• for signal "0", max.		0.1 V; with 10 kOhm load
• for signal "1", min.		20 V DC
Output current		
• for signal "1" rated value	2 A	0.5 A
• for signal "0" residual current, max.		10 µA
Output delay with resistive load		
• "0" to "1", max.	10 ms	50 µs
• "1" to "0", max.	10 ms	200 µs
Total current of the outputs (per group)		
- horizontal installation		
- up to 50 °C, max.	16 A; Current per mass	2 A; Current per mass
Relay outputs		
• Number of relay outputs	8	
• Rated supply voltage of relay coil L+ (DC)	24 V	
• Number of operating cycles, max.	mechanically 10 million, at rated load voltage 100 000	
- Switching capacity of contacts		
- with inductive load, max.	2 A	
- on lamp load, max.	30 W with DC, 200 W with AC	
- with resistive load, max.	2 A	
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
Diagnostics indication LED		
• DIAG LED		Yes
• for status of the inputs	Yes	Yes
• for status of the outputs	Yes	Yes
• for maintenance	Yes	
Potential separation		
Potential separation digital inputs		
• between the channels and backplane bus	Yes; 707 V DC (type test)	Yes; 707 V DC (type test)
Potential separation digital outputs		
• between the channels and backplane bus	Yes; 4 200 V DC (type test)	Yes; 707 V DC (type test)
Degree and class of protection		
IP degree of protection	IP20	IP20

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Technical specifications (continued)

Article number	6AG1223-5PH50-7XB0 SIPLUS S7-1200 SM1223 8DI / 8DQ RLY	6AG1223-5BH50-7XB0 SIPLUS S7-1200 SM1223 8DI / 8DQ
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	40 °C; at max. voltages and max. specifications	60 °C; at max. voltages and max. specifications
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method		
required front connector	No	No
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	30 mm	30 mm
Height	125 mm	125 mm
Depth	100 mm	100 mm
Weights		
Weight, approx.	194 g	170 g

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Overview



- Analog inputs for SIMATIC S7-1200
- With extremely short conversion times
- For the connection of analog sensors without additional amplifiers

Selection and ordering data

SM 1231 analog input signal module	
SIMATIC S7-1200 G2, SM 1231 analog input module, 8 AI Inputs: 8 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA)	**6ES7231-4HF50-0XB0**

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Technical specifications

Article number	6ES7231-4HF50-0XB0 SM 1231 Analog Input, 8AI
General information	
Product type designation	SM 1231, AI 8x 14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	45 mA
from backplane bus 5 V DC, typ.	75 mA
Analog inputs	
Number of analog inputs	8; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	1.25 ms; at 400 Hz rejection
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	13 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -20 °C to 60 °C ±0.2 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode voltage, max.	12 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes
Degree and class of protection	
IP degree of protection	IP20

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Technical specifications (continued)

Article number	6ES7231-4HF50-0XB0 SM 1231 Analog Input, 8AI
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	40 °C; at max. voltages and max. specifications
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	175 g

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Overview



- Analog input for SIMATIC S7-1200 G2
- With extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2, SB 1231 analog input module, 4 AI Inputs: 4 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA)	**6ES7231-4HD50-0XB0**

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Technical specifications

Article number	6ES7231-4HD50-0XB0 SB 1231 Signal Board, 4AI
General information	
Product type designation	SB 1231, AI 4x 14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	30 mA
from backplane bus 5 V DC, typ.	28 mA
Analog inputs	
Number of analog inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	0.625 ms; at 400 Hz rejection
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	13 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -20 °C to 60 °C ±0.2 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode voltage, max.	12 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes

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Technical specifications (continued)

Article number	6ES7231-4HD50-0XB0 SB 1231 Signal Board, 4AI
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	40 °C; at max. voltages and max. specifications
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm
Weights	
Weight, approx.	30 g

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Overview



- Analog outputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

Selection and ordering data

SIMATIC S7-1200 G2, SM 1232 analog output module, 8 AO Outputs: 8 x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6ES7232-4HF50-0XB0**

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Technical specifications

Article number	6ES7232-4HF50-0XB0 SM 1232 Analog Output, 8AQ
General information	
Product type designation	SM 1232, AQ 8x 14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	45 mA
from backplane bus 5 V DC, typ.	90 mA
Analog outputs	
Number of analog outputs	8; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit
Errors/accuracies	
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -20 °C to 60 °C ±0.6 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	40 °C; at max. voltages and max. specifications
Connection method	
required front connector	No

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Technical specifications (continued)

Article number	6ES7232-4HF50-0XB0 SM 1232 Analog Output, 8AQ
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	173 g

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Overview



- Analog outputs for SIMATIC S7-1200
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2, SB 1232 analog output module, 4 AO Outputs: 4 x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6ES7232-4HD50-0XB0**

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Technical specifications

Article number	6ES7232-4HD50-0XB0 SB 1232 Signal Board , 4AQ
General information	
Product type designation	SB 1232, AQ 4x 14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	30 mA
from backplane bus 5 V DC, typ.	25 mA
Analog outputs	
Number of analog outputs	4; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit
Errors/accuracies	
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -20 °C to 60 °C ±0.6 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	40 °C; at max. voltages and max. specifications
Connection method	
required front connector	No

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Technical specifications (continued)

Article number	6ES7232-4HD50-0XB0 SB 1232 Signal Board , 4AQ
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm
Weights	
Weight, approx.	28 g

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Overview



- Analog inputs and outputs for the SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks

Selection and ordering data

SIMATIC S7-1200 G2, SM 1233 analog I/O module, 4 AI/4 AO Inputs: 4 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA); Outputs: 4 x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6ES7233-4HF50-0XB0**

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Technical specifications

Article number	6ES7233-4HF50-0XB0 SM 1233 Analog I/O, 4AI/4AQ
General information	
Product type designation	SM 1233, AI 4x 14 bit/AQ 4x 14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	40 mA
from backplane bus 5 V DC, typ.	80 mA
Analog inputs	
Number of analog inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	0.625 ms; at 400 Hz rejection
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog outputs	
Number of analog outputs	4; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	13 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
• Parameterizable	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit

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Technical specifications (continued)

Article number	6ES7233-4HF50-0XB0 SM 1233 Analog I/O, 4AI/4AQ
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -20 °C to 60 °C ±0.2 % of the full-scale deflection
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -20 °C to 60 °C ±0.6 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode voltage, max.	2 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes
• for status of the outputs	Yes
Potential separation	
Potential separation analog inputs	
• between the channels and the power supply of the electronics	No
Potential separation analog outputs	
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	40 °C; at max. voltages and max. specifications
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	174 g

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Overview



- Analog inputs and outputs for the SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2, SB 1233 analog I/O module, 2 AI/2 AO Inputs: 2 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA), outputs: 2 x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6ES7233-4HD50-0XB0**

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Technical specifications

Article number	6ES7233-4HD50-0XB0 SB 1233 Analog I/O, 2AI/2AQ
General information	
Product type designation	SB 1233, AI 2x 14 bit/AQ 2x 14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	25 mA
from backplane bus 5 V DC, typ.	29 mA
Analog inputs	
Number of analog inputs	2; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	0.625 ms; at 400 Hz rejection
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog outputs	
Number of analog outputs	2; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	13 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
• Parameterizable	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit

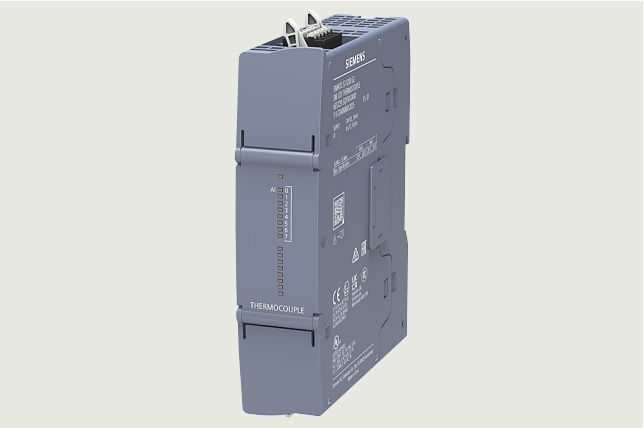
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Technical specifications (continued)

Article number	6ES7233-4HD50-0XB0 SB 1233 Analog I/O, 2AI/2AQ
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -20 °C to 60 °C ±0.2 % of the full-scale deflection
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -20 °C to 60 °C ±0.6 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode voltage, max.	2 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes
• for status of the outputs	Yes
Potential separation	
Potential separation analog inputs	
• between the channels and the power supply of the electronics	No
Potential separation analog outputs	
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	40 °C; at max. voltages and max. specifications
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm
Weights	
Weight, approx.	30 g

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Overview



- For convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant

Selection and ordering data

SM 1231 thermocouple module	
SIMATIC S7-1200 G2, analog input, SM 1231 AI 8xTC 4 AI type J or K thermocouples	**6ES7231-5QF50-0XB0**

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Technical specifications

Article number	6ES7231-5QF50-0XB0 SM 1231 TC, AI 8x TC
General information	
Product type designation	SM 1231, AI 8x16 bit TC
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	15 mA
from backplane bus 5 V DC, typ.	40 mA
Analog inputs	
Number of analog inputs	8; Thermocouples
permissible input voltage for voltage input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	Yes
• Current	No
• Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -80 mV to +80 mV	Yes
Input ranges (rated values), thermocouples	
• type B	Yes
• type C	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type TXK/TXK(L) to GOST	Yes
Thermocouple (TC)	
- Temperature compensation	
- Parameterizable	Yes
Cable length	
• shielded, max.	100 m; to the sensor
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
cold connection point	±1,5 °C
Temperature error (relative to input range), (+/-)	25 °C ±0.05 % / -20 °C to 60 °C ±0.1 % of the full-scale range
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB

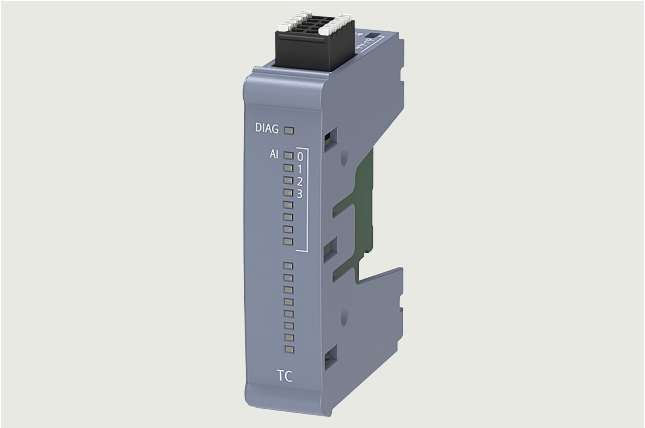
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Technical specifications (continued)

Article number	6ES7231-5QF50-0XB0 SM 1231 TC, AI 8x TC
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes
Potential separation	
Potential separation analog inputs	
• between the channels and the power supply of the electronics	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	171 g

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Overview



- For convenient recording of temperatures with great accuracy
- 4 inputs with 16-bit resolution
- Common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2, analog input, SB 1231 TC AI 4xTC 4 AI type J or K thermocouples	**6ES7231-5QD50-0XB0**

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Technical specifications

Article number	6ES7231-5QD50-0XB0 SB 1231 TC, AI 4x TC
General information	
Product type designation	SB 1231, AI 4x 16-bit TC
Input current	
from backplane bus 5 V DC, typ.	20 mA
Analog inputs	
Number of analog inputs	4; Thermocouples
permissible input voltage for voltage input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	Yes
• Current	No
• Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -80 mV to +80 mV	Yes
Input ranges (rated values), thermocouples	
• type B	Yes
• type C	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type TXK/TXK(L) to GOST	Yes
Thermocouple (TC)	
- Temperature compensation	
- Parameterizable	Yes
Cable length	
• shielded, max.	100 m; to the sensor
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
cold connection point	±1,5 °C
Temperature error (relative to input range), (+/-)	25 °C ±0.05 % / -20 °C to 60 °C ±0.1 % of the full-scale range
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes

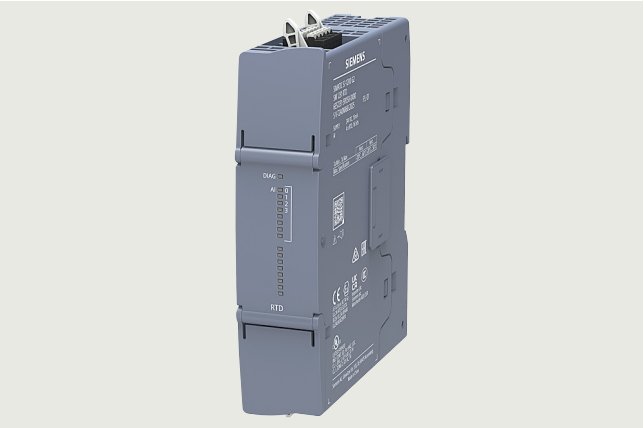
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Technical specifications (continued)

Article number	6ES7231-5QD50-0XB0 SB 1231 TC, AI 4x TC
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm
Weights	
Weight, approx.	29 g

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Overview



- For convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature sensors can be used
- Can easily be retrofitted to existing plant

Selection and ordering data

SIMATIC S7-1200 G2, SM 1231 AI 4xRTD PT100 and PT1000	**6ES7231-5PD50-0XB0**

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Technical specifications

Article number	6ES7231-5PD50-0XB0 SM 1231 RTD, AI 4x RTD
General information	
Product type designation	SM 1231 RTD 4x 16 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	15 mA
from backplane bus 5 V DC, typ.	65 mA
Analog inputs	
Number of analog inputs	4; Resistance thermometer
permissible input voltage for voltage input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	No
• Current	No
• Thermocouple	No
• Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), resistance thermometer	
• Cu 10	Yes
• Ni 100	Yes
• Ni 1000	Yes
• LG-Ni 1000	Yes
• Ni 120	Yes
• Ni 200	Yes
• Ni 500	Yes
• Pt 100	Yes
• Pt 1000	Yes
• Pt 200	Yes
• Pt 500	Yes
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
Cable length	
• shielded, max.	100 m; to the sensor
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -20 °C to 60 °C ±0.2 % of the full-scale deflection
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB

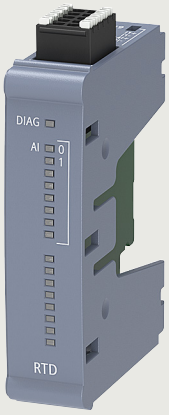
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Technical specifications (continued)

Article number	6ES7231-5PD50-0XB0 SM 1231 RTD, AI 4x RTD
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes
Potential separation	
Potential separation analog inputs	
• between the channels and the power supply of the electronics	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	169 g

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Overview



- For convenient recording of temperatures with great accuracy
- 2 inputs with 16-bit resolution
- Common resistance-type temperature sensors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2, analog input, SB 1231 AI 2xRTD AI 2xRTD, Pt100 and Pt1000	**6ES7231-5PB50-0XB0**

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Technical specifications

Article number	6ES7231-5PB50-0XB0 SB 1231 RTD, AI 2x RTD
General information	
Product type designation	SB 1231, AI 2x 16-bit RTD
Input current	
from backplane bus 5 V DC, typ.	20 mA
Analog inputs	
Number of analog inputs	2; Resistance thermometer
permissible input voltage for voltage input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	No
• Current	No
• Thermocouple	No
• Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), resistance thermometer	
• Cu 10	Yes
• Ni 100	Yes
• Ni 1000	Yes
• LG-Ni 1000	Yes
• Ni 120	Yes
• Ni 200	Yes
• Ni 500	Yes
• Pt 100	Yes
• Pt 1000	Yes
• Pt 200	Yes
• Pt 500	Yes
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
Cable length	
• shielded, max.	100 m; to the sensor
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -20 °C to 60 °C ±0.2 % of the full-scale deflection
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes

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Technical specifications (continued)

Article number	6ES7231-5PB50-0XB0 SB 1231 RTD, AI 2x RTD
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm
Weights	
Weight, approx.	29 g

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Overview



- Analog inputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog sensors without additional amplifiers

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Design

The signal modules have the same design features as the basic devices.

- Installation on DIN rails:
  The modules are snapped onto the rail next to the CPU on the right and are electrically and mechanically connected to each other and to the CPU by the integral slide mechanism.
- Direct installation:
  Horizontal or vertical mounting on DIN rail or direct mounting in the cabinet using integral lugs.

Selection and ordering data

SIPLUS S7-1200 G2: SM1231 8AI With conformal coating -40...+70 °C. Inputs: 8x AI 14-bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA)	**6AG1231-4HF50-7XB0**
SIPLUS S7-1200 G2: SM1231 4AI RTD With conformal coating -40...+70 °C. Pt100 and Pt1000	**6AG1231-5PD50-7XB0**
SIPLUS S7-1200 G2: SM1231 8AI TC With conformal coating -20...+70 °C. AI 8x TC module, type J or K	**6AG1231-5QF50-7XB0**

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Technical specifications

Article number	6AG1231-4HF50-7XB0 SIPLUS S7-1200 SM1231 8AI	6AG1231-5QF50-7XB0 SIPLUS S7-1200 SM1231 8AI TC	6AG1231-5PD50-7XB0 SIPLUS S7-1200 SM1231 4AI RTD
General information			
Product type designation	SM 1231, AI 8x 14 bit	SM 1231, AI 8x16 bit TC	SM 1231 RTD 4x 16 bit
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Input current			
Current consumption, typ.	45 mA	15 mA	15 mA
from backplane bus 5 V DC, typ.	75 mA	40 mA	65 mA
Analog inputs			
Number of analog inputs	8; Current or voltage differential inputs	8; Thermocouples	4; Resistance thermometer
permissible input voltage for voltage input (destruction limit), max.	35 V	±35 V	±35 V
permissible input current for current input (destruction limit), max.	40 mA		
Cycle time (all channels) max.	1.25 ms; at 400 Hz rejection		
Technical unit for temperature measurement adjustable		Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
Input ranges			
• Voltage	Yes; ±10V, ±5V, ±2.5V	Yes	No
• Current	Yes; 4 to 20 mA, 0 to 20 mA	No	No
• Thermocouple	No	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV	No
• Resistance thermometer	No	No	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	No	No	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), voltages			
• -10 V to +10 V	Yes		
• -2.5 V to +2.5 V	Yes		
• -5 V to +5 V	Yes		
• -80 mV to +80 mV		Yes	
Input ranges (rated values), currents			
• 0 to 20 mA	Yes		
• 4 mA to 20 mA	Yes		
Input ranges (rated values), thermocouples			
• type B		Yes	
• type C		Yes	
• Type E		Yes	
• Type J		Yes	
• Type K		Yes	
• Type N		Yes	
• Type R		Yes	
• Type S		Yes	
• Type T		Yes	
• Type TXK/TXK(L) to GOST		Yes	
Input ranges (rated values), resistance thermometer			
• Cu 10			Yes
• Ni 100			Yes
• Ni 1000			Yes
• LG-Ni 1000			Yes
• Ni 120			Yes
• Ni 200			Yes
• Ni 500			Yes
• Pt 100			Yes

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Technical specifications (continued)

Article number	6AG1231-4HF50-7XB0 SIPLUS S7-1200 SM1231 8AI	6AG1231-5QF50-7XB0 SIPLUS S7-1200 SM1231 8AI TC	6AG1231-5PD50-7XB0 SIPLUS S7-1200 SM1231 4AI RTD
• Pt 1000			Yes
• Pt 200			Yes
• Pt 500			Yes
Input ranges (rated values), resistors			
• 0 to 150 ohms			Yes
• 0 to 300 ohms			Yes
• 0 to 600 ohms			Yes
Thermocouple (TC)			
- Temperature compensation			
- Parameterizable		Yes	
Cable length			
• shielded, max.	100 m; shielded, twisted pair	100 m; to the sensor	100 m; to the sensor
Analog value generation for the inputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	13 bit; + sign	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz	85 dB at 10 / 50 / 60 / 400 Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values			
• parameterizable	Yes	Yes	Yes
Errors/accuracies			
cold connection point		±1,5 °C	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -40 °C to 70 °C ±0.3 % of the full-scale deflection	25 °C ±0.05 % / -40 °C to 70 °C ±0.15 % of the full-scale deflection	25 °C ±0.1 % / -40 °C to 70 °C ±0.3 % of the full-scale deflection
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)		0.05 %	0.05 %
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	0.1 %		
• Current, relative to input range, (+/-)	0.1 %		
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Common mode voltage, max.	12 V		
• Common mode interference, min.		120 dB	120 dB
Interrupts/diagnostics/status information			
Alarms		Yes	Yes
Diagnostics function	Yes	Yes; Can be read out	Yes; Can be read out
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes
Diagnostics indication LED			
• DIAG LED	Yes	Yes	Yes
• for status of the inputs	Yes	Yes	Yes
Potential separation			
Potential separation analog inputs			
• between the channels and the power supply of the electronics		Yes	Yes
Degree and class of protection			
IP degree of protection	IP20	IP20	IP20

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Technical specifications (continued)

Article number	6AG1231-4HF50-7XB0 SIPLUS S7-1200 SM1231 8AI	6AG1231-5QF50-7XB0 SIPLUS S7-1200 SM1231 8AI TC	6AG1231-5PD50-7XB0 SIPLUS S7-1200 SM1231 4AI RTD
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C	-20 °C	-40 °C
• max.	60 °C; at max. voltages and max. specifications	60 °C; at max. voltages and max. specifications	60 °C; at max. voltages and max. specifications
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method			
required front connector	No	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• Plastic	Yes	Yes	Yes
Dimensions			
Width	30 mm	30 mm	30 mm
Height	125 mm	125 mm	125 mm
Depth	100 mm	100 mm	100 mm
Weights			
Weight, approx.	175 g	171 g	169 g

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Overview



- Analog outputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Design

The signal modules have the same design features as the basic devices.

- Installation on DIN rails:
  The modules are snapped onto the rail next to the CPU on the right and are electrically and mechanically connected to each other and to the CPU by the integral slide mechanism.
- Direct installation:
  Horizontal or vertical mounting on DIN rail or direct mounting in the cabinet using integral lugs.

Selection and ordering data

SIPLUS S7-1200 G2: SM1232 8AQ With conformal coating -40...+70 °C. Outputs: 8x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6AG1232-4HF50-7XB0**

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Technical specifications

Article number	6AG1232-4HF50-7XB0 SIPLUS S7-1200 SM1232 8AQ
General information	
Product type designation	SM 1232, AQ 8x 14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	45 mA
from backplane bus 5 V DC, typ.	90 mA
Analog outputs	
Number of analog outputs	8; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit
Errors/accuracies	
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -40 °C to 70 °C ±0.85 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20

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Technical specifications (continued)

Article number	6AG1232-4HF50-7XB0 SIPLUS S7-1200 SM1232 8AQ
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	40 °C; at max. voltages and max. specifications
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	173 g

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Overview



- Analog inputs and outputs for the SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Design

The SM 1233 analog input/output signal modules have the same design features as the basic devices.

- Installation on DIN rails:
  The modules are snapped onto the rail next to the CPU on the right and are electrically and mechanically connected to each other and to the CPU by the integral slide mechanism.
- Direct installation:
  Horizontal or vertical mounting on DIN rail or direct mounting in the cabinet using integral lugs.

Selection and ordering data

SIPLUS S7-1200 G2: SM1233 4AI / 4AQ With conformal coating -40...+70 °C. Inputs: 4x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA); outputs: 4x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)	**6AG1233-4HF50-7XB0**

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Technical specifications

Article number	6AG1233-4HF50-7XB0 SIPLUS S7-1200 SM1233 4AI / 4AQ
General information	
Product type designation	SM 1233, AI 4x 14 bit/AQ 4x 14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	40 mA
from backplane bus 5 V DC, typ.	80 mA
Analog inputs	
Number of analog inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	0.625 ms; at 400 Hz rejection
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog outputs	
Number of analog outputs	4; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	13 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
• parameterizable	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit

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Technical specifications (continued)

Article number	6AG1233-4HF50-7XB0 SIPLUS S7-1200 SM1233 4AI / 4AQ
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -40 °C to 70 °C ±0.3 % of the full-scale deflection
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -40 °C to 70 °C ±0.85 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode voltage, max.	2 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes
• for status of the outputs	Yes
Potential separation	
Potential separation analog inputs	
• between the channels and the power supply of the electronics	No
Potential separation analog outputs	
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	40 °C; at max. voltages and max. specifications
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability

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Technical specifications (continued)

Article number	6AG1233-4HF50-7XB0 SIPLUS S7-1200 SM1233 4AI / 4AQ
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	174 g

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Overview

- Simulator module for program testing during commissioning and ongoing operation
- Simulation of 8 or 14 inputs

Selection and ordering data

SIMATIC S7-1200 G2, SIM 1274 simulator module, for CPU 1212 8 input switches 24 V DC	**6ES7274-1XF50-0XA0**
SIMATIC S7-1200, SIM 1274 simulator module, for CPU 1214 14 input switches 24 V DC	**6ES7274-1XH50-0XA0**

Technical specifications

Article number	6ES7274-1XF50-0XA0	6ES7274-1XH50-0XA0
	S7-1200 G2 Simulator SIM1274, 8 DI	S7-1200 G2 Simulator SIM1274, 14 DI
General information		
Product type designation	SIM 1274, 8DI	SIM 1274, 14 DI
Digital inputs		
Number of digital inputs	8	14
Digital outputs		
Number of digital outputs	0	0

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Overview

- Battery board for extending the power reserve for the S7-1200 G2 real-time clock

Selection and ordering data

SIMATIC S7-1200 G2, BB 1297 battery board For long-term buffering of the real-time clock, pluggable in the signal board slot of the S7-1200 G2 CPU; battery (CR2032) not included in scope of supply	**6ES7297-4AX50-0XA0**

Technical specifications

Article number	6ES7297-4AX50-0XA0 BB 1297 Battery Board CPU S7-1200 G2
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostics indication LED	
• for maintenance	Yes; The maintenance LED (MAINT) of the PLC signals that the battery needs to be replaced.
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm
Weights	
Weight, approx.	26 g

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Overview

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU, 3964(R)
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

Selection and ordering data

SIMATIC S7-1200 G2 CM 1241 Communication Module Interfaces: RS232/422/485, with push-in terminal block	**6ES7241-1EA50-0XB0**
Accessories	
SIMATIC S7-1200, spare part front flaps communication modules (Communication module front flap bottom & top) 4 units each	**6ES7291-1CC30-0XA0**

Technical specifications

Article number	**6ES7241-1EA50-0XB0** **CM 1241 Comm Module, RS232/422/485**
General information	
Product type designation	CM 1241 RS 232 / 422 / 485
Input current	
from backplane bus 5 V DC, typ.	170 mA
Interfaces	
Interfaces/bus type	RS 232 (full duplex) / 422 / 485
Number of interfaces	1
Point-to-point connection	
• Cable length, max.	1 000 m; RS 232 10 m shielded max., RS 422/485 1 000 m shielded max.
- Integrated protocol driver	
- Freeport	Yes
- ASCII	Yes; Available as library function
- Modbus RTU master	Yes
- Modbus RTU device	Yes
- USS	Yes; Available as library function
Interface types	
RS 232	
• Transmission rate, max.	115.2 kbit/s
RS 485	
• Transmission rate, max.	250 kbit/s
Protocols	
Integrated protocols	
- Freeport	
- Telegram length, max.	4 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	no parity (standard); even, odd, mark (parity bit always 1); space (parity bit always 0)
- Modbus RTU master	
- Address area	1 through 65535 (Standard Modbus addressing)
- max. number of devices	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
- Modbus RTU device	
- Address area	1 through 65535 (Standard Modbus addressing)
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20

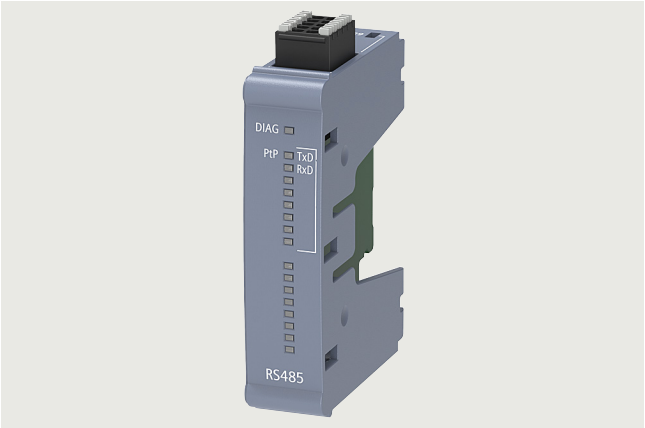
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Technical specifications (continued)

Article number	6ES7241-1EA50-0XB0 CM 1241 Comm Module, RS232/422/485
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	178 g

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Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

Selection and ordering data

SIMATIC S7-1200 G2 CB 1241 Communication Board Interface: RS485, with push-in terminal block	**6ES7241-1CA50-0XB0**
Accessories	
SIMATIC S7-1200, spare part, gold-plated I/O terminal block signal board (4 units with 6 screws each)	**6ES7292-1BF30-0XA0**

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Technical specifications

Article number	6ES7241-1CA50-0XB0 CB 1241 Comm Board, RS485
General information	
Product type designation	CB 1241 RS 485
Input current	
from backplane bus 5 V DC, typ.	75 mA
Interfaces	
Interfaces/bus type	RS 485
Number of interfaces	1
Point-to-point connection	
• Cable length, max.	1 000 m
- Integrated protocol driver	
- Freeport	Yes
- ASCII	Yes; Available as library function
- Modbus RTU master	Yes
- Modbus RTU device	Yes
- USS	Yes; Available as library function
Interface types	
RS 485	
• Transmission rate, max.	250 kbit/s
Protocols	
Integrated protocols	
- Freeport	
- Telegram length, max.	4 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	no parity (standard); even, odd, mark (parity bit always 1); space (parity bit always 0)
- Modbus RTU master	
- Address area	1 through 65535 (Standard Modbus addressing)
- max. number of devices	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
- Modbus RTU device	
- Address area	1 through 65535 (Standard Modbus addressing)
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the outputs	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	15 mm
Height	62 mm
Depth	63 mm

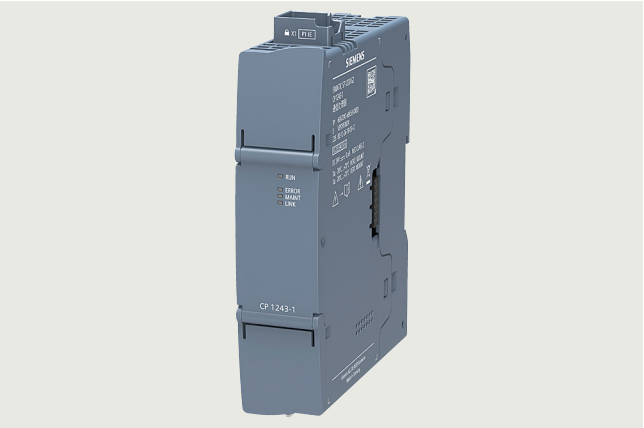
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Technical specifications (continued)

Article number	6ES7241-1CA50-0XB0 CB 1241 Comm Board, RS485
Weights	
Weight, approx.	29 g

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Overview



The CP 1243-1 offers an additional communications interface (with one port) for the SIMATIC S7-1200 G2 system, thus expanding the communication capabilities of the new controller generation. An S7-1200 G2 station can thus be integrated into different networks or used as a remote terminal unit in telecontrol applications. The CP has the following necessary functions and characteristics:

- Additional Industrial Ethernet interface with one port. Up to 3 communications processors can be operated on one CPU
- Wide range of communication options: S7/HMI communication, S7/HMI routing, PG/OP communication, Open User Communication (TCP/IP, UDP, ISO-on-TCP)
- **Web server access:** Access to CPU web server via the CP for station information, status and diagnostics
- **IPv6 support:** Future-proof network integration using IPv6
- Industrial Remote Communication – Support of the DNP3 protocol for telecontrol applications
- Data transfer of measured values, control variables or alarms optimized for telecontrol systems
- Data buffering of up to 64,000 values ensures a secure database even in the event of temporary connection failures
- **Email function:** Simple configuration of event-controlled alarms for quick notification in case of problems
- Compact industrial enclosure in S7-1200 design for mounting on a DIN mounting rail
- Fast commissioning thanks to easy configuration using STEP 7

Selection and ordering data

	Article No.
CP 1243-1 communications processor	
Communications processor CP 1243-1 for connecting SIMATIC S7-1200 G2 as an additional Ethernet interface and for connection to control centers via telecontrol protocols (DNP3, IEC 60870, TeleControl Basic), security (firewall, VPN)	**6GK7243-1BX50-0XE0**

Accessories

	Article No.
CSM 1277 compact switch module	
Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic equipment manual on CD-ROM	**6GK7277-1AA10-0AA0**
IE FC RJ45 plugs	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180	
180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2 x 2 (type A)	
4-core, shielded TP installation cable for connection to IE FC RJ45 outlet/IE F RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC stripping tool	
Preset stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

Note:
For more information on the Software Update Service, see chapter 11.

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Technical specifications

Article number	6GK7243-1BX50-0XE0
product type designation	CP 1243-1
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7243-1BX50-0XE0
transfer rate	
transfer rate	
• at the 1st interface	100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
• for power supply	1
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	19.2 ... 28.8 V
consumed current	
• from external supply voltage at DC at 24 V typical	0.1 A
power loss [W]	2.5 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
width	30 mm
height	134 mm
depth	100 mm
net weight	0.18 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
• wall mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	3
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	40
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	40

Technical specifications (continued)

Article number	6GK7243-1BX50-0XE0
product type designation	CP 1243-1
performance data IT functions	
number of possible connections	
• as email client maximum	1
performance data telecontrol	
suitability for use	
• substation	Yes
protocol is supported	
• DNP3	Yes
product function data buffering if connection is aborted	Yes
number of data points per device maximum	500
product functions management, configuration, engineering	
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
product function is supported identification link	Yes
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1200 G2 CPU
product functions time	
protocol is supported	
• NTP	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability RoHS conformity	Yes

More information

Technical requirements/compatibility

An S7-1200 G2 CPU with firmware version 4.1 is required to operate the CP 1243-1.

CP 1243-1 can be configured with STEP 7 Basic/Professional V21.1 (TIA Portal) or higher.

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Overview

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU, 3964(R)
- Additional protocols can also be loaded
- Easy parameterization with STEP 7 Basic

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIMATIC S7-1200 G2 CM 1241 Communications Module Interfaces: RS232/422/485, with push-in terminal block	**6AG1241-1EA50-7XB0**
Accessories	
SIMATIC S7-1200, spare part front flaps communications modules (Communications module front flap bottom & top) 4 units each	**6ES7291-1CC30-0XA0**

Technical specifications

Article number	6AG1241-1EA50-7XB0 SIPLUS S7-1200 CM RS232/422/485
General information	
Product type designation	CM 1241 RS 232 / 422 / 485
Input current	
from backplane bus 5 V DC, typ.	170 mA
Interfaces	
Interfaces/bus type	RS 232 (full duplex) / 422 / 485
Number of interfaces	1
Point-to-point connection	
• Cable length, max.	1 000 m; RS 232 10 m shielded max., RS 422/485 1 000 m shielded max.
- Integrated protocol driver	
- Freeport	Yes
- ASCII	Yes; Available as library function
- Modbus RTU master	Yes
- Modbus RTU device	Yes
- USS	Yes; Available as library function
Interface types	
RS 232	
• Transmission rate, max.	115.2 kbit/s
RS 485	
• Transmission rate, max.	250 kbit/s
Protocols	
Integrated protocols	
- Freeport	
- Telegram length, max.	4 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	no parity (standard); even, odd, mark (parity bit always 1); space (parity bit always 0)
- Modbus RTU master	
- Address area	1 through 65535 (Standard Modbus addressing)
- max. number of devices	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
- Modbus RTU device	
- Address area	1 through 65535 (Standard Modbus addressing)
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the outputs	Yes

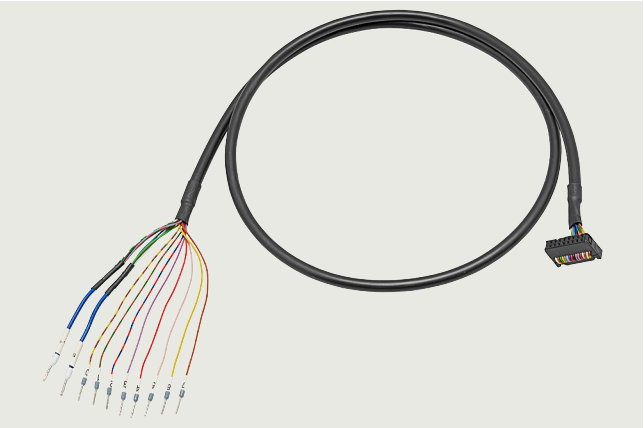
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Technical specifications (continued)

Article number	6AG1241-1EA50-7XB0 SIPLUS S7-1200 CM RS232/422/485
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C; at max. voltages and max. specifications
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	178 g

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Overview



SIMATIC TOP connect universal connecting cable

The wiring of the

- SIMATIC S7-1500 IO (25 mm)
- SIMATIC ET 200SP
- SIMATIC S7-1200
- LOGO!

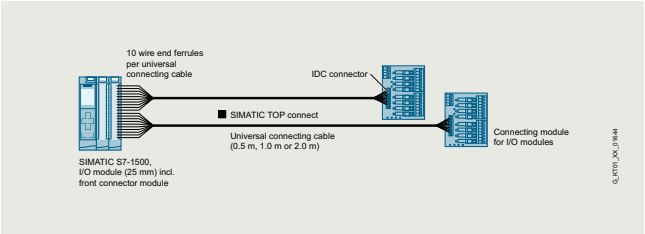
with the sensors/actuators is a significant factor with respect to time/cost overhead during configuration, control cabinet design, procurement and ease of servicing. The SIMATIC TOP connect system cabling makes connection easy, fast and secure.

Design

The unshielded universal connection cable is offered for a wide range of control cabinet concepts.

It comprises:

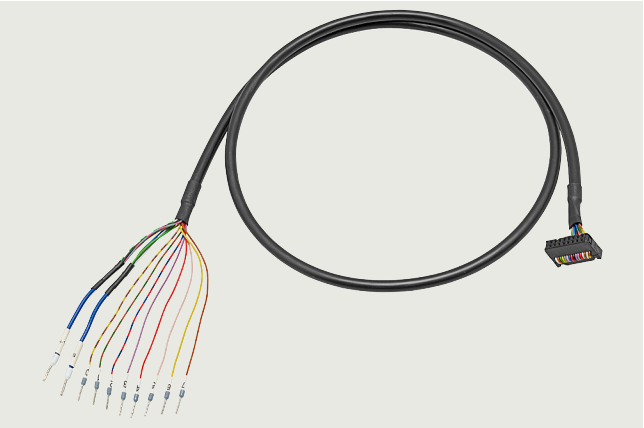
- 16-pin round cable with a core cross-section of 0.14 mm^2, pre-assembled with wire end ferrules for connection to the controller:
  - Labeled with "0" ... "7" for the control inputs/outputs
  - Labeled with "M" for mass
  - Labeled with "L+" for 24 V DC potential
- 16-pin ID (insulation displacement) connector for connection to the SIMATIC TOP connect connection modules for 8 I/Os:
  - 3-wire connection using the appropriate connection module for quick, error-free wiring
  - Galvanic isolation and adaptation using a coupling relay for easy implementation of potential groups in the system
  - High output current (up to 4 A), even for higher switching frequencies, using an optocoupler module (overload and short-circuit proof)
  - Implementation of isolating terminals using switch modules enabling individual signals to be measured
  - Channel-wise protection of I/Os using a fuse module with a thermal fuse



SIMATIC TOP connect universal connection cable

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Overview



SIMATIC TOP connect universal connecting cable

The universal connecting cable constitutes the link between the standard connection of the SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 or LOGO! and the SIMATIC TOP connect terminal module. It transmits 8 signals and the supply voltage. The connecting cable is available in lengths of 0.5 m / 1.0 m / 2.0 m. the maximum technically feasible length is 30 m.

Selection and ordering data

Designation	Article No.
Universal connecting cables for SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 and LOGO!	
16 x 0.14 mm² unshielded	
• 0.5 m	**6ES7923-0BA50-0FB0**
• 1.0 m	**6ES7923-0BB00-0FB0**
• 2.0 m	**6ES7923-0BC00-0FB0**

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Overview

The connection modules are used instead of conventional terminal blocks and act as the interface between the PLC and signals from the field. All digital modules with 8 I/Os can be used.

Selection and ordering data

TP1 connection module	
For 1-conductor connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0AA20-0BA0**
TP3 connection module	
For 3-conductor connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0CA20-0BA0**
• Push-in terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BC0**
• Screw-type terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BA0**
• Push-in terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BA0**
TPRo connection module	
Relay module for 8 outputs, relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BD20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BD20-0BA0**
TPRi connection module	
Relay module for 8 inputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
TPRi connection module	
Relay module for 8 inputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**
TPOo connection module	
Optocoupler module for 8 outputs (max. 24 V DC/4 A)	
• Push-in terminals with LEDs	**6ES7924-0BF20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BF20-0BA0**

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Overview



- Digital inputs and outputs as supplement to the integrated I/O of the fail-safe CPUs
- Integrated into the overall automation for implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

Selection and ordering data

SIMATIC S7-1200 G2, digital I/O, SM 1226 F-DI 4x / F-DQ 2x 2A PPM / DI 2x, 24VDC, up to PL E (ISO 13849-1) / SIL3 (IEC 61508)	**6ES7226-6ME50-0XB0**
Accessories	
Terminal block (spare part)	
SIMATIC S7-1200 G2, spare part, tin-coated I/O terminal block For push-in connection	**6ES7292-2AK50-0XA0**
Front flap set (spare part)	
SIMATIC S7-1200 G2, replacement cover flaps Signal Modules 30 mm, one pair per set	**6ES7291-1BA50-0XA0**
STEP 7 Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2 **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Basic V21, floating license Engineering software in the TIA Portal; software Class A; engineering software in the TIA Portal; software, documentation and license key on USB flash drive; for configuring SIMATIC S7-1200; SIMATIC S7-1200 G2 (incl. Safety); SIMATIC Basic Panels; SIMATIC Unified Basic Panels; content: 1x USB	**6ES7822-0AA25-0YA5**
SIMATIC STEP 7 Basic V21, floating license download[1] Engineering software in the TIA Portal; software Class A; software, documentation and license key for download; for configuring SIMATIC S7-1200; SIMATIC S7-1200 G2 (incl. Safety); SIMATIC Basic Panels; SIMATIC Unified Basic Panels Consignee email address required for delivery	**6ES7822-0AE25-0YA5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7226-6ME50-0XB0 Digital I/O SM1226, F-DI 4/F-DQ 2/DI 2
General information	
Product type designation	SM 1226, F-DI 4x 24 V DC, F-DQ 2x 24 V DC, DI 2x 24 V DC
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
from backplane bus 5 V DC, max.	80 mA
Digital inputs	
• from load voltage L+ (without load), max.	42 mA; 1L+ plus 6 mA / input used plus any VS0 to VS3 current used
Digital outputs	
• from load voltage L+, max.	45 mA; 2L+ plus load current for all P-switch outputs
Digital inputs	
Number of digital inputs	6; 4 fail-safe inputs: 2 (1oo2), 4 (1oo1), or a mix; 2 standard inputs
• in groups of	6
Sourcing/sinking input	No
Input characteristic curve in accordance with IEC 61131, type 1	Yes; Current-sinking
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+15 to +30 V
Input current	
• for signal "0", max. (permissible quiescent current)	0.5 mA
• for signal "1", min.	2.5 mA
• for signal "1", typ.	4 mA; 6 mA maximum
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; Fail-safe: 0.8 / 1.6 / 3.2 / 6.4 / and 12.8 ms (selectable individually) Standard: 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / and 12.8 ms (selectable together)
Digital outputs	
Number of digital outputs	2
• in groups of	2
Short-circuit protection	Yes; per channel, electronic
Open-circuit detection	Yes; per channel, only detects when output is off with PM load that allows small negative current
Overload protection	Yes; per channel
Limitation of inductive shutdown voltage to	Typ. -74 V (typ. -26 V P-switch; typ. +48 V M-switch)
Controlling a digital input	Yes; Only permitted in PP mode, not with PM mode
Switching capacity of the outputs	
• on lamp load, max.	10 W
Output voltage	
• Rated value (DC)	24 V
• for signal "1", min.	2L+ (-2.0 V); P-switch: 2L+ (-1.5 V); M-switch: 0.5 V
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA; P-switch or M-switch
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz

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Technical specifications (continued)

Article number	6ES7226-6ME50-0XB0 Digital I/O SM1226, F-DI 4/F-DQ 2/DI 2
Interrupts/diagnostics/status information	
Diagnostics function	Yes; available for the module and failsafe I/O only; not supported for standard inputs
Diagnostics indication LED	
• DIAG LED	Yes
• for status of the inputs	Yes
• for status of the outputs	Yes
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes
Potential separation digital outputs	
• between the channels and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	180 g

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Overview



The design and functionality of the SIMATIC PM 1207 one-phase load current supplies (PM = power module) are optimally matched to the SIMATIC S7-1200 G2 controllers. They provide the supply to CPUs with 24 V input as well as to signal modules, and to 24 V loads connected to the modules. Comprehensive certifications such as UL and DNV GL enable universal use.

Selection and ordering data

SIMATIC S7-1200 PM 1207 Input: 120 ... 240 V AC/DC Output: 24 V DC/5.0 A	**6EP3333-4SB00-3AX0**
SIMATIC S7-1200 PM 1207 Input: 120 ... 240 V AC/DC Output: 24 V DC/5.0 A	**6EP3333-4SC00-3AX0**

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Technical specifications

Article number	6EP3333-4SB00-3AX0	6EP3333-4SC00-3AX0
product brand name	SIMATIC	SIMATIC
type of current supply	24 V/5 A	24 V/5 A
General information		
Technical Product Detail Page	https://i.siemens.com/1P6EP3333-4SB00-3AX0	https://i.siemens.com/1P6EP3333-4SC00-3AX0
input		
type of the power supply network	1-phase AC or DC	1-phase AC or DC
supply voltage at AC		
• minimum rated value	120 V	120 V
• maximum rated value	240 V	240 V
• initial value	85 V	85 V
• full-scale value	264 V	264 V
supply voltage at DC	120 ... 240 V	120 ... 240 V
input voltage at DC	99 ... 275 V	99 ... 275 V
wide range input	Yes	Yes
overvoltage overload capability	300 V AC for 30 s	300 V AC for 30 s
buffering time for rated value of the output current in the event of power failure minimum	20 ms	20 ms
operating condition of the mains buffering	at Vin = 120/240 V	at Vin = 120/240 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	47 ... 63 Hz	47 ... 63 Hz
input current		
• at rated input voltage 120 V	1.9 A	1.9 A
• at rated input voltage 240 V	1.1 A	1.1 A
input current		
• at rated input voltage 120 V AC	1.8 A	1.8 A
• at rated input voltage 120 V DC	1.1 A	1.1 A
• at rated input voltage 240 V AC	1 A	1 A
• at rated input voltage 240 V DC	0.6 A	0.6 A
current limitation of inrush current at 25 °C maximum	45 A	45 A
I2t value maximum	1.8 $A^2 \cdot s$	1.8 $A^2 \cdot s$
fuse protection type	internal	internal
fuse protection type in the feeder	recommended miniature circuit breaker: 16 A characteristic B/C for UL489-listed/Cat. Div. Q	recommended miniature circuit breaker: 16 A characteristic B/C for UL489-listed/Cat. Div. Q
output		
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
number of outputs	1	1
output voltage at DC rated value	24 V	24 V
output voltage		
• at output 1 at DC rated value	24 V	24 V
	24 V	24 V
output voltage adjustable	No	No
relative overall tolerance of the voltage	1.5 %	1.5 %
relative control precision of the output voltage		
• on slow fluctuation of input voltage	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.2 %	0.2 %
residual ripple		
• maximum	150 mV	150 mV
voltage peak		
• maximum	240 mV	240 mV
display version for normal operation	Green LED for 24 V OK	Green LED for 24 V OK
behavior of the output voltage when switching on	Overshoot of Vout < 1 %	Overshoot of Vout < 1 %
response delay maximum	2 s	2 s
voltage increase time of the output voltage		

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Technical specifications (continued)

Article number	6EP3333-4SB00-3AX0	6EP3333-4SC00-3AX0
product brand name	SIMATIC	SIMATIC
type of current supply	24 V/5 A	24 V/5 A
• typical	220 ms	220 ms
output current		
• rated value	5 A	5 A
• rated range	0 ... 5 A; 6 A up to +45°C; +60 ... +70 °C: Derating 3%/K	0 ... 5 A; 6 A up to +45°C; +60 ... +70 °C: Derating 3%/K
	5 A	5 A
supplied active power typical	120 W	120 W
short-term overload current		
• on short-circuiting during the start-up typical	6 A	6 A
• at short-circuit during operation typical	6 A	6 A
bridging of equipment	Yes	Yes
number of parallel-switched equipment resources	2	2
efficiency		
efficiency in percent	88 %	88 %
power loss [W]		
• at rated output voltage for rated value of the output current typical	15 W	15 W
• during no-load operation maximum	3 W	3 W
closed-loop control		
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	1.5 %	1.5 %
setting time		
• load step 10 to 90% typical	1 ms	1 ms
• load step 90 to 10% typical	1 ms	1 ms
• maximum	1 ms	1 ms
protection and monitoring		
design of the overvoltage protection	< 33 V	< 33 V
property of the output short-circuit proof	Yes	Yes
design of short-circuit protection	Constant current characteristic	Constant current characteristic
response value current limitation	5.5 A	5.5 A
interfaces		
product function communication function	Yes	Yes
design of the interface	unidirectional, can only send data to the higher-level control and analysis system	unidirectional, can only send data to the higher-level control and analysis system
safety		
galvanic isolation between input and output	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class I	Class I
leakage current		
• maximum	3.5 mA	3.5 mA
protection class IP	IP20	IP20
EMC		
standard		
• for emitted interference	EN 55032	EN 55032
• for mains harmonics limitation	EN 61000-3-2	EN 61000-3-2
• for interference immunity	EN 61000-6-2	EN 61000-6-2

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Technical specifications (continued)

Article number	6EP3333-4SB00-3AX0	6EP3333-4SC00-3AX0
product brand name	SIMATIC	SIMATIC
type of current supply	24 V/5 A	24 V/5 A
standards, specifications, approvals		
certificate of suitability		
• CE marking	Yes	Yes
• UL approval	Yes; cULus-listed (UL 61010, CSA C22.2 No. 107.1), File E143289	Yes; cULus-listed (UL 61010, CSA C22.2 No. 107.1), File E143289
• UKCA marking	Yes	Yes
• EAC approval	Yes	Yes
• Regulatory Compliance Mark (RCM)	Yes	Yes
• CCC approval		Yes
type of certification		
• CB-certificate	Yes	Yes
standards, specifications, approvals hazardous environments		
certificate of suitability		
• IECEx	No	Yes; IECEx II 3G Ex ec IIC (T3 / T4)* Gc (* -25°C ≤ Tamb ≤ 55°C T4 and -25°C ≤ Tamb ≤ 70°C T3)
• ATEX		Yes; ATEX (EX) II 3G Ex ec IIC (T3 / T4)* Gc (* -25°C ≤ Tamb ≤ 55°C T4 and -25°C ≤ Tamb ≤ 70°C T3)
• ULhazloc approval	No	Yes; Class I, Div. 2, Group ABCD, Tx (T4... T3), File E330455
• UKEX		Yes
• CCC for hazardous zone according to GB standard		available soon
standards, specifications, approvals marine classification		
shipbuilding approval	Yes	Yes
Marine classification association		
• Det Norske Veritas (DNV)	Yes	Yes
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	419.1 kg	419.1 kg
• during manufacturing	8.5 kg	8.5 kg
• during operation	410.3 kg	410.3 kg
• after end of life	0.31 kg	0.31 kg
ambient conditions		
ambient temperature		
• during operation	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection
• in horizontal mounting position during operation	-25 ... +70 °C	-25 ... +70 °C
• in vertical mounting position during operation	-25 ... +40 °C	-25 ... +40 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
connection method		
type of electrical connection	push-in terminal block can be removed	push-in terminal block can be removed
• at input	L, N, PE: 1 push-in terminal can be removed as terminal block for 0.5 ... 2.5 mm²	L, N, PE: 1 push-in terminal can be removed as terminal block for 0.5 ... 2.5 mm²
• at output	L+, M: 2 push-in terminals can be removed as terminal block for 0.5 ... 2.5 mm²	L+, M: 2 push-in terminals can be removed as terminal block for 0.5 ... 2.5 mm²
removable terminal at input	Yes	Yes
removable terminal at output	Yes	Yes
design of the interface for communication	13, 14 (contacts): 1 push-in terminal can be removed as terminal block for 0.2 ... 1.5 mm²	13, 14 (contacts): 1 push-in terminal can be removed as terminal block for 0.2 ... 1.5 mm²

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Technical specifications (continued)

Article number	6EP3333-4SB00-3AX0	6EP3333-4SC00-3AX0
product brand name	SIMATIC	SIMATIC
type of current supply	24 V/5 A	24 V/5 A
mechanical data		
width × height × depth of the enclosure	70 mm × 125 mm × 100 mm	70 mm × 125 mm × 100 mm
installation width × mounting height	70 mm × 175 mm	70 mm × 175 mm
required spacing		
• top	25 mm	25 mm
• bottom	25 mm	25 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting
• DIN-rail mounting	Yes	Yes
• S7 rail mounting	No	No
• wall mounting	Yes	Yes
housing can be lined up	Yes	Yes
net weight	0.45 kg	0.45 kg
further information internet links		
internet link		
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
identification link	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
additional information		
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



With its extended ambient conditions, the SIMATIC S7-1500 can be used almost anywhere. Many controllers can be operated in a temperature range from -30 °C to +60 °C and at altitudes up to 5,000 m as standard. A wide range of SIPLUS Controllers is available for requirements beyond this.

The SIMATIC S7-1500 is

- a modular, scalable, and universally usable system in degree of protection IP20
- the system solution for a variety of automation applications in discrete automation
- maximum performance combined with excellent usability
- configurable in the Totally Integrated Automation Portal with STEP 7 Professional V12 or higher

Performance

- Increase in performance through
  - Faster command execution
  - Language extensions
  - New data types
  - Faster backplane bus
  - Optimized code generation
- High-performance communication:
  - PROFINET IO (2-port switch) as standard interface; from CPU 1515-2 PN, one or more additional integrated PROFINET interfaces, e.g. for network separation, for connecting further PROFINET devices or for high-speed communication as an I-device
  - OPC UA Server (Data Access) and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems
  - Expandable with communications modules for bus systems and point-to-point connection

Overview (continued)

Integrated technology

- Motion Control integrated without additional modules:
  - Standardized blocks (PLCopen) for connection of analog and PROFIdrive-capable drives
  - The Motion Control functionality supports speed axes, positioning axes, relative synchronous operation (synchronizing without specification of the synchronized position), as well as external encoders, output cams and probes.
  - Extended Motion Control functions such as velocity gearing, absolute synchronous operation (synchronizing with specification of the synchronized position), camming and functions for controlling kinematics are also integrated in the technology CPUs.
- Comprehensive trace functions for all CPU tags for real-time diagnostics and sporadic error detection; for effective commissioning and quick optimization of drives and controls
- Comprehensive control functionalities: e.g. easily configurable blocks for automatic optimization of the control parameters for optimum control quality
- Additional functions through available technology modules: e.g. high-speed counting, position detection, or measurement functions for signals up to 1 MHz

Safety Integrated

- Protection of personnel and machinery – within the framework of an integrated complete system
- Fail-safe SIMATIC S7-1500(T)F Controllers for processing standard and safety programs on the same controller. The fail-safe and standard user programs are created in the TIA Portal with the same editors; fail-safe data, for example, can therefore be evaluated like standard data in the standard user program. Due to this integration, the system benefits and the comprehensive functionality of SIMATIC are also available for fail-safe applications.

Redundant systems

- Redundant S7-1500R/H CPUs for applications where availability of the PLC is crucial.
- Both CPUs are connected with the I/O stations via a PROFINET IO ring. Synchronization for the S7-1500R is via this ring, or via separate FOC synchronization cables for the S7-1500H. In the event of a CPU failure, the back-up CPU automatically assumes control of the process. No data is lost and the process can be continued extremely quickly. The PROFINET IO ring ensures that all nodes remain accessible in the event of a fieldbus interruption.
- The engineering corresponds to that of a standard CPU. The TIA Portal and redundant CPUs handle the synchronization of the programs and data. All without any additional overhead for the user.

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Overview (continued)

Security Integrated

- Password-based know-how protection against unauthorized read-out and modification of program blocks
- Copy protection for greater protection against unauthorized copying of program blocks:
  With copy protection, individual blocks on the SIMATIC Memory Card can be tied to its serial number so that the block can only be run if the configured memory card is inserted into the CPU.
- Rights concept with four different authorization levels:
  Different access rights can be assigned to various user groups. The new protection level 4 makes it possible to also restrict communication to HMI devices.
- Improved manipulation protection:
  Changed or unauthorized transfers of engineering data are detected by the controller.
- For use of an Ethernet CP (CP 1543-1):
  - Additional access protection by means of a firewall
  - Establishment of secure VPN connections

Design and handling

- CPUs with display for plain text information (display simulator tool on the internet):
  - Information about article numbers, firmware versions, and the serial numbers of all connected modules can be displayed
  - Setting the IP address of the CPU and additional network settings possible directly on site, without programming device on the display
  - Display of occurring error messages directly as plain text message, meaning reduction in downtime
- Uniform front connectors for all modules and integrated potential bridges for flexible potential group formation simplify stock keeping and reduce wiring effort
- Integrated DIN rail in the S7-1500 mounting rail:
  quick and easy installation of additional components such as miniature circuit breakers, relays, etc.
- Central expansion with signal modules:
  for flexible adaptation to any application
- System cabling for digital signal modules:
  for fast and clearly arranged connecting to sensors and actuators in the field and simple wiring inside the control cabinet
- Power supply:
  - Load current supply modules (Power Modules) for supplying the module with 24 V
  - System power supply modules to supply power to the internal module electronics via the backplane bus
  - System power supply modules for retentively storing the entire work memory (max. 100 MB) on the controller
- Distributed expansion:
  - Use of up to 30 signal modules, communications modules, and technology modules via the PROFINET IM 155-5 interface module for the ET 200MP I/O system
  - No difference in terms of handling and system functions in central and distributed operation

Overview (continued)

Integrated system diagnostics

- Integrated system diagnostics for CPUs, activated by default:
  - Consistent plain text display of system diagnostics information in the display, TIA Portal, HMI, and Web server, even for drive messages. Messages are updated even if the CPU is in STOP state.
  - System diagnostics integrated in the CPU firmware. Configuration by user not required. The diagnostics is automatically updated on configuration changes.

Support of SIMATIC ProDiag S7-1500

- ProDiag is a concept for the easy creation of machine and plant diagnostics It increases availability and supports with fault analysis and elimination on site.

Data log (archives) and recipes

- SIMATIC Memory Card:
  - Plug-in load memory
  - Permits firmware updates
  - Storage option for STEP 7 projects (including comments and symbols), additional documentation, or csv/ASCII files (for recipes and archives)
  - Easy access to plant-relevant operating data and configuration data with Office tools via the SD card reader (two-way data exchange from and to the PLC)
- Integrated web server:
  - Easy access to plant-relevant operating data and configuration data, Motion Control diagnostics and display of trace recordings via a web browser

Approvals

The SIMATIC S7-1500 complies with the following national and international standards:

- cULus approval
- cULus HazLoc approval
- FM approval
- ATEX approval (only for 24 V; not for 230 V)
- UKEX approval
- CCCEx approval
- CE
- RCM (formerly C-Tick)
- KCC
- UKCA marking
- IECEx (24 V only; not for 230 V)
- EN 61000-6-4
- EN 60068-2-1/-2/-6/-14/-27/-30/-32
- EN 61131-2
- IEC 62443-4-1:2018 & IEC 62443-4-2:2019

You can find the marine approvals available for the S7-1500 on the internet (SIMATIC Customer Support) under this link.

The S7-1500 system is also suitable for operating at elevations up to 5000 m. You can find a list of all currently approved modules under this link.

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Technical specifications

General technical specifications	
Degree of protection	IP20 acc. to IEC 60 529
Ambient temperature	
• Horizontal installation	0…60 °C (display: at an operating temperature of typ. 50 °C, the display is switched off.)
• Vertical installation	0… 40 °C (display: at an operating temperature of typ. 40 °C, the display is switched off.)
Relative humidity	10 %…95 %, no condensation
Atmospheric pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)
Insulation	
• < 50 V	707 V DC test voltage (type test)
• < 150 V	2200 V DC test voltage
• < 250 V	2500 V DC test voltage
Electromagnetic compatibility	Requirements of the EMC directive; interference immunity according to IEC 61000-6-2
• Pulse-shaped disturbance variables	Test according to: Electrostatic discharge according to IEC 61000-4-2, burst pulses according to IEC 61000-4-4, energy single pulse (surge) according to IEC 61000-4-5,
• Sinusoidal disturbance variables	Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6 Requirements of the EMC directive; interference emission according to EN 61000-6-4
• Emission of radio frequency interference	Interference emission according to 61000-6-4 Interference emission of electromagnetic fields according to EN 61000-6-4
Mechanical stress	
• Vibrations	Testing according to EN 60068-2-6 Tested with: 5 Hz ≤ f ≤ 8.4 Hz, constant amplitude 7 mm; 9 Hz ≤ f ≤ 150 Hz, constant acceleration 2 g; duration of vibration: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes
• Shock	Testing according to EN 60068-2-27 Tested with: Half-wave: strength of shock 15 g peak value, 11 ms duration; shock direction: 3 shocks each in ± direction in each of the 3 mutually vertical axes

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Technical specifications

General technical data of SIPLUS S7-1500	
Ambient temperature range	-40/-25/-20 ... +55/60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Extended range of ambient conditions	

• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) //
	Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) //
	Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)

Relative humidity	
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

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Overview



- Entry-level CPU in the S7-1500 Controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call, Support
  - OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500, CPU 1511-1 PN Central processing unit with 300 KB work memory for program and 1.5 MB for data; 1st interface: PROFINET IRT with 2-port switch, 25 ns bit performance, SIMATIC Memory Card required Observe the approvals and certificate according to entry 109815653 at support.industry.siemens.com!	**6ES7511-1AL03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module For 35 mm S7-1500 CPUs with firmware >= V3.0	**6ES7591-1AB10-0AA0**
SIMATIC S7-1500, spare part, cover flap 35 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4AB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7511-1AL03-0AB0 CPU 1511-1PN, 300KB Prog., 1,5MB Data
General information	
Product type designation	CPU 1511-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7511-1AK02-0AB0
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7511-1AL03-0AB0 CPU 1511-1PN, 300KB Prog., 1,5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80

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Technical specifications (continued)

Article number	6ES7511-1AL03-0AB0 CPU 1511-1PN, 300KB Prog., 1,5MB Data
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	336 g

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Overview



- The CPU for applications with medium requirements for program/data storage in the S7-1500 Controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500, CPU 1513-1 PN Central processing unit with 600 KB work memory for program and 2.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 25 ns bit performance, SIMATIC Memory Card required Observe the approvals and certificate according to entry 109815653 at support.industry.siemens.com!	**6ES7513-1AM03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module For 35 mm S7-1500 CPUs with firmware >= V3.0	**6ES7591-1AB10-0AA0**
SIMATIC S7-1500, spare part, cover flap 35 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4AB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading1); Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7513-1AM03-0AB0 CPU 1513-1 PN, 600KB Prog., 2,5MB Data
General information	
Product type designation	CPU 1513-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7513-1AL02-0AB0
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	2.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7513-1AM03-0AB0 CPU 1513-1 PN, 600KB Prog., 2,5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160

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Technical specifications (continued)

Article number	6ES7513-1AM03-0AB0 CPU 1513-1 PN, 600KB Prog., 2,5MB Data
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	336 g

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Overview



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 Controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500, CPU 1515-2 PN Central processing unit with 1 MB work memory for program and 4.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required Observe approvals and certificates according to entry 109817466 at support.industry.siemens.com!	**6ES7515-2AN03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V20 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7515-2AN03-0AB0 CPU 1515-2 PN, 1MB Prog., 4,5MB Data
General information	
Product type designation	CPU 1515-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7515-2AM02-0AB0
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	1 Mbyte
• integrated (for data)	4.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7515-2AN03-0AB0 CPU 1515-2 PN, 1MB Prog., 4,5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7515-2AN03-0AB0 CPU 1515-2 PN, 1MB Prog., 4,5MB Data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

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Technical specifications (continued)

Article number	6ES7515-2AN03-0AB0 CPU 1515-2 PN, 1MB Prog., 4,5MB Data
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	456 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking.
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Two PROFINET IO IRT interfaces (X1 and X2), each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET interface X3 with separate IP address for network separation and Gbit Ethernet to transmit data at a speed of 1 Gbps.
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Note:
SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500, CPU 1517-3 PN	**6ES7517-3AQ10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500 spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**
STEP 7 Professional V21	

Selection and ordering data (continued)

Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Prof. V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3AQ10-0AB0 CPU 1517-3 PN, 4MB prog., 50MB data
General information	
Product type designation	CPU 1517-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0)
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	4 Mbyte
• integrated (for data)	50 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.6 ns
for word operations, typ.	1.3 ns
for fixed point arithmetic, typ.	1.3 ns
for floating point arithmetic, typ.	3.8 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7517-3AQ10-0AB0 CPU 1517-3 PN, 4MB prog., 50MB data
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	

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Technical specifications (continued)

Article number	6ES7517-3AQ10-0AB0 CPU 1517-3 PN, 4MB prog., 50MB data
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	20 480
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40

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Technical specifications (continued)

Article number	6ES7517-3AQ10-0AB0 CPU 1517-3 PN, 4MB prog., 50MB data
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 499 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
  Extremely high processing speed for binary and floating-point arithmetic
- Configurable performance boost (+25%)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Two PROFINET IO IRT interfaces (X1 and X2), each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET interface X3 with separate IP address for network separation and Gbit Ethernet to transmit data at a speed of 1 Gbps.
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500, CPU 1518-3 PN	**6ES7518-3AT10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	

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Selection and ordering data (continued)

SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap, 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	

Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21; floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-3AT10-0AB0 CPU 1518-3 PN, 12MB prog., 150MB data
General information	
Product type designation	CPU 1518-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0)
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	12 Mbyte
• integrated (for data)	150 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.3 ns
for word operations, typ.	0.8 ns
for fixed point arithmetic, typ.	0.8 ns
for floating point arithmetic, typ.	2.5 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7518-3AT10-0AB0 CPU 1518-3 PN, 12MB prog., 150MB data
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	

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Technical specifications (continued)

Article number	6ES7518-3AT10-0AB0 CPU 1518-3 PN, 12MB prog., 150MB data
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	30 720
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	

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Technical specifications (continued)

Article number	6ES7518-3AT10-0AB0 CPU 1518-3 PN, 12MB prog., 150MB data
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 637 g

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Overview



- The CPU with a large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- PROFIBUS DP master interface
- OPC UA server and client as Runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500, CPU 1516-3 PN/DP Central processing unit with 2 MB work memory for program and 7.5 MB for data 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 6 ns bit performance, SIMATIC Memory Card required *** Observe approvals and certificates according to entry 109817466 at support.industry.siemens.com! ***	**6ES7516-3AP03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket for use in environments subject to harsh chemicals and mechanical stress 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC FOOD bus cable with PE protective jacket for use in the food, beverages and tobacco industries, 2-wire, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable, underground cable 2-core, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**

Selection and ordering data (continued)

PROFIBUS FC FRNC cable GP, bus cable, flame-retardant and halogen-free bus cable with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	

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Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7516-3AP03-0AB0 CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
General information	
Product type designation	CPU 1516-3 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7516-3AN02-0AB0
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	2 Mbyte
• integrated (for data)	7.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7516-3AP03-0AB0 CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7516-3AP03-0AB0 CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; X3
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160

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Technical specifications (continued)

Article number	6ES7516-3AP03-0AB0 CPU 1516-3 PN/DP, 2MB Prog., 7,5MB Data
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	469 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET. PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- PROFIBUS DP master interface
  - OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:
SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500, CPU 1517-3 PN/DP Central processing unit with 2 MB work memory for program and 8 MB work memory for data 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 2 ns bit performance, SIMATIC Memory Card required	**6ES7517-3AP00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m Sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket for use in environments subject to harsh chemicals and mechanical stress 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC FOOD bus cable with PE protective jacket for use in the food, beverages and tobacco industries, 2-wire, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable, underground cable 2-core, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**

Selection and ordering data (continued)

PROFIBUS FC FRNC cable GP, bus cable, flame-retardant and halogen-free bus cable with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display for S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover for DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	

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Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Prof. V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3AP00-0AB0 CPU 1517-3 PN/DP, 2MB Prog./8MB Data
General information	
Product type designation	CPU 1517-3 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1); V13 Update 3 (FW V1.6) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	2 Mbyte
• integrated (for data)	8 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	2 ns
for word operations, typ.	3 ns
for fixed point arithmetic, typ.	3 ns
for floating point arithmetic, typ.	12 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7517-3AP00-0AB0 CPU 1517-3 PN/DP, 2MB Prog./8MB Data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7517-3AP00-0AB0 CPU 1517-3 PN/DP, 2MB Prog./8MB Data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; X3
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	10 240
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6ES7517-3AP00-0AB0 CPU 1517-3 PN/DP, 2MB Prog./8MB Data
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 929 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses; for network separation. The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500, CPU 1518-4 PN/DP Central processing unit with 6 MB work memory for program and 60 MB work memory for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: Ethernet, 4th interface: PROFIBUS, 1 ns bit performance, SIMATIC Memory Card required	**6ES7518-4AP00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m Sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket for use in environments subject to harsh chemicals and mechanical stress 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC FOOD bus cable with PE protective jacket for use in the food, beverages and tobacco industries, 2-wire, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable, underground cable 2-core, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP, bus cable, flame-retardant and halogen-free bus cable with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	

Selection and ordering data (continued)

Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display for S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover for DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**

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Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21; floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data
General information	
Product type designation	CPU 1518-4 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V17 (FW V2.9) / V13 (FW V1.5) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	6 Mbyte
• integrated (for data)	60 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes

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Technical specifications (continued)

Article number	6ES7518-4AP00-0AB0 CPU 1518-4 PN/DP, 6 MB Prog., 60MB Data
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 988 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-device.
  The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET

Overview (continued)

- Integrated Motion Control functionalities for controlling speed axes and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to ease of maintenance and ruggedness.
This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required.
Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++. This simplifies the creation or reuse of customer-specific, high-level language applications.
The CPU 1518-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518-4 PN/DP with regard to the control unit.
In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program. By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized.
Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note

SIMATIC Memory Card required for operation of the CPU.

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Selection and ordering data

SIMATIC S7-1500, CPU bundle consisting of: CPU 1518-4 PN/DP MFP (6ES7518-4AX00-1AB0) Including C/C++ Runtime and OPC UA Runtime license, 6 MB work memory for program and 60 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFINET basic services, 4th interface: PROFIBUS, 1 ns bit performance, SIMATIC Memory Card (min. 2 GB) required	**6ES7518-4AX00-1AC0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	

Selection and ordering data (continued)

SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket For use environments subject to harsh chemicals and mechanical stress, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**

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Selection and ordering data (continued)

Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display for S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover for DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC ODK 1500S	

Selection and ordering data (continued)

SIMATIC ODK 1500S V2.5, floating license for 1 user, E-SW, software and documentation on DVD, license key on USB flash drive Class A, 6 languages (en, de, fr, es, it, cn), runs on Windows 7, Windows 8.1 and Windows 10	**6ES7806-2CD03-0YA0**
SIMATIC ODK 1500S V2.5, floating license for 1 user, E-SW, software, documentation and license key download[1] Class A, 6 languages (en, de, fr, es, it, cn), runs on Windows 7, Windows 8.1 and Windows 10 Consignee email address required for delivery	**6ES7806-2CD03-0YG0**
SIMATIC Target (TM) for Simulink(R) V6.0, floating license download[1] Engineering software; software, documentation and license key for download; Class A; 2 languages: de, en; runs under Win10; Win11; Software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge Runtime via the LiveTwin Edge app Consignee email address required for delivery	**6ES7823-1BE05-0YA5**
SIMATIC Target (TM) for Simulink(R) V6.0 Upgrade V2.0 .. V5.0 -> V6.0, floating license download[1] Engineering software, software, documentation and license key for download; Class A; 2 languages: de, en; runs under Win10; Win11; Software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge Runtime via the LiveTwin Edge app Consignee email address required for delivery	**6ES7823-1BE05-0YE5**
Target + ODK 1500S Bundle includes: SIMATIC ODK 1500S V2.5 and SIMATIC Target (TM) for Simulink (R) V6.0, floating license download[1] E-SW, software, documentation and license key for download, Class A, 2 languages: de, en; runs under Win10; Win11; Software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge Runtime via the LiveTwin Edge app Consignee email address required for delivery	**6ES7823-1BE15-0YA0**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-4AX00-1AC0 CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
General information	
Product type designation	CPU 1518-4 PN/DP MFP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V18 (FW V3.0); V15 (FW V2.5) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	6 Mbyte
• integrated (for data)	60 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Working memory for additional functions	
• Integrated (for C/C++ Runtime application)	1 024 Mbyte
• available (for Linux runtime application)	1 Gbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte; the memory card must have at least 2 GB of space on it
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted

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Technical specifications (continued)

Article number	6ES7518-4AX00-1AC0 CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No

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Technical specifications (continued)

Article number	6ES7518-4AX00-1AC0 CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1; C/C++ Runtime can also be reached via this port
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT

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Technical specifications (continued)

Article number	6ES7518-4AX00-1AC0 CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm

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Technical specifications (continued)

Article number	6ES7518-4AX00-1AC0 CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
Weights	
Weight, approx.	2 093 g

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Overview



- Entry-level CPU in the S7-1500 Controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call, Support
  - OPC UA Companion Specifications
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- SIMATIC Memory Card required for operation of the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1511-1 PN	
(Extended temperature range and exposure to environmental substances)	
300 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	**6AG1511-1AL03-2AB0**
Temperature range -40 ... +70 °C	**6AG1511-1AL03-7AB0**
System power supply	
(Extended temperature range and exposure to environmental substances)	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply	
(Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display	**6AG1591-1AB00-2AA0**
(Extended temperature range and exposure to environmental substances)	
For SIPLUS CPU 1511-1 PN and CPU 1513-1 PN; spare part	
Other accessories	See SIMATIC S7-1500, CPU 1511-1 PN

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Technical specifications

Article number	6AG1511-1AL03-2AB0 SIPLUS S7-1500 CPU 1511-1 PN	6AG1511-1AL03-7AB0 SIPLUS S7-1500 CPU 1511-1 PN
General information		
Product type designation	CPU 1511-1 PN	CPU 1511-1 PN
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Display		
Screen diagonal [cm]	3.45 cm	3.45 cm
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	300 kbyte	300 kbyte
• integrated (for data)	1.5 Mbyte	1.5 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	6 ns	6 ns
for word operations, typ.	7 ns	7 ns
for fixed point arithmetic, typ.	9 ns	9 ns
for floating point arithmetic, typ.	37 ns	37 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes

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Technical specifications (continued)

Article number	6AG1511-1AL03-2AB0 SIPLUS S7-1500 CPU 1511-1 PN	6AG1511-1AL03-7AB0 SIPLUS S7-1500 CPU 1511-1 PN
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
Protocols		
Number of connections		
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode		
- Media redundancy		
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes	Yes
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool

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Technical specifications (continued)

Article number	6AG1511-1AL03-2AB0 SIPLUS S7-1500 CPU 1511-1 PN	6AG1511-1AL03-7AB0 SIPLUS S7-1500 CPU 1511-1 PN
• Number of available Motion Control resources for technology objects	1 120	1 120
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Security		
PROFINET Security Class	1	1
signed firmware update	Yes	Yes
Secure Boot	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	70 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)

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Technical specifications (continued)

Article number	6AG1511-1AL03-2AB0 SIPLUS S7-1500 CPU 1511-1 PN	6AG1511-1AL03-7AB0 SIPLUS S7-1500 CPU 1511-1 PN
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	No	No
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users	100	100
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	336 g	400 g

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Overview



- The CPU for applications with medium/high requirements for program/data memory in the S7-1500 Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA server and client as runtime option for the easy connection of SIPLUS S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Companion Specifications
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- SIMATIC Memory Card required for operation of the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1513-1 PN	
(Extended temperature range and exposure to environmental substances)	
600 KB work memory for program, 2.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required	
Temperature range -40 ... +60 °C	**6AG1513-1AM03-2AB0**
Temperature range -40 ... +70 °C	**6AG1513-1AM03-7AB0**
Accessories	
System power supply	
(Extended temperature range and exposure to environmental substances)	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply	
(Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display	**6AG1591-1AB00-2AA0**
(Extended temperature range and exposure to environmental substances)	
For SIPLUS CPU 1511-1 PN and CPU 1513-1 PN; spare part	
Other accessories	See SIMATIC S7-1500, CPU 1513-1 PN

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Technical specifications

Article number	6AG1513-1AM03-2AB0 SIPLUS S7-1500 CPU 1513-1 PN	6AG1513-1AM03-7AB0 SIPLUS S7-1500 CPU 1513-1 PN
General information		
Product type designation	CPU 1513-1 PN	CPU 1513-1 PN
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Display		
Screen diagonal [cm]	3.45 cm	3.45 cm
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	600 kbyte	600 kbyte
• integrated (for data)	2.5 Mbyte	2.5 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	25 ns	25 ns
for word operations, typ.	32 ns	32 ns
for fixed point arithmetic, typ.	42 ns	42 ns
for floating point arithmetic, typ.	170 ns	170 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes

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Technical specifications (continued)

Article number	6AG1513-1AM03-2AB0 SIPLUS S7-1500 CPU 1513-1 PN	6AG1513-1AM03-7AB0 SIPLUS S7-1500 CPU 1513-1 PN
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
Protocols		
Number of connections		
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode		
- Media redundancy		
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes	Yes
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool

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Technical specifications (continued)

Article number	6AG1513-1AM03-2AB0 SIPLUS S7-1500 CPU 1513-1 PN	6AG1513-1AM03-7AB0 SIPLUS S7-1500 CPU 1513-1 PN
• Number of available Motion Control resources for technology objects	1 120	1 120
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Security		
PROFINET Security Class	1	1
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	70 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		

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Technical specifications (continued)

Article number	6AG1513-1AM03-2AB0 SIPLUS S7-1500 CPU 1513-1 PN	6AG1513-1AM03-7AB0 SIPLUS S7-1500 CPU 1513-1 PN
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	No	No
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	336 g	400 g

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Overview



- The CPU with large program and data memory in the S7-1500 Controller product range for applications with high program scope requirements.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O.
- PROFINET IO IRT interface with 2-port switch.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device.
- PROFIBUS DP master interface
- UA server and client as runtime option for easy connection of the SIMATIC S7-1500 to non-Siemens devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- SIMATIC Memory Card required for operation of the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1516-3 PN/DP	
(Extended temperature range and exposure to environmental substances)	
2 MB work memory for program, 7.5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; 10 ns bit performance, SIMATIC Memory Card required Temperature range -40 ... +60 °C	**6AG1516-3AP03-2AB0**
2 MB work memory for program, 7.5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; 6 ns bit performance, SIMATIC Memory Card required Temperature range -40 ... +70 °C	**6AG1516-3AP03-7AB0**
Accessories	
System power supply	
(Extended temperature range and exposure to environmental substances)	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply	
(Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display	
(Extended temperature range and exposure to environmental substances)	
for 6AG1516-3AN02-7AB0; spare part	**6AG1591-1BB00-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1516-3 PN/DP

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Technical specifications

Article number	6AG1516-3AP03-2AB0 SIPLUS S7-1500 CPU 1516-3 PN	6AG1516-3AP03-7AB0 SIPLUS S7-1500 CPU 1516-3 PN
General information		
Product type designation	CPU 1516-3 PN/DP	CPU 1516-3 PN/DP
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Display		
Screen diagonal [cm]	6.1 cm	6.1 cm
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	2 Mbyte	2 Mbyte
• integrated (for data)	7.5 Mbyte	7.5 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	6 ns	6 ns
for word operations, typ.	7 ns	7 ns
for fixed point arithmetic, typ.	9 ns	9 ns
for floating point arithmetic, typ.	37 ns	37 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes

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Technical specifications (continued)

Article number	6AG1516-3AP03-2AB0 SIPLUS S7-1500 CPU 1516-3 PN	6AG1516-3AP03-7AB0 SIPLUS S7-1500 CPU 1516-3 PN
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
2. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X2	Yes; X2
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		
- Isochronous mode	No	No
- Direct data exchange	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32	32

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Technical specifications (continued)

Article number	6AG1516-3AP03-2AB0 SIPLUS S7-1500 CPU 1516-3 PN	6AG1516-3AP03-7AB0 SIPLUS S7-1500 CPU 1516-3 PN
- of which in line, max.	32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
3. Interface		
Interface types		
• RS 485	Yes; X3	Yes; X3
• Number of ports	1	1
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	No	No
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols		
Number of connections		
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode		
- Media redundancy		
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes	Yes

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Technical specifications (continued)

Article number	6AG1516-3AP03-2AB0 SIPLUS S7-1500 CPU 1516-3 PN	6AG1516-3AP03-7AB0 SIPLUS S7-1500 CPU 1516-3 PN
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Security		
PROFINET Security Class	1	1
signed firmware update	Yes	Yes
Secure Boot	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	70 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)

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Technical specifications (continued)

Article number	6AG1516-3AP03-2AB0 SIPLUS S7-1500 CPU 1516-3 PN	6AG1516-3AP03-7AB0 SIPLUS S7-1500 CPU 1516-3 PN
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	No	No
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users	100	100
Dimensions		
Width	70 mm	70 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	469 g	545 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses; for network separation. The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion Specifications
  - OPC UA Alarms and Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

Note:
SIMATIC Memory Card required for operation of the CPU

Overview (continued)

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1518-3 PN (Exposure to environmental substances) Work memory 12 MB for program and 150 MB for data, 2x PROFINET IRT interface with 2-port switch, Ethernet interface; 0.3 ns bit performance; SIMATIC Memory Card required	**6AG1518-3AT10-4AB0**
Accessories	
SIPLUS S7-1500 Cooling Fan 175 mm (Extended temperature range and exposure to environmental substances) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AA01-7AA0**
System power supply (Extended temperature range and exposure to environmental substances)	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) For SIPLUS CPU 1516-3 PN/DP and SIPLUS CPU 1518-4 PN/DP; spare part	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1518-4 PN/DP

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Technical specifications

Article number	6AG1518-3AT10-4AB0 SIPLUS S7-1500 CPU 1518-3 PN
General information	
Product type designation	CPU 1518-3 PN
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	12 Mbyte
• integrated (for data)	150 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.3 ns
for word operations, typ.	0.8 ns
for fixed point arithmetic, typ.	0.8 ns
for floating point arithmetic, typ.	2.5 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes

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Technical specifications (continued)

Article number	6AG1518-3AT10-4AB0 SIPLUS S7-1500 CPU 1518-3 PN
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	

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Technical specifications (continued)

Article number	6AG1518-3AT10-4AB0 SIPLUS S7-1500 CPU 1518-3 PN
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	30 720
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40

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Technical specifications (continued)

Article number	6AG1518-3AT10-4AB0 SIPLUS S7-1500 CPU 1518-3 PN
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; 70 °C with SIPLUS S7-1500 Cooling Fan 175 mm (6AG1593-0AA01-7AA0); display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	0 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes

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Technical specifications (continued)

Article number	6AG1518-3AT10-4AB0 SIPLUS S7-1500 CPU 1518-3 PN
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 637 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses; for network separation. The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion Specifications
  - OPC UA Alarms and Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1518-4 PN/DP (Exposure to environmental substances) 3 MB work memory for program, 10 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6AG1518-4AP00-4AB0**
Accessories	
SIPLUS S7-1500 Cooling Fan 175 mm (Extended temperature range and exposure to environmental substances) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AA00-7AA0**
SIPLUS S7-1500 Cooling Fan 175 mm (Extended temperature range and exposure to environmental substances) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AA01-7AA0**
System power supply (Extended temperature range and exposure to environmental substances)	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) For SIPLUS CPU 1516-3 PN/DP and SIPLUS CPU 1518-4 PN/DP; spare part	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1518-4 PN/DP

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Technical specifications

Article number	6AG1518-4AP00-4AB0 SIPLUS S7-1500 CPU 1518-4 PN/DP
General information	
Product type designation	CPU 1518-4 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	6 Mbyte
• integrated (for data)	60 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6AG1518-4AP00-4AB0 SIPLUS S7-1500 CPU 1518-4 PN/DP
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6AG1518-4AP00-4AB0 SIPLUS S7-1500 CPU 1518-4 PN/DP
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes

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Technical specifications (continued)

Article number	6AG1518-4AP00-4AB0 SIPLUS S7-1500 CPU 1518-4 PN/DP
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C; = Tmin
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability

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Technical specifications (continued)

Article number	6AG1518-4AP00-4AB0 SIPLUS S7-1500 CPU 1518-4 PN/DP
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 988 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-device.
  The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server (Data Access) as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion Specifications
  - OPC UA Alarms and Conditions
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed axes and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Overview (continued)

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518-4 PN/DP MFP allows the merging of previously separate applications on a common platform, and continues to meet the high demands of the S7-1500 with regard to ease of maintenance and ruggedness.
This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required.
Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++. This simplifies the creation or reuse of customer-specific, high-level language applications.
The CPU 1518-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518-4 PN/DP with regard to the control unit.
In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program. By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized.
Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

SIPLUS CPU 1518-4 PN/DP MFP (Exposure to environmental substances) 4 MB work memory for program, 20 MB for data, 50 MB for CPU function library in the CPU Runtime, 500 MB for C/C++ Runtime application, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; C/C++ runtime and OPC UA Runtime license included; SIMATIC Memory Card required	**6AG1518-4AX00-4AC0**
Accessories	
SIPLUS S7-1500 cooling fan 175 mm (Extended temperature range and exposure to environmental substances) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AA00-7AA0**
System power supply (Extended temperature range and exposure to environmental substances)	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) For SIPLUS CPU 1516-3 PN/DP and SIPLUS CPU 1518-4 PN/DP; spare part	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1518-4 PN/DP MFP

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Technical specifications

Article number	6AG1518-4AX00-4AC0 SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
General information	
Product type designation	CPU 1518-4 PN/DP MFP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	6 Mbyte
• integrated (for data)	60 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Working memory for additional functions	
• Integrated (for C/C++ Runtime application)	1 024 Mbyte
• available (for Linux runtime application)	1 Gbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte; the memory card must have at least 2 GB of space on it
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted

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Technical specifications (continued)

Article number	6AG1518-4AX00-4AC0 SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No

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Technical specifications (continued)

Article number	6AG1518-4AX00-4AC0 SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1; C/C++ Runtime can also be reached via this port
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD

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Technical specifications (continued)

Article number	6AG1518-4AX00-4AC0 SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C; = Tmin
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)

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Technical specifications (continued)

Article number	6AG1518-4AX00-4AC0 SIPLUS S7-1500 CPU 1518-4 PN/DP MFP
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	2 093 g

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Overview



- The compact CPU with integral digital and analog inputs and outputs in the product spectrum of the S7-1500 Controllers
- With integrated technological functions, e.g. high-speed counter (HSC), frequency measurement, period duration measurement or stepper motor control, pulse width modulation, frequency output
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Isochronous mode (distributed)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500, compact CPU CPU 1511C-1 PN Central processing unit 300 KB work memory for program and 1.5 MB for data, 16 digital inputs, 16 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, 4 high-speed outputs for PTO/PWM/frequency output, 1st interface: PROFINET IRT with 2-port switch, 25 ns bit performance, incl. push-in front connector, SIMATIC Memory Card required	**6ES7511-1CL03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
Front connectors	
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
Shielding set I/O	
SIMATIC S7-1500, spare part, shielding set Consisting of: * 4x shield terminal, * 4x shielding bracket, * 4x 24 V DC infeed element with push-in technology, suitable for analog modules, technology modules and compact CPU of the S7-1500, suitable for all front connectors for 25 mm wide modules	**6ES7590-5CA10-0XA0**
SIMATIC S7-1500, spare part, suitable shield terminal Suitable for analog modules and technology modules without shielding bracket and without 24 V DC infeed element, 10 units per packing unit	**6ES7590-5BA00-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**

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Selection and ordering data (continued)

SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F, PN-PN coupler Grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**

Selection and ordering data (continued)

Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module For 35 mm S7-1500 CPUs with firmware >= V3.0	**6ES7591-1AB10-0AA0**
SIMATIC S7-1500, spare part, cover flap 35 mm with cutout, for displays and display buttons, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4AB00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7511-1CL03-0AB0 CPU 1511C-1 PN, 300KB Prog., 1,5MB Data
General information	
Product type designation	CPU 1511C-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7511-1CK01-0AB0
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
Digital inputs	
integrated channels (DI)	16
Digital outputs	
integrated channels (DO)	16
Short-circuit protection	Yes; electronic/thermal
Analog inputs	
integrated channels (AI)	5
Analog outputs	
integrated channels (AO)	2
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4

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Technical specifications (continued)

Article number	6ES7511-1CL03-0AB0 CPU 1511C-1 PN, 300KB Prog., 1,5MB Data
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes

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Technical specifications (continued)

Article number	6ES7511-1CL03-0AB0 CPU 1511C-1 PN, 300KB Prog., 1,5MB Data
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	85 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	943 g; with front connector

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Overview



- The compact CPU with integral digital and analog inputs and outputs in the product spectrum of the S7-1500 Controllers
- With integrated technological functions, e.g. high-speed counter (HSC), frequency measurement, period duration measurement or stepper motor control, pulse width modulation, frequency output
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Isochronous mode (distributed)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500, compact CPU CPU 1512C-1 PN Central processing unit with work memory: 400 KB work memory for program and 2 MB for data, 32 digital inputs, 32 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, 4 high-speed outputs for PTO/PWM/frequency output 1st interface: PROFINET IRT with 2-port switch, 25 ns bit performance, incl. push-in front connector, SIMATIC Memory Card required	**6ES7512-1CM03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
Front connectors	
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
Shielding set I/O	
SIMATIC S7-1500, spare part, shielding set Consisting of: * 4x shield terminal, * 4x shielding bracket, * 4x 24 V DC infeed element with push-in technology, suitable for analog modules, technology modules and compact CPU of the S7-1500, suitable for all front connectors for 25 mm wide modules	**6ES7590-5CA10-0XA0**
SIMATIC S7-1500, spare part, suitable shield terminal Suitable for analog modules and technology modules without shielding bracket and without 24 V DC infeed element, 10 units per packing unit	**6ES7590-5BA00-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**

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Selection and ordering data (continued)

SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F, PN-PN coupler Grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m. 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module For 35 mm S7-1500 CPUs with firmware >= V3.0	**6ES7591-1AB10-0AA0**
SIMATIC S7-1500, spare part, cover flap 35 mm with cutout, for displays and display buttons, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4AB00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7512-1CM03-0AB0 CPU 1512C-1 PN, 400 KB Prog., 2 MB Data
General information	
Product type designation	CPU 1512C-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7512-1CK01-0AB0
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	400 kbyte
• integrated (for data)	2 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
Digital inputs	
integrated channels (DI)	32
Digital outputs	
integrated channels (DO)	32
Short-circuit protection	Yes; electronic/thermal
Analog inputs	
integrated channels (AI)	5
Analog outputs	
integrated channels (AO)	2
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4

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Technical specifications (continued)

Article number	6ES7512-1CM03-0AB0 CPU 1512C-1 PN, 400 KB Prog., 2 MB Data
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes

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Technical specifications (continued)

Article number	6ES7512-1CM03-0AB0 CPU 1512C-1 PN, 400 KB Prog., 2 MB Data
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	110 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 233 g; with front connector

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Overview



- Entry-level CPU in the S7-1500F Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500F, CPU 1511F-1 PN Central processing unit with 450 KB work memory for program and 1.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 25 ns bit performance, SIMATIC Memory Card required Observe the approvals and certificate according to entry 109815653 at support.industry.siemens.com!	**6ES7511-1FL03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module For 35 mm S7-1500 CPUs with firmware >= V3.0	**6ES7591-1AB10-0AA0**
SIMATIC S7-1500, spare part, cover flap 35 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4AB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21; floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7511-1FL03-0AB0 CPU 1511F-1PN, 450KB prog, 1,5MB Data
General information	
Product type designation	CPU 1511F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V18 (FW V3.0) or higher; with older TIA Portal versions configurable as 6ES7511-1FK02-0AB0
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	450 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7511-1FL03-0AB0 CPU 1511F-1PN, 450KB prog, 1,5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160

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Technical specifications (continued)

Article number	6ES7511-1FL03-0AB0 CPU 1511F-1PN, 450KB prog, 1,5MB Data
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	336 g

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Overview



- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the S7-1500 Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500F, CPU 1513F-1 PN Central processor unit with 900 KB work memory for program and 2.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 25 ns bit performance, SIMATIC Memory Card required Observe the approvals and certificate according to entry 109815653 at support.industry.siemens.com!	**6ES7513-1FM03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module For 35 mm S7-1500 CPUs with firmware >= V3.0	**6ES7591-1AB10-0AA0**
SIMATIC S7-1500, spare part, cover flap 35 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4AB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21; floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7513-1FM03-0AB0 CPU 1513F-1 PN, 900KB Prog., 2,5MB data
General information	
Product type designation	CPU 1513F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7 513-1FL02-0AB0
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	2.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7513-1FM03-0AB0 CPU 1513F-1 PN, 900KB Prog., 2,5MB data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160

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Technical specifications (continued)

Article number	6ES7513-1FM03-0AB0 CPU 1513F-1 PN, 900KB Prog., 2,5MB data
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	336 g

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Overview



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500F, CPU 1515F-2 PN Central processing unit with 1.5 MB work memory for program and 4.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required *** Observe approvals and certificates according to entry 109817466! ***	**6ES7515-2FN03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7515-2FN03-0AB0 CPU 1515F-2 PN, 1,5MB Prog.,4,5MB Data
General information	
Product type designation	CPU 1515F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7515-2FM02-0AB0
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	4.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7515-2FN03-0AB0 CPU 1515F-2 PN, 1,5MB Prog.,4,5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7515-2FN03-0AB0 CPU 1515F-2 PN, 1,5MB Prog.,4,5MB Data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

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Technical specifications (continued)

Article number	6ES7515-2FN03-0AB0 CPU 1515F-2 PN, 1,5MB Prog.,4,5MB Data
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	456 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- Two PROFINET IO IRT interfaces (X1 and X2), each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET interface X3 with separate IP address for network separation and Gbit Ethernet to transmit data at a speed of 1 Gbps.
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Note

SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500F, CPU 1517F-3 PN Central processing unit with 6 MB work memory for program and 50 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET IRT with 2-port switch, 3rd interface: Ethernet, 0.6 ns bit performance SIMATIC Memory Card required	**6ES7517-3FQ10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3FQ10-0AB0 CPU 1517F-3 PN, 6MB prog., 50MB data
General information	
Product type designation	CPU 1517F-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V20 (FW V4.0) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	6 Mbyte
• integrated (for data)	50 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.6 ns
for word operations, typ.	1.3 ns
for fixed point arithmetic, typ.	1.3 ns
for floating point arithmetic, typ.	3.8 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7517-3FQ10-0AB0 CPU 1517F-3 PN, 6MB prog., 50MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7517-3FQ10-0AB0 CPU 1517F-3 PN, 6MB prog., 50MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	20 480
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6ES7517-3FQ10-0AB0 CPU 1517F-3 PN, 6MB prog., 50MB data
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 499 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- Configurable performance boost (+25%)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- Two PROFINET IO IRT interfaces (X1 and X2), each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET interface X3 with separate IP address for network separation and Gbit Ethernet to transmit data at a speed of 1 Gbps.
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Overview (continued)

Note:
SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500F, CPU 1518F- PN Central processing unit with 18 MB work memory for program and 150 MB work memory for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET IRT with 2-port switch, 3rd interface: Ethernet, 0.3 ns bit performance SIMATIC Memory Card required	**6ES7518-3FT10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-3FT10-0AB0 CPU 1518F-3 PN, 18MB prog., 150MB data
General information	
Product type designation	CPU 1518F-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0)
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	18 Mbyte
• integrated (for data)	150 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.3 ns
for word operations, typ.	0.8 ns
for fixed point arithmetic, typ.	0.8 ns
for floating point arithmetic, typ.	2.5 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7518-3FT10-0AB0 CPU 1518F-3 PN, 18MB prog., 150MB data
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	

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Technical specifications (continued)

Article number	6ES7518-3FT10-0AB0 CPU 1518F-3 PN, 18MB prog., 150MB data
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	30 720
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	

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Technical specifications (continued)

Article number	6ES7518-3FT10-0AB0 CPU 1518F-3 PN, 18MB prog., 150MB data
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 637 g

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Overview



- The CPU with a large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages.

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500F, CPU 1516F-3 PN/DP Central processing unit with 3 MB work memory for program and 7.5 MB for data 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 6 ns bit performance, SIMATIC Memory Card required Observe approvals and certificates according to entry 109817466 at support.industry.siemens.com!	**6ES7516-3FP03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail; Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket For use environments subject to harsh chemicals and mechanical stress, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**

Selection and ordering data (continued)

PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	

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Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7516-3FP03-0AB0 CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
General information	
Product type designation	CPU 1516F-3 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7516-3FN02-0AB0
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7516-3FP03-0AB0 CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7516-3FP03-0AB0 CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; X3
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160

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Technical specifications (continued)

Article number	6ES7516-3FP03-0AB0 CPU 1516F-3 PN/DP, 3MB Prog, 7,5MB Data
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	469 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500F, CPU 1517F-3 PN Central processing unit with 3 MB work memory for program and 8 MB work memory for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 2 ns bit performance, SIMATIC Memory Card required	**6ES7517-3FP00-0AB0**
SIMATIC S7-1500F, CPU 1517F-3 PN/DP Central processing unit with 3 MB work memory for program and 8 MB work memory for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 2 ns bit performance, SIMATIC Memory Card required	**6ES7517-3FP01-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m Sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket for use in environments subject to harsh chemicals and mechanical stress 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC FOOD bus cable with PE protective jacket for use in the food, beverages and tobacco industries, 2-wire, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**

Selection and ordering data (continued)

PROFIBUS FC underground cable, underground cable 2-core, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP, bus cable, flame-retardant and halogen-free bus cable with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	

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Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco Requirement: STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V10; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3FP00-0AB0 CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	6ES7517-3FP01-0AB0 CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data
General information		
Product type designation	CPU 1517F-3 PN/DP	CPU 1517F-3 PN/DP
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1); V13 Update 3 (FW V1.6) or higher	V19 (FW V3.1); with older TIA Portal versions configurable as 6ES7517-3FP00-0AB0
Display		
Screen diagonal [cm]	6.1 cm	6.1 cm
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	3 Mbyte	3 Mbyte
• integrated (for data)	8 Mbyte	8 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	2 ns	2 ns
for word operations, typ.	3 ns	3 ns
for fixed point arithmetic, typ.	3 ns	3 ns
for floating point arithmetic, typ.	12 ns	12 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		

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Technical specifications (continued)

Article number	6ES7517-3FP00-0AB0	6ES7517-3FP01-0AB0
	CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	512	512
- of which in line, max.	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
2. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X2	Yes; X2
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		
- Isochronous mode	No	No
- Direct data exchange	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

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Technical specifications (continued)

Article number	6ES7517-3FP00-0AB0 CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	6ES7517-3FP01-0AB0 CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
3. Interface		
Interface types		
• RS 485	Yes; X3	Yes; X3
• Number of ports	1	1
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	No	No
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols		
Number of connections		
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode		
- Media redundancy		
- Media redundancy	only via 1st interface (X1)	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space

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Technical specifications (continued)

Article number	6ES7517-3FP00-0AB0 CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data	6ES7517-3FP01-0AB0 CPU 1517F-3 PN/DP, 3MB Prog., 8MB Data
• Alarms and Conditions	Yes	Yes
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	10 240	10 240
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Security		
PROFINET Security Class	1	1
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
Dimensions		
Width	175 mm	175 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	1 929 g	2 090 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with highest requirements regarding program scope and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP addresses
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages.

Note:
SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500F, CPU 1518F- PN Central processing unit with 9 MB work memory for program and 60 MB work memory for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFINET basic services, 4th interface: PROFIBUS, 1 ns bit performance, SIMATIC Memory Card required	**6ES7518-4FP00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m Sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket for use in environments subject to harsh chemicals and mechanical stress 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC FOOD bus cable with PE protective jacket for use in the food, beverages and tobacco industries, 2-wire, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable, underground cable 2-core, shielded Sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**

Selection and ordering data (continued)

PROFIBUS FC FRNC cable GP, bus cable, flame-retardant and halogen-free bus cable with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**

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Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco Requirement: STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-4FP00-0AB0 CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data
General information	
Product type designation	CPU 1518F-4PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1); V13 (FW V1.5) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	9 Mbyte
• integrated (for data)	60 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7518-4FP00-0AB0 CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7518-4FP00-0AB0 CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call

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Technical specifications (continued)

Article number	6ES7518-4FP00-0AB0 CPU 1518F-4 PN/DP, 9 MB Prog, 60MB Data
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	2 079 g

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Overview



- CPU with an extremely large program and data memory in the S7-1500 Controller product range for demanding standard and fail-safe applications with demanding requirements regarding program scope, performance and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-device.
  The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA Server (Data Access) as Runtime option for the easy connection of the SIMATIC S7-1500 to third-party devices/systems
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed axes and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Overview (continued)

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518F-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to ease of maintenance and ruggedness.
This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Besides the option of running C/C++ code in the standard STEP 7 program, the multi-functional platform CPU 1518F-4 PN/DP MFP thus provides an additional second independent runtime environment which facilitates execution of C/C++ applications in parallel to the STEP 7 program if required.
Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++. This simplifies the creation or reuse of customer-specific, high-level language applications.
The CPU 1518F-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518F-4 PN/DP with regard to the control part.
In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program. By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized.
Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note

SIMATIC Memory Card required for operation of the CPU.

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Selection and ordering data

SIMATIC S7-1500F, CPU bundle consisting of: CPU 1518F-4 PN/DP MFP (6ES7518-4FX00-1AB0) Including C/C++ Runtime and OPC UA Runtime license, 9 MB work memory for program and 60 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFINET basic services, 4th interface: PROFIBUS, 1 ns bit performance, SIMATIC Memory Card (min. 2 GB) required	**6ES7518-4FX00-1AC0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector For system power supply modules (PS) and load current supply modules (PM), 10 pieces per packing unit	**6ES7590-8AA00-0AA0**

Selection and ordering data (continued)

Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket For use environments subject to harsh chemicals and mechanical stress, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**

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Selection and ordering data (continued)

Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover For DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**

Selection and ordering data (continued)

STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
SIMATIC ODK 1500S	
SIMATIC ODK 1500S V2.5, floating license for 1 user, Engineering software, software and documentation on DVD License key on USB flash drive, Class A, 6 languages (en, de, fr, es, it, cn), runs on Windows 7, Windows 8.1 and Windows 10	**6ES7806-2CD03-0YA0**
SIMATIC ODK 1500S V2.5, floating license for 1 user, E-SW, software, documentation and license key download[1)] Class A, 6 languages (en, de, fr, es, it, cn), runs on Windows 7, Windows 8.1 and Windows 10 Consignee email address required for delivery	**6ES7806-2CD03-0YG0**
SIMATIC Target for Simulink V6.0	
SIMATIC Target (TM) for Simulink(R) V6.0 SP1, floating license download[1)] Engineering software; software, documentation and license key for download; Class A; 2 languages: en, de; software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge Runtime via the LiveTwin Edge app For system requirements specification, see under this link Consignee email address required for delivery	**6ES7823-1BE05-0YA5**
SIMATIC Target (TM) for Simulink(R) V6.0 SP1 upgrade V2.0..V5.0 -> V6.0 SP1 floating license download Engineering software, software, documentation and license key for download; Class A; 2 languages: en, de; software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge Runtime via the LiveTwin Edge app For system requirements specification, see under this link Consignee email address required for delivery	**6ES7823-1BE05-0YE5**

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Selection and ordering data (continued)

Target + ODK 1500S Bundle includes: SIMATIC ODK 1500S V2.5 and SIMATIC Target (TM) for Simulink (R) V6.0 SP1, floating license download E-SW, software, documentation and license key for download, Class A, 2 languages: en, de; software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge Runtime via the LiveTwin Edge app For system requirements specification, see under this link Consignee email address required for delivery	**6ES7823-1BE15-0YA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-4FX00-1AC0 CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
General information	
Product type designation	CPU 1518F-4 PN/DP MFP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V18 (FW V3.0) / V15 (FW V2.5) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	9 Mbyte
• integrated (for data)	60 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Working memory for additional functions	
• Integrated (for C/C++ Runtime application)	1 024 Mbyte
• available (for Linux runtime application)	1 Gbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte; the memory card must have at least 2 GB of space on it
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted

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Technical specifications (continued)

Article number	6ES7518-4FX00-1AC0 CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No

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Technical specifications (continued)

Article number	6ES7518-4FX00-1AC0 CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1; C/C++ Runtime can also be reached via this port
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT

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Technical specifications (continued)

Article number	6ES7518-4FX00-1AC0 CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm

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Technical specifications (continued)

Article number	6ES7518-4FX00-1AC0 CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
Weights	
Weight, approx.	2 093 g

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Overview



SIMATIC S7-1500F CPU 1511F-1 PN

- Entry-level CPU in the SIPLUS S7-1500F Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages
- SIMATIC Memory Card required for operation of the CPU

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1511F-1 PN (Extended temperature range and exposure to environmental substances) Fail-safe central processing unit with work memory 450 KB for program, 1.5 MB for data, 1st interface: PROFINET IRT with 2-port switch; SIMATIC Memory Card required Temperature range -40 ... +60 °C	**6AG1511-1FL03-2AB0**
Accessories	
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) For SIPLUS CPU 1511F-1 PN and CPU 1513F-1 PN; spare part	**6AG1591-1AA01-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1511F-1 PN

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Technical specifications

Article number	6AG1511-1FL03-2AB0 SIPLUS S7-1500 CPU 1511F-1 PN
General information	
Product type designation	CPU 1511F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	450 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6AG1511-1FL03-2AB0 SIPLUS S7-1500 CPU 1511F-1 PN
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6AG1511-1FL03-2AB0 SIPLUS S7-1500 CPU 1511F-1 PN
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes

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Technical specifications (continued)

Article number	6AG1511-1FL03-2AB0 SIPLUS S7-1500 CPU 1511F-1 PN
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	336 g

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Overview



- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the SIPLUS S7-1500 Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages
- SIMATIC Memory Card required for operation of the CPU.

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1513F-1 PN (Extended temperature range and exposure to environmental substances) Fail-safe CPU, 900 KB work memory for program, 2.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC Memory Card required Temperature range -40 ... +60 °C	**6AG1513-1FM03-2AB0**
Accessories	
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) For SIPLUS CPU 1511F-1 PN and CPU 1513F-1 PN; spare part	**6AG1591-1AB00-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1513F-1 PN

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Technical specifications

Article number	6AG1513-1FM03-2AB0 SIPLUS S7-1500 CPU 1513F-1 PN
General information	
Product type designation	CPU 1513F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	2.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6AG1513-1FM03-2AB0 SIPLUS S7-1500 CPU 1513F-1 PN
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160

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Technical specifications (continued)

Article number	6AG1513-1FM03-2AB0 SIPLUS S7-1500 CPU 1513F-1 PN
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes

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Technical specifications (continued)

Article number	6AG1513-1FM03-2AB0 SIPLUS S7-1500 CPU 1513F-1 PN
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	336 g

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Overview



- The CPU for applications with medium to high requirements for program/data memory in the S7-1500 Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages
- SIMATIC Memory Card required for operation of the CPU.

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1515F-2 PN (Extended temperature range and exposure to environmental substances) Fail-safe CPU, 1.5 MB work memory for program, 4.5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface; SIMATIC Memory Card required Temperature range -40 ... +60 °C	**6AG1515-2FN03-2AB0**
Accessories	
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) For SIPLUS CPU 1515F-2 PN; spare part	**6AG1591-1BB00-2AA0**
Other accessories	see SIMATIC S7-1500, CPU 1515F-2 PN/DP

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Technical specifications

Article number	6AG1515-2FN03-2AB0 SIPLUS S7-1500 CPU 1515F-2 PN
General information	
Product type designation	CPU 1515F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	4.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6AG1515-2FN03-2AB0 SIPLUS S7-1500 CPU 1515F-2 PN
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6AG1515-2FN03-2AB0 SIPLUS S7-1500 CPU 1515F-2 PN
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

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Technical specifications (continued)

Article number	6AG1515-2FN03-2AB0 SIPLUS S7-1500 CPU 1515F-2 PN
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized

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Technical specifications (continued)

Article number	6AG1515-2FN03-2AB0 SIPLUS S7-1500 CPU 1515F-2 PN
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	456 g

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Overview



- The CPU with a large program and data memory in the SIPLUS S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders.
- Integrated web server with the option of creating user-defined web pages.
- SIMATIC Memory Card required for operation of the CPU.

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1516F-3 PN/DP (Extended temperature range and exposure to environmental substances) Fail-safe CPU, 3 MB work memory for program, 7.5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC Memory Card required Temperature range -40 ... +60 °C	**6AG1516-3FP03-2AB0**
Accessories	
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) For SIPLUS CPU 1516F-3 PN/DP; spare part	**6AG1591-1BB00-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1516F-3 PN/DP

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Technical specifications

Article number	6AG1516-3FP03-2AB0 SIPLUS S7-1500 CPU 1516F-3 PN
General information	
Product type designation	CPU 1516F-3 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6AG1516-3FP03-2AB0 SIPLUS S7-1500 CPU 1516F-3 PN
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6AG1516-3FP03-2AB0 SIPLUS S7-1500 CPU 1516F-3 PN
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; X3
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160

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Technical specifications (continued)

Article number	6AG1516-3FP03-2AB0 SIPLUS S7-1500 CPU 1516F-3 PN
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	

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Technical specifications (continued)

Article number	6AG1516-3FP03-2AB0 SIPLUS S7-1500 CPU 1516F-3 PN
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	469 g

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Overview



- The CPU with a very large program and data memory in the SIPLUS S7-1500 Controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- Configurable performance boost (+25%)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- Two PROFINET IO IRT interfaces (X1 and X2), each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or third-party PROFINET IO controller
- PROFINET interface X3 with separate IP address for network separation and Gbit Ethernet to transmit data at a speed of 1 Gbps.
- OPC UA server and client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion Specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- Integrated SIMATIC Controller Profiling for analysis and evaluation of user program runtime behavior

Overview (continued)

Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1518F-3 PN (Exposure to environmental substances) With conformal coating, 0...+60 °C, central processing unit with 18 MB work memory for program and 150 MB work memory for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface, PROFINET IRT with 2-port switch, 3rd interface: Ethernet 0.3 ns bit performance, SIMATIC Memory Card required	**6AG1518-3FT10-4AB0**
Accessories	
SIPLUS S7-1500 Cooling Fan 175 mm (Extended temperature range and exposure to environmental substances) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AA01-7AA0**
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) for CPU 1518-4F PN/DP; spare part	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1518F-3 PN

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Technical specifications

Article number	6AG1518-3FT10-4AB0 SIPLUS S7-1500 CPU 1518F-3 PN/DP
General information	
Product type designation	CPU 1518F-3 PN
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	18 Mbyte
• integrated (for data)	150 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.3 ns
for word operations, typ.	0.8 ns
for fixed point arithmetic, typ.	0.8 ns
for floating point arithmetic, typ.	2.5 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program

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Technical specifications (continued)

Article number	6AG1518-3FT10-4AB0 SIPLUS S7-1500 CPU 1518F-3 PN/DP
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No

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Technical specifications (continued)

Article number	6AG1518-3FT10-4AB0 SIPLUS S7-1500 CPU 1518F-3 PN/DP
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	30 720
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves

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Technical specifications (continued)

Article number	6AG1518-3FT10-4AB0 SIPLUS S7-1500 CPU 1518F-3 PN/DP
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	0 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes

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Technical specifications (continued)

Article number	6AG1518-3FT10-4AB0 SIPLUS S7-1500 CPU 1518F-3 PN/DP
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 637 g

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Overview



- The CPU with a very large program and data memory in the SIPLUS S7-1500 Controller product range for fail-safe applications with highest requirements regarding program scope, performance and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes
- Integrated web server with the option of creating user-defined web pages.

Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1518F-4 PN/DP (Exposure to environmental substances) Fail-safe CPU, 6 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC Memory Card required	**6AG1518-4FP00-4AB0**
Accessories	
SIPLUS S7-1500 Cooling Fan 175 mm (Extended temperature range and exposure to environmental substances) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AA00-7AA0**
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances) for CPU 1518-4F PN/DP; spare part	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1518F-4 PN/DP

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Technical specifications

Article number	6AG1518-4FP00-4AB0 SIPLUS S7-1500 CPU 1518F-4 PN/DP
General information	
Product type designation	CPU 1518F-4PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	9 Mbyte
• integrated (for data)	60 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6AG1518-4FP00-4AB0 SIPLUS S7-1500 CPU 1518F-4 PN/DP
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6AG1518-4FP00-4AB0 SIPLUS S7-1500 CPU 1518F-4 PN/DP
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; as MRP redundancy manager and/or MRP client
- MRP interconnection, supported	Yes; as ring node according to IEC 62439-2 Edition 2.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space

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Technical specifications (continued)

Article number	6AG1518-4FP00-4AB0 SIPLUS S7-1500 CPU 1518F-4 PN/DP
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection

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Technical specifications (continued)

Article number	6AG1518-4FP00-4AB0 SIPLUS S7-1500 CPU 1518F-4 PN/DP
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Password for display	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 988 g

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Overview



- The CPU for applications with medium requirements for program scope and processing speed, and increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with distributed I/O
- PROFINET IO RT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500R, CPU 1513R-1PN Central processor unit with 600 KB work memory for program and 2.5 MB for data, 1st interface: PROFINET RT with 2-port switch, SIMATIC Memory Card required	**6ES7513-1RM03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	

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Selection and ordering data (continued)

Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack=50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
Display module 35 mm	
SIMATIC S7-1500, spare part Display module, 35 mm for S7-1500 CPUs	**6ES7591-1AB00-0AA0**
STEP 7 Professional V21 (required for S7-1500R/H) **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**

Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7513-1RM03-0AB0 CPU 1513R-1 PN, 600KB program/2,5MB data
General information	
Product type designation	CPU 1513R-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7513-1RL00-0AB0
Redundancy	
• stand-alone operation	Yes
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	2.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	20 ns
for word operations, typ.	24 ns
for fixed point arithmetic, typ.	32 ns
for floating point arithmetic, typ.	128 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	

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Technical specifications (continued)

Article number	6ES7513-1RM03-0AB0 CPU 1513R-1 PN, 600KB program/2,5MB data
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	64
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50; Only 16 are recommended, however
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	No
• OPC UA Server	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control
• Alarms and Conditions	No
Supported technology objects	
Motion Control	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	No
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes

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Technical specifications (continued)

Article number	6ES7513-1RM03-0AB0 CPU 1513R-1 PN, 600KB program/2,5MB data
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	336 g

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Overview



- The CPU for applications with medium/high requirements for program scope, networking and processing speed, and with increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500R, CPU 1515R-2 PN Central processing unit with 1 MB work memory for program and 4.5 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, SIMATIC Memory Card required	**6ES7515-2RN03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	

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Selection and ordering data (continued)

Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
STEP 7 Professional V21 (required for S7-1500R/H) **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**

Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7515-2RN03-0AB0 CPU 1515R-2 PN, 1MB program/ 4,5MB data
General information	
Product type designation	CPU 1515R-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515-2RM00-0AB0
Redundancy	
• stand-alone operation	Yes
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	1 Mbyte
• integrated (for data)	4.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	20 ns
for word operations, typ.	24 ns
for fixed point arithmetic, typ.	32 ns
for floating point arithmetic, typ.	128 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	

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Technical specifications (continued)

Article number	6ES7515-2RN03-0AB0 CPU 1515R-2 PN, 1MB program/ 4,5MB data
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	64
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50; Only 16 are recommended, however
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	No
• OPC UA Server	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control
• Alarms and Conditions	No
Supported technology objects	
Motion Control	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation

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Technical specifications (continued)

Article number	6ES7515-2RN03-0AB0 CPU 1515R-2 PN, 1MB program/ 4,5MB data
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	No
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	456 g

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Overview



- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP addresses
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500H, CPU 1517H-3 PN Central processing unit with 2 MB work memory for program and 8 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, 3rd/4th interface: H-SYNC, SIMATIC Memory Card required	**6ES7517-3HP00-0AB0**
SIMATIC S7-1500H, CPU 1517H system bundle Consisting of: 2 x CPU 1517H-3 PN (6ES7517-3HP00-0AB0), 4 sync modules up to 200 m (6ES7960-1CB00-0AA5), 2 x sync cables 1 m (6ES7960-1BB00-5AA5), without memory card	**6ES7500-0HP00-0AB0**
Accessories	
Synchronization modules	
SIMATIC S7-1500H synchronization module for patch cables Up to 200 m	**6ES7960-1CB00-0AA5**
SIMATIC S7-1500H synchronization module for fiber-optic cables Up to 10 km, fiber category OS1 or OS2, LC connector type	**6ES7960-1FB00-0AA5**
SIMATIC S7-1500H synchronization module for fiber-optic cables From 8 km to 40 km, fiber category OS2, connector type LC	**6ES7960-1FE00-0AA5**
FOC synchronization connecting cables FOC for S7-1500H	
SIMATIC S7-1500H sync fiber-optic connecting cable 1 m	**6ES7960-1BB00-5AA5**
SIMATIC S7-1500H sync fiber-optic connecting cable 2 m	**6ES7960-1BC00-5AA5**
SIMATIC S7-1500H sync fiber-optic connecting cable 10 m	**6ES7960-1CB00-5AA5**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**

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Selection and ordering data (continued)

SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
Display	
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 (required for S7-1500R/H) **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3HP00-0AB0 CPU 1517H-3 PN, 2MB program/8MB data
General information	
Product type designation	CPU 1517H-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V15.1 (FW V2.6) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	2 Mbyte
• integrated (for data)	8 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	4 ns
for word operations, typ.	6 ns
for fixed point arithmetic, typ.	6 ns
for floating point arithmetic, typ.	24 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- IRT	No

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Technical specifications (continued)

Article number	6ES7517-3HP00-0AB0 CPU 1517H-3 PN, 2MB program/8MB data
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	256
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
3. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7 960-1FE00-0AA5
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs
Redundancy mode	
- Media redundancy	
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	No
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	No
Supported technology objects	
Motion Control	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes
Security	
PROFINET Security Class	1

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Technical specifications (continued)

Article number	6ES7517-3HP00-0AB0 CPU 1517H-3 PN, 2MB program/8MB data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	No
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes
Dimensions	
Width	210 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	2 094 g; Interface modules: 2x 18 g

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Overview



Similar to figure

- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP addresses
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500H, CPU 1517H-4 PN Central processing unit with 4 MB work memory for program and 50 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET with 2-port switch, 3rd interface: PROFINET 4th/5th interface: H-SYNC, SIMATIC Memory Card required	**6ES7517-4HQ10-0AB0**
SIMATIC S7-1500H, CPU 1517H system bundle Consisting of: 2 x CPU 1517H-4 PN (6ES7517-4HQ10-0AB0), 4 sync modules up to 200 m (6ES7960-1CB00-0AA5), 2 x sync cables 1 m (6ES7960-1BB00-5AA5), without memory card	**6ES7500-0HQ00-0AB0**
Accessories	
Synchronization modules	
SIMATIC S7-1500H synchronization module for patch cables Up to 200 m	**6ES7960-1CB00-0AA5**
SIMATIC S7-1500H synchronization module for fiber-optic cables Up to 10 km, fiber category OS1 or OS2, LC connector type	**6ES7960-1FB00-0AA5**
SIMATIC S7-1500H synchronization module for fiber-optic cables From 8 km to 40 km, fiber category OS2, connector type LC	**6ES7960-1FE00-0AA5**
FOC synchronization connecting cables FOC for S7-1500H	
SIMATIC S7-1500H sync fiber-optic connecting cable 1 m	**6ES7960-1BB00-5AA5**
SIMATIC S7-1500H sync fiber-optic connecting cable 2 m	**6ES7960-1BC00-5AA5**
SIMATIC S7-1500H sync fiber-optic connecting cable 10 m	**6ES7960-1CB00-5AA5**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**

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Selection and ordering data (continued)

SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
Display	
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 (required for S7-1500R/H) **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-4HQ10-0AB0 CPU 1517H-4 PN, 4MB prog., 50MB data
General information	
Product type designation	CPU 1517H-4 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V20 (FW V4.0) or higher
Redundancy	
• stand-alone operation	No
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	4 Mbyte
• integrated (for data)	50 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	8 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	

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Technical specifications (continued)

Article number	6ES7517-4HQ10-0AB0 CPU 1517H-4 PN, 4MB prog., 50MB data
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO Device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5
5. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	No
• OPC UA Server	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control

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Technical specifications (continued)

Article number	6ES7517-4HQ10-0AB0 CPU 1517H-4 PN, 4MB prog., 50MB data
• Alarms and Conditions	No
Supported technology objects	
Motion Control	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	210 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 806 g; Interface modules: 2x 18 g

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Overview



- The CPU for applications with high availability requirements, also in connection with functional safety requirements
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- A very large program data memory enables the realization of extensive applications.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- Supports PROFIsafe in distributed configurations
- PROFINET IO RT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP addresses
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:
SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500H, CPU 1518HF-4 PN Central processing unit with 9 MB work memory for program and 60 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET with 2-port switch, 3rd interface: PROFINET, 4th/5th interface: H-SYNC, SIMATIC Memory Card required	**6ES7518-4JP00-0AB0**
SIMATIC S7-1500H, CPU 1518HF-4 PN Central processing unit with 18 MB work memory for program and 150 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET with 2-port switch, 3rd interface: PROFINET, 4th/5th interface: H-SYNC, SIMATIC Memory Card required	**6ES7518-4JT10-0AB0**
SIMATIC S7-1500HF, CPU 1518HF system bundle Consisting of: 2 x CPU 1518HF-4 PN (6ES7518-4JT10-0AB0), 4 sync modules up to 200 m (6ES7960-1CB00-0AA5), 2 x sync cables 1 m (6ES7960-1BB00-5AA5), without memory card	**6ES7500-0JP00-0AB0**
SIMATIC S7-1500HF, CPU 1518HF system bundle Consisting of: 2 x CPU 1518HF-4 PN (6ES7518-4JP00-0AB0), 4 sync modules up to 200 m (6ES7960-1CB00-0AA5), 2 x sync cables 1 m (6ES7960-1BB00-5AA5), without memory card	**6ES7500-0JT00-0AB0**
Accessories	
Synchronization modules	
SIMATIC S7-1500H synchronization module for patch cables up to 200 m	**6ES7960-1CB00-0AA5**
SIMATIC S7-1500H synchronization module for fiber-optic cables up to 10 km Fiber category OS1 or OS2, connector type LC	**6ES7960-1FB00-0AA5**
SIMATIC S7-1500H synchronization module for fiber-optic cables from 8 km to 40 km Fiber category OS2, connector type LC	**6ES7960-1FE00-0AA5**
FOC synchronization connecting cables FOC for S7-1500H	
SIMATIC S7-1500H sync fiber-optic connecting cable 1 m	**6ES7960-1BB00-5AA5**
SIMATIC S7-1500H sync fiber-optic connecting cable 2 m	**6ES7960-1BC00-5AA5**
SIMATIC S7-1500H sync fiber-optic connecting cable 10 m	**6ES7960-1CB00-5AA5**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**

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Selection and ordering data (continued)

SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**

Selection and ordering data (continued)

SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-4JP00-0AB0 CPU 1518HF-4 PN, 9MB program/60MB data	6ES7518-4JT10-0AB0 CPU 1518HF-4 PN, 18MB prog., 150MB data
General information		
Product type designation	CPU 1518HF-4PN	CPU 1518HF-4 PN
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V17 (FW V2.9) or higher	V21 (FW V4.1) / V20 (FW V4.0) or higher
Redundancy		
• stand-alone operation		No
Display		
Screen diagonal [cm]	6.1 cm	6.1 cm
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	9 Mbyte	18 Mbyte
• integrated (for data)	60 Mbyte	150 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	4 ns	1 ns
for word operations, typ.	6 ns	2 ns
for fixed point arithmetic, typ.	6 ns	2 ns
for floating point arithmetic, typ.	24 ns	8 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	No	No
• SIMATIC communication	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes

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Technical specifications (continued)

Article number	6ES7518-4JP00-0AB0 CPU 1518HF-4 PN, 9MB program/60MB data	6ES7518-4JT10-0AB0 CPU 1518HF-4 PN, 18MB prog., 150MB data
PROFINET IO Controller		
- Services		
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	256	512
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	
2. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X2	Yes; X2
• Number of ports	1	2
• integrated switch	No	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	No	No
• PROFINET IO device	No	No
• SIMATIC communication	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No
3. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X3	Yes; X3
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	No	No
• PROFINET IO device	No	No
• SIMATIC communication	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
4. Interface		
Interface type	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5
5. Interface		
Interface type	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5	Synchronization module 6ES7960-1CB00-0AA5, 6ES7960-1FB00-0AA5 or 6ES7960-1FE00-0AA5
Protocols		
Number of connections		
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs	384; via integrated interfaces of the CPU and connected CPs
Redundancy mode		
- Media redundancy		
- Media redundancy	only via 1st interface (X1)	Yes; only via 1st interface (X1)

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Technical specifications (continued)

Article number	6ES7518-4JP00-0AB0 CPU 1518HF-4 PN, 9MB program/60MB data	6ES7518-4JT10-0AB0 CPU 1518HF-4 PN, 18MB prog., 150MB data
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	No	No
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control
• Alarms and Conditions	No	No
Supported technology objects		
Motion Control	No	No
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes	Yes
Security		
PROFINET Security Class	1	1
signed firmware update		Yes
Secure Boot		Yes
safely removing data		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	No	No
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes	Yes; device-wide and centralized
• Number of users		100
Dimensions		
Width	210 mm	210 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm

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Technical specifications (continued)

Article number	6ES7518-4JP00-0AB0 CPU 1518HF-4 PN, 9MB program/60MB data	6ES7518-4JT10-0AB0 CPU 1518HF-4 PN, 18MB prog., 150MB data
Weights		
Weight, approx.	2 116 g	1 806 g; Interface modules: 2x 18 g

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Overview



- The CPU for applications with medium/high requirements for program scope, networking and processing speed, and with increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as central PLC with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS s7-1500 CPU 1515R-2 PN (Extended temperature range and exposure to environmental substances) Central processing unit with 1 MB work memory for program and 4.5 MB work memory for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET; SIMATIC Memory Card required, with conformal coating -40...+70 °C	**6AG1515-2RN03-7AB0**
Accessories	
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8A	**6AG1333-4BA00-7AA0**
Replacement display for CPU, front flap	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1515R-2 PN

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Technical specifications

Article number	6AG1515-2RN03-7AB0 SIPLUS S7-1500 CPU 1515R-2 PN
General information	
Product type designation	CPU 1515R-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Redundancy	
• stand-alone operation	Yes
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	1 Mbyte
• integrated (for data)	4.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	20 ns
for word operations, typ.	24 ns
for fixed point arithmetic, typ.	32 ns
for floating point arithmetic, typ.	128 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	

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Technical specifications (continued)

Article number	6AG1515-2RN03-7AB0 SIPLUS S7-1500 CPU 1515R-2 PN
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	64
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50; Only 16 are recommended, however
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	No
• OPC UA Server	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control
• Alarms and Conditions	No
Supported technology objects	
Motion Control	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)

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Technical specifications (continued)

Article number	6AG1515-2RN03-7AB0 SIPLUS S7-1500 CPU 1515R-2 PN
• horizontal installation, max.	70 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	No
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	520 g

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Overview



- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1517H-3 PN (Extended temperature range and exposure to environmental substances) SIPLUS S7-1500H CPU, 2 MB work memory for program, 8 MB for data, 1st interface PROFINET RT with 2-port switch, 2nd interface PROFINET RT, 3rd interface synchronization, command times for bit operations 4 ns; SIMATIC Memory Card required	**6AG1517-3HP00-4AB0**
SIPLUS S7-1500 CPU 1517H System Bundle (Extended temperature range and exposure to environmental substances) Comprising 2 SIPLUS CPU 1517H-3 PN, 4 SIPLUS synchronization modules up to 10 m, 2 FOC synchronization cables (1 m); without memory card	**6AG1500-0HP00-4AB0**
Accessories	
SIPLUS S7-1500 cooling fan 210 mm (Extended temperature range and exposure to environmental substances) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AB00-7AA0**
Synchronization modules (Extended temperature range and exposure to environmental substances)	
• For patch cable FOC up to 10 m	**6AG1960-1CB00-4AA5**
• For routing cable FOC up to 10 km	**6AG1960-1FB00-4AA5**
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Replacement display for CPU, front flap	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1517H-3 PN

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Technical specifications

Article number	6AG1517-3HP00-4AB0 SIPLUS S7-1500 CPU 1517H-3 PN
General information	
Product type designation	CPU 1517H-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	2 Mbyte
• integrated (for data)	8 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	4 ns
for word operations, typ.	6 ns
for fixed point arithmetic, typ.	6 ns
for floating point arithmetic, typ.	24 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- IRT	No

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Technical specifications (continued)

Article number	6AG1517-3HP00-4AB0 SIPLUS S7-1500 CPU 1517H-3 PN
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	256
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
3. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs
Redundancy mode	
- Media redundancy	
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	No
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	No
Supported technology objects	
Motion Control	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes
Security	
PROFINET Security Class	1

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Technical specifications (continued)

Article number	6AG1517-3HP00-4AB0 SIPLUS S7-1500 CPU 1517H-3 PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	0 °C; = Tmin
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	No
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes
Dimensions	
Width	210 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	2 094 g; Interface modules: 2x 18 g

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Overview



- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1517H-4 PN (Extended temperature range and exposure to environmental substances) Work memory 4 MB for program and 50 MB for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, 3rd interface: PROFINET, 4th/5th interface: H-SYNC, SIMATIC Memory Card required	**6AG1517-4HQ10-4AB0**
SIPLUS S7-1500 CPU 1517H System Bundle (Extended temperature range and exposure to environmental substances) Comprising 2 SIPLUS CPU 1517H-4 PN, 4 SIPLUS synchronization modules up to 10 m, 2 FOC synchronization cables (1 m); without memory card	**6AG1500-0HQ00-4AB0**
Accessories	
SIPLUS S7-1500 Cooling Fan 210 mm (Extended temperature range and exposure to environmental substances) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AB01-7AA0**
Synchronization modules (Extended temperature range and exposure to environmental substances)	
• For patch cable FOC up to 10 m	**6AG1960-1CB00-4AA5**
• For routing cable FOC up to 10 km	**6AG1960-1FB00-4AA5**
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Replacement display for CPU, front flap	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1517H-4 PN

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Technical specifications

Article number	6AG1517-4HQ10-4AB0 SIPLUS S7-1500 CPU 1517H-4 PN
General information	
Product type designation	CPU 1517H-4 PN
Redundancy	
• stand-alone operation	No
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	4 Mbyte
• integrated (for data)	50 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	8 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- IRT	No

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Technical specifications (continued)

Article number	6AG1517-4HQ10-4AB0 SIPLUS S7-1500 CPU 1517H-4 PN
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	256
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• SIMATIC communication	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5
5. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	No
• OPC UA Server	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control
• Alarms and Conditions	No

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Technical specifications (continued)

Article number	6AG1517-4HQ10-4AB0 SIPLUS S7-1500 CPU 1517H-4 PN
Supported technology objects	
Motion Control	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	0 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	No
• Block protection	Yes
Access protection	

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Technical specifications (continued)

Article number	6AG1517-4HQ10-4AB0 SIPLUS S7-1500 CPU 1517H-4 PN
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	210 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 806 g; Interface modules: 2x 18 g

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Overview



- The CPU for applications with high availability requirements, also in connection with functional safety requirements.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- A very large program data memory enables the realization of extensive applications
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- Supports PROFIsafe in distributed configurations
- PROFINET IO RT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP addresses
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:
SIMATIC Memory Card required for operation of the CPU.
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1518HF-4 PN With conformal coating CPU with 9 MB work memory for program and 60 MB work memory for data, 1st interface: PROFINET RT with 2-port switch, 2nd interface: PROFINET, 3rd interface: PROFINET, 4th/5th interface: H-SYNC; SIMATIC Memory Card required	**6AG1518-4JP00-4AB0**
SIPLUS CPU 1518HF-4 PN With conformal coating Central processing unit with work memory 18 MB for program and 150 MB for data, 1st interface: PROFINET IR with 2-port switch, 2nd interface, PROFINET with 2-port switch, 3rd interface: PROFINET, 4th/5th interface: H-SYNC, SIMATIC Memory Card required	**6AG1518-4JT10-4AB0**
SIPLUS S7-1500 CPU 1518HF system bundle With conformal coating, system bundle consisting of: 2x CPU 1518HF-4 PN, 4x sync submodules up to 200 m. 2x sync connecting cable FOC 1 m, without Memory C	**6AG1500-0JT00-4AB0**
Accessories	
SIPLUS S7-1500 Cooling Fan 210 mm (Extended temperature range) Fan module for the operation of a SIPLUS S7-1500 CPU at locations with an ambient temperature of up to +70 °C	**6AG1593-0AB00-7AA0**
Synchronization modules (Extended temperature range and exposure to environmental substances)	
• For patch cable FOC up to 10 m	**6AG1960-1CB00-4AA5**
• For routing cable FOC up to 10 km	**6AG1960-1FB00-4AA5**
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load current supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Replacement display for CPU, front flap	**6AG1591-1BA02-2AA0**
Other accessories	See SIMATIC S7-1500, CPU 1518HF-4 PN

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Technical specifications

Article number	6AG1518-4JP00-4AB0 SIPLUS S7-1500 CPU 1518HF-4 PN	6AG1518-4JT10-4AB0 SIPLUS S7-1500 CPU 1518HF-4 PN
General information		
Product type designation	CPU 1518HF-4PN	CPU 1518HF-4 PN
Redundancy		
• stand-alone operation		No
Display		
Screen diagonal [cm]	6.1 cm	6.1 cm
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	9 Mbyte	18 Mbyte
• integrated (for data)	60 Mbyte	150 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	4 ns	1 ns
for word operations, typ.	6 ns	2 ns
for fixed point arithmetic, typ.	6 ns	2 ns
for floating point arithmetic, typ.	24 ns	8 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1	Yes; X1
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	No	No
• SIMATIC communication	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	No	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	No	No

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Technical specifications (continued)

Article number	6AG1518-4JP00-4AB0 SIPLUS S7-1500 CPU 1518HF-4 PN	6AG1518-4JT10-4AB0 SIPLUS S7-1500 CPU 1518HF-4 PN
- IRT	No	No
- Dynamic Frame Packing (DFP)	Yes	
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	
- Number of connectable IO Devices, max.	256	256
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
2. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X2	Yes; X2
• Number of ports	1	2
• integrated switch	No	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	No	No
• PROFINET IO device	No	No
• SIMATIC communication	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No
3. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X3	Yes; X3
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	No	
• PROFINET IO device	No	
• SIMATIC communication	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
4. Interface		
Interface type	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5
5. Interface		
Interface type	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5	Synchronization module 6AG1960-1CB00-4AA5 or 6AG1960-1FB00-4AA5
Protocols		
Number of connections		
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs	384; via integrated interfaces of the CPU and connected CPs
Redundancy mode		
- Media redundancy		
- Media redundancy	only via 1st interface (X1)	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No	No
- Switchover time on line break, typ.	200 ms; PROFINET MRP	200 ms; PROFINET MRP

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Technical specifications (continued)

Article number	6AG1518-4JP00-4AB0 SIPLUS S7-1500 CPU 1518HF-4 PN	6AG1518-4JT10-4AB0 SIPLUS S7-1500 CPU 1518HF-4 PN
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	No	No
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; data access (read, write, subscribe), method call, custom address space, role-based access control
• Alarms and Conditions	No	No
Supported technology objects		
Motion Control	No	No
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Yes	Yes
Security		
PROFINET Security Class	1	1
signed firmware update		Yes
Secure Boot		Yes
safely removing data		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C
• vertical installation, min.	0 °C	0 °C; = Tmin
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; = Tmax; display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)

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Technical specifications (continued)

Article number	6AG1518-4JP00-4AB0 SIPLUS S7-1500 CPU 1518HF-4 PN	6AG1518-4JT10-4AB0 SIPLUS S7-1500 CPU 1518HF-4 PN
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	No	No
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes	Yes; device-wide and centralized
• Number of users		100
Dimensions		
Width	210 mm	210 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	2 116 g	1 806 g

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Overview



- Entry-level CPU in the S7-1500T Controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

SIMATIC S7-1500T, CPU 1511T-1 PN Central processing unit with 450 KB work memory for program and 1.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 6 ns bit performance, SIMATIC Memory Card required	**6ES7511-1TL03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 35 mm for S7-1500 CPUs	**6ES7591-1AB10-0AA0**
SIMATIC S7-1500, spare part, cover flap 35 mm with cutout for display and display control keys	**6ES7591-4AB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7511-1TL03-0AB0 CPU 1511T-1PN, 450KB Prog., 1.5MB Data
General information	
Product type designation	CPU 1511T-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7511-1TK01-0AB0
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	450 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7511-1TL03-0AB0 CPU 1511T-1PN, 450KB Prog., 1.5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20

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Technical specifications (continued)

Article number	6ES7511-1TL03-0AB0 CPU 1511T-1PN, 450KB Prog., 1.5MB Data
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	90
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	336 g

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Overview



- Entry-level CPU in the S7-1500T Controller product range
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500T, CPU 1511TF-1 PN Central processing unit with 450 KB work memory for program and 1.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 6 ns bit performance, SIMATIC Memory Card required	**6ES7511-1UL03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 35 mm for S7-1500 CPUs	**6ES7591-1AB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 35 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4AB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7511-1UL03-0AB0 CPU 1511TF-1PN, 450KB Prg., 1.5MB Data
General information	
Product type designation	CPU 1511TF-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7511-1UK01-0AB0
Display	
Screen diagonal [cm]	3.45 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	450 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7511-1UL03-0AB0 CPU 1511TF-1PN, 450KB Prg., 1.5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160

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Technical specifications (continued)

Article number	6ES7511-1UL03-0AB0 CPU 1511TF-1PN, 450KB Prg., 1.5MB Data
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	90
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm

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Technical specifications (continued)

Article number	6ES7511-1UL03-0AB0 CPU 1511TF-1PN, 450KB Prg., 1.5MB Data
Weights	
Weight, approx.	336 g

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Overview



- The CPU for applications with medium to high requirements regarding program/data storage in the S7-1500T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Overview (continued)

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500T, CPU 1515T-2 PN Central processing unit with 1.5 MB work memory for program and 4.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required	**6ES7515-2TN03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool, Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7515-2TN03-0AB0 CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data
General information	
Product type designation	CPU 1515T-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7515-2TM01-0AB0
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	4.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7515-2TN03-0AB0 CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	

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Technical specifications (continued)

Article number	6ES7515-2TN03-0AB0 CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data
- Services	
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No

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Technical specifications (continued)

Article number	6ES7515-2TN03-0AB0 CPU 1515T-2 PN, 1.5MB Progr, 4.5MB Data
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	456 g

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Overview



- The CPU for standard and fail-safe applications with medium to high requirements regarding program/data storage in the S7-1500T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Isochronous mode centrally and distributed
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers

Overview (continued)

- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500T, CPU 1515TF-2 PN Central processing unit with 1.5 MB work memory for program and 4.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required	**6ES7515-2UN03-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part, display module 70 mm for S7-1500 CPUs	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500, spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs, 5 units per packing unit	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7515-2UN03-0AB0 CPU 1515TF-2 PN, 1.5MB Progr, 4.5MB Data
General information	
Product type designation	CPU 1515TF-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7515-2UM01-0AB0
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	4.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7515-2UN03-0AB0 CPU 1515TF-2 PN, 1.5MB Progr, 4.5MB Data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7515-2UN03-0AB0 CPU 1515TF-2 PN, 1.5MB Progr, 4.5MB Data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30

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Technical specifications (continued)

Article number	6ES7515-2UN03-0AB0 CPU 1515TF-2 PN, 1.5MB Progr, 4.5MB Data
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	456 g

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Overview



- The CPU with a large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Two PROFINET IO IRT interfaces, each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500T, CPU 1516T-3 PN Central processing unit with 3 MB work memory for program and 25 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET IRT with 2-port switch, 3rd interface, PROFINET basic services 1.2 ns bit performance, SIMATIC Memory Card required	**6ES7516-3TP10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display module For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500 spare part, cover flap, 70 mm with cutout for displays and display control keys, for S7-1500 CPUs	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7516-3TP10-0AB0 CPU 1516T-3 PN, 3MB prog., 25MB data
General information	
Product type designation	CPU 1516T-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V20 (FW V4.0) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	25 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1.2 ns
for word operations, typ.	2.6 ns
for fixed point arithmetic, typ.	2.6 ns
for floating point arithmetic, typ.	7.6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7516-3TP10-0AB0 CPU 1516T-3 PN, 3MB prog., 25MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7516-3TP10-0AB0 CPU 1516T-3 PN, 3MB prog., 25MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	12 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6ES7516-3TP10-0AB0 CPU 1516T-3 PN, 3MB prog., 25MB data
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	540
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	Yes
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 499 g

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Overview



- The CPU with a large program and data memory in the S7-1500 Controller product range for standard and fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Two PROFINET IO IRT interfaces, each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Overview (continued)

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500TF, CPU 1516TF-3 PN Central processing unit with 3 MB work memory for program and 25 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET IRT with 2-port switch, 3rd Interface, PROFINET basic services, 1.2 ns bit performance, SIMATIC Memory Card required	**6ES7516-3UP10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display module For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BB00-0AA0**

Selection and ordering data (continued)

SIMATIC S7-1500 spare part, cover flap, 70 mm with cutout for displays and display control keys, for S7-1500 CPUs	**6ES7591-4BB00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7516-3UP10-0AB0 CPU 1516TF-3 PN, 3MB prog., 25MB data
General information	
Product type designation	CPU 1516TF-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0)
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	25 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1.2 ns
for word operations, typ.	2.6 ns
for fixed point arithmetic, typ.	2.6 ns
for floating point arithmetic, typ.	7.6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7516-3UP10-0AB0 CPU 1516TF-3 PN, 3MB prog., 25MB data
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	

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Technical specifications (continued)

Article number	6ES7516-3UP10-0AB0 CPU 1516TF-3 PN, 3MB prog., 25MB data
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	12 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	540

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Technical specifications (continued)

Article number	6ES7516-3UP10-0AB0 CPU 1516TF-3 PN, 3MB prog., 25MB data
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 499 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Two PROFINET IO IRT interfaces, each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500T, CPU 1517T-3 PN Central processing unit with 6 MB work memory for program and 50 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET IRT with 2-port switch, 3rd interface: PROFINET basic services, 0.6 ns bit performance, SIMATIC Memory Card required	**6ES7517-3TQ10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display module For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500 spare part, cover flap, 70 mm with cutout for displays and display control keys, for S7-1500 CPUs	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download1) Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3TQ10-0AB0 CPU 1517T-3 PN, 6MB prog., 50MB data
General information	
Product type designation	CPU 1517T-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V20 (FW V4.0) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	6 Mbyte
• integrated (for data)	50 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.6 ns
for word operations, typ.	1.3 ns
for fixed point arithmetic, typ.	1.3 ns
for floating point arithmetic, typ.	3.8 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7517-3TQ10-0AB0 CPU 1517T-3 PN, 6MB prog., 50MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7517-3TQ10-0AB0 CPU 1517T-3 PN, 6MB prog., 50MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	20 480
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6ES7517-3TQ10-0AB0 CPU 1517T-3 PN, 6MB prog., 50MB data
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	720
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	Yes
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 499 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Two PROFINET IO IRT interfaces, each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Overview (continued)

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500TF, CPU 1517TF-3 PN Central processing unit with 6 MB work memory for program and 50 MB for data 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET IRT with 2-port switch, 3rd interface: PROFINET basic services 0.6 ns bit performance, SIMATIC Memory Card required	**6ES7517-3UQ10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display module For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500 spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs	**6ES7591-4BB00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 Windows 11 Enterprise 24H2 Windows 11 Enterprise 24H2 LTSC Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3UQ10-0AB0 CPU 1517TF-3 PN, 6MB prog., 50MB data
General information	
Product type designation	CPU 1517TF-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V20 (FW V4.0) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	6 Mbyte
• integrated (for data)	50 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.6 ns
for word operations, typ.	1.3 ns
for fixed point arithmetic, typ.	1.3 ns
for floating point arithmetic, typ.	3.8 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7517-3UQ10-0AB0 CPU 1517TF-3 PN, 6MB prog., 50MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7517-3UQ10-0AB0 CPU 1517TF-3 PN, 6MB prog., 50MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	20 480
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6ES7517-3UQ10-0AB0 CPU 1517TF-3 PN, 6MB prog., 50MB data
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	720
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	Yes
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	Yes
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 499 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Two PROFINET IO IRT interfaces, each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.

Overview (continued)

- S7-1500T Motion Control KinPlus
  With "S7-1500T Motion Control KinPlus", kinematics with up to 6 interpolating axes can be controlled.
  - Predefined kinematics:
    Cartesian portal 3D with 2 orientations,
    Delta picker 3D with 2 orientations,
    6-axis articulated arm with central hand,
    6-axis articulated arm with angular hand.
  - User-defined kinematics 3D with 3 orientations
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

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Selection and ordering data

SIMATIC S7-1500T, CPU 1518T-3 PN Central processing unit with 18 MB work memory for program and 150 MB for data 1st interface: PROFINET IRT with 2-port switch 2nd interface: PROFINET IRT with 2-port switch 3rd interface: PROFINET basic services 0.3 ns bit performance, SIMATIC Memory Card required	**6ES7518-3TT10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
S7-1500T Motion Control KinPlus	
S7-1500T Motion Control KinPlus Runtime software Without documentation class A executable under T-CPU 1518 T//TF Download product, available only in the EU Consignee email address required for delivery The SD card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution, suitable for firmware 4.0	**6ES7823-0KE02-1AA0**
S7-1500T Motion Control KinPlus Runtime software Without documentation class A, executable under T-CPU 1518 T/TF Supplied on USB flash drive. The SD card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution; suitable for firmware V4.0	**6ES7823-0KU02-1AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 2 GB	**6ES7954-8LP80-0AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 32 GB	**6ES7954-8LT80-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**

Selection and ordering data (continued)

SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**

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Selection and ordering data (continued)

Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display module For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500 spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs	**6ES7591-4BB00-0AA0**
STEP 7 Professional V2 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-3TT10-0AB0 CPU 1518T-3 PN, 18MB prog., 150MB data
General information	
Product type designation	CPU 1518T-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V20 (FW V4.0) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	18 Mbyte
• integrated (for data)	150 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.3 ns
for word operations, typ.	0.8 ns
for fixed point arithmetic, typ.	0.8 ns
for floating point arithmetic, typ.	2.5 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7518-3TT10-0AB0 CPU 1518T-3 PN, 18MB prog., 150MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7518-3TT10-0AB0 CPU 1518T-3 PN, 18MB prog., 150MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	30 720
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20

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Technical specifications (continued)

Article number	6ES7518-3TT10-0AB0 CPU 1518T-3 PN, 18MB prog., 150MB data
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	1 560
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	Yes
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 637 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Two PROFINET IO IRT interfaces, each with a 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.

Overview (continued)

- S7-1500T Motion Control KinPlus
  With "S7-1500T Motion Control KinPlus", kinematics with up to 6 interpolating axes can be controlled.
  - Predefined kinematics:
    Cartesian portal 3D with 2 orientations,
    Delta picker 3D with 2 orientations,
    6-axis articulated arm with central hand,
    6-axis articulated arm with angular hand.
  - User-defined kinematics 3D with 3 orientations
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

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Selection and ordering data

SIMATIC S7-1500TF, CPU 1518TF-3 PN Central processing unit with 9 MB work memory for program and 60 MB for data 1st interface: PROFINET IRT with 2-port switch 2nd interface: PROFINET IRT with 2-port switch 3rd interface: PROFINET basic services 0.3 ns bit performance, SIMATIC Memory Card required	**6ES7518-3UT10-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
S7-1500T Motion Control KinPlus	
S7-1500T Motion Control KinPlus Runtime software Without documentation, class A, executable under T-CPU 1518 T//TF, download product, available only in the EU, consignee email address required for delivery The SD card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution, suitable for firmware 4.0	**6ES7823-0KE02-1AA0**
S7-1500T Motion Control KinPlus Runtime software Without documentation class A, executable under T-CPU 1518 T/TF Supplied on USB flash drive. The SD card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution; suitable for firmware V4.0	**6ES7823-0KU02-1AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 2 GB	**6ES7954-8LP80-0AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 32 GB	**6ES7954-8LT80-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**

Selection and ordering data (continued)

SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**

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Selection and ordering data (continued)

Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display module For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BB00-0AA0**
SIMATIC S7-1500 spare part, cover flap 70 mm with cutout for displays and display control keys, for S7-1500 CPUs	**6ES7591-4BB00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**

Selection and ordering data (continued)

STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
SIMATIC Manual Collection DL in 5 languages1) All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-3UT10-0AB0 CPU 1518TF-3 PN, 18MB prog., 150MB data
General information	
Product type designation	CPU 1518TF-3 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V20 (FW V4.0) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	18 Mbyte
• integrated (for data)	150 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	0.3 ns
for word operations, typ.	0.8 ns
for fixed point arithmetic, typ.	0.8 ns
for floating point arithmetic, typ.	2.5 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7518-3UT10-0AB0 CPU 1518TF-3 PN, 18MB prog., 150MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	512; in total, up to 1661 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7518-3UT10-0AB0 CPU 1518TF-3 PN, 18MB prog., 150MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	Yes
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	via the X1 or X2 interface
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	30 720
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20

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Technical specifications (continued)

Article number	6ES7518-3UT10-0AB0 CPU 1518TF-3 PN, 18MB prog., 150MB data
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	1 560
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	Yes
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	Yes
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 637 g

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Overview



- The CPU with a large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics

Overview (continued)

- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500T, CPU 1516T-3 PN/DP Central processing unit with 3 MB work memory for program and 7.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface, Ethernet, 3rd interface, PROFIBUS, 6 ns bit performance, SIMATIC Memory Card required	**6ES7516-3TN00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket For use environments subject to harsh chemicals and mechanical stress, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**

Selection and ordering data (continued)

PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover For DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**

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Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7516-3TN00-0AB0 CPU 1516T-3 PN/DP, 3MB prog./7.5MB data
General information	
Product type designation	CPU 1516T-3 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V15 (FW V2.5) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7516-3TN00-0AB0 CPU 1516T-3 PN/DP, 3MB prog./7.5MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7516-3TN00-0AB0 CPU 1516T-3 PN/DP, 3MB prog./7.5MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; X3
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	6 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6ES7516-3TN00-0AB0 CPU 1516T-3 PN/DP, 3MB prog./7.5MB data
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	192
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 929 g

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Overview



- The CPU with a large program and data memory in the S7-1500 Controller product range for standard and fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.

Overview (continued)

- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500TF, CPU 1516TF-3 PN/DP Central processing unit with 3 MB work memory for program and 7.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface, Ethernet, 3rd interface, PROFIBUS, 6 ns bit performance, SIMATIC Memory Card required	**6ES7516-3UN00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Including grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays, for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**

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Selection and ordering data (continued)

SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket For use environments subject to harsh chemicals and mechanical stress, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**

Selection and ordering data (continued)

PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover For DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**

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Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 3MB prog./7.5MB data
General information	
Product type designation	CPU 1516TF-3 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V15 (FW V2.5) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 3MB prog./7.5MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 3MB prog./7.5MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; X3
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	6 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 3MB prog./7.5MB data
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	192
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 929 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers

Overview (continued)

- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500T, CPU 1517T-3 PN/DP Central processing unit with 3 MB work memory for program and 8 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface, Ethernet, 3rd interface, PROFIBUS, 2 ns bit performance, SIMATIC Memory Card required	**6ES7517-3TP00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket for use in environments subject to harsh chemicals and mechanical stress 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable PROFIBUS trailing cable, max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable PROFIBUS trailing cable, max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**

Selection and ordering data (continued)

PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover For DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	

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Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3TP00-0AB0 CPU 1517T-3 PN/DP, 3MB prog./8MB data
General information	
Product type designation	CPU 1517T-3 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V18 (FW V3.0) / V14 (FW V2.0) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	8 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	2 ns
for word operations, typ.	3 ns
for fixed point arithmetic, typ.	3 ns
for floating point arithmetic, typ.	12 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7517-3TP00-0AB0 CPU 1517T-3 PN/DP, 3MB prog./8MB data
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	

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Technical specifications (continued)

Article number	6ES7517-3TP00-0AB0 CPU 1517T-3 PN/DP, 3MB prog./8MB data
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RS 485	Yes; X3
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
• Web server	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	10 240
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	256
• Required Extended Motion Control resources	

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Technical specifications (continued)

Article number	6ES7517-3TP00-0AB0 CPU 1517T-3 PN/DP, 3MB prog./8MB data
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 929 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics

Overview (continued)

- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

SIMATIC S7-1500TF, CPU 1517TF-3 PN/DP Central processing unit with 3 MB work memory for program and 8 MB for data 1st interface: PROFINET IRT with 2-port switch 2nd interface, Ethernet 3rd interface, PROFIBUS 2 ns bit performance, SIMATIC Memory Card required	**6ES7517-3UP00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	

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Selection and ordering data (continued)

SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket For use environments subject to harsh chemicals and mechanical stress, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**

Selection and ordering data (continued)

PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover For DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) Windows Server 2022 Standard (full installation) Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	

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Selection and ordering data (continued)

SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
General information	
Product type designation	CPU 1517TF-3 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V14 (FW V2.0) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	8 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	2 ns
for word operations, typ.	3 ns
for fixed point arithmetic, typ.	3 ns
for floating point arithmetic, typ.	12 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; X3
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	10 240
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80

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Technical specifications (continued)

Article number	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	256
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	Yes; optional, SIMATIC Safe Kinematics V17 or higher
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 929 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.

Overview (continued)

- S7-1500T Motion Control KinPlus
  With "S7-1500T Motion Control KinPlus", kinematics with up to 6 interpolating axes can be controlled.
  - Predefined kinematics:
    Cartesian portal 3D with 2 orientations,
    Delta picker 3D with 2 orientations,
    6-axis articulated arm with central hand,
    6-axis articulated arm with angular hand.
  - User-defined kinematics 3D with 3 orientations
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

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Selection and ordering data

SIMATIC S7-1500T, CPU 1518T-4 PN/DP Central processing unit with 9 MB work memory for program and 60 MB for data 1st interface: PROFINET IRT with 2-port switch 2nd interface: PROFINET RT 3rd interface: PROFINET basic services 4th interface: PROFIBUS 1 ns bit performance, SIMATIC Memory Card required	**6ES7518-4TP00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
S7-1500T Motion Control KinPlus	
S7-1500T Motion Control KinPlus Runtime software without documentation Class A runs under T-CPU 1518 T/TF DriveController 1507D TF Download product[1)] Consignee email address required for delivery The SD card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution	**6ES7823-0KE03-1AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 2 GB	**6ES7954-8LP80-0AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 32 GB	**6ES7954-8LT80-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**

Selection and ordering data (continued)

SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket For use environments subject to harsh chemicals and mechanical stress, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**

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Selection and ordering data (continued)

PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable GP 2x2 (PROFINET type A), TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable 2x2 (PROFINET type C), TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover For DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-4TP00-0AB0 CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
General information	
Product type designation	CPU 1518T-4 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V17 (FW V2.9) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	9 Mbyte
• integrated (for data)	60 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7518-4TP00-0AB0 CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7518-4TP00-0AB0 CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call

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Technical specifications (continued)

Article number	6ES7518-4TP00-0AB0 CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	512
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	Yes; only with S7-1500T Motion Control KinPlus, as of TIA Portal V18 / FW V3.0
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes

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Technical specifications (continued)

Article number	6ES7518-4TP00-0AB0 CPU 1518T-4 PN/DP, 9MB Prog., 60MB data
• User administration	Yes; device-wide
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	2 079 g

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Overview



- The CPU with a very large program and data memory in the S7-1500 Controller product range for fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- PROFIBUS DP master interface
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
  User-defined kinematics are also supported.

Overview (continued)

- S7-1500T Motion Control KinPlus
  With "S7-1500T Motion Control KinPlus", kinematics with up to 6 interpolating axes can be controlled.
  - Predefined kinematics:
    Cartesian portal 3D with 2 orientations,
    Delta picker 3D with 2 orientations,
    6-axis articulated arm with central hand,
    6-axis articulated arm with angular hand.
  - User-defined kinematics 3D with 3 orientations
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

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Selection and ordering data

SIMATIC S7-1500TF, CPU 1518TF-4 PN/DP Central processing unit with 9 MB work memory for program and 60 MB for data 1st interface: PROFINET IRT with 2-port switch 2nd interface: PROFINET RT 3rd interface: PROFINET basic services 4th interface: PROFIBUS 1 ns bit performance, SIMATIC Memory Card required	**6ES7518-4UP00-0AB0**
Accessories	
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
S7-1500T Motion Control KinPlus	
S7-1500T Motion Control KinPlus Runtime software without documentation Class A runs under T-CPU 1518 T/TF DriveController 1507D TF Download product[1)] Consignee email address required for delivery The SD card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution	**6ES7823-0KE03-1AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 2 GB	**6ES7954-8LP80-0AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 32 GB	**6ES7954-8LT80-0AA0**
SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**

Selection and ordering data (continued)

SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A, stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC, output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS FC standard cable GP 2-core bus cable, shielded, special design for fast installation, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1830-0EH10**
PROFIBUS FC robust bus cable with PUR protective jacket For use environments subject to harsh chemicals and mechanical stress, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS FC flexible cable GP 2-wire, shielded, special design for fast installation, delivery unit max. 1000 m, minimum order quantity 20 m, sold by the meter.	**6XV1831-2K**
PROFIBUS FC trailing cable	
PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3EH10**

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Selection and ordering data (continued)

PROFIBUS FC trailing cable Max. acceleration 4 m/s2, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, delivery unit, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1831-2L**
PROFIBUS FC food bus cable with PE protective jacket For use in the food, beverages and tobacco industries, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC underground cable Underground cable, 2-wire shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-3FH10**
PROFIBUS FC FRNC cable GP Bus cable flame-retardant and halogen-free bus cable with copolymer sheath, FRNC sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable.	**6GK1905-6AA00**
IE FC RJ45 plugs RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
SIMATIC S7-1500, spare part display For S7-1500 CPUs with 70 mm or 175 mm width	**6ES7591-1BA02-0AA0**
SIMATIC S7-1500 spare part, front cover For DP interface of the CPU 1518-4 PN/DP	**6ES7591-8AA00-0AA0**

Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7518-4UP00-0AB0 CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
General information	
Product type designation	CPU 1518TF-4 PN/DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V19 (FW V3.1) / V17 (FW V2.9) or higher
Display	
Screen diagonal [cm]	6.1 cm
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	9 Mbyte
• integrated (for data)	60 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7518-4UP00-0AB0 CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	512
- of which in line, max.	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes; Minimum send cycle of 250 µs
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8

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Technical specifications (continued)

Article number	6ES7518-4UP00-0AB0 CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X3
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	No
• PROFINET IO device	No
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call

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Technical specifications (continued)

Article number	6ES7518-4UP00-0AB0 CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	15 360
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	512
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	Yes; only with S7-1500T Motion Control KinPlus, as of TIA Portal V18 / FW V3.0
- user-defined kinematics	Yes
- SIMATIC Safe Kinematics	Yes; optional, SIMATIC Safe Kinematics V17 or higher
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Password for display	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes

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Technical specifications (continued)

Article number	6ES7518-4UP00-0AB0 CPU 1518TF-4 PN/DP, 9MB Prog, 60MB data
• User administration	Yes; device-wide
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	2 079 g

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Overview



- 16, 32 and 64-channel digital input modules
- Sinking and sourcing input versions available
- Module for recording NAMUR signals
- Optionally with internal 6 kHz, 10 kHz or 20 kHz counter
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

Selection and ordering data

SM 521 digital input modules Module width 35 mm	
SIMATIC S7-1500, digital input module DI 16x 24 V DC HF 16 channels in groups of 16; of which 2 inputs can be used as counters; input delay 0.05..20 ms; input type 3 (IEC 61131); diagnostics; hardware interrupts: order front connectors (screw terminals or push-in) separately	**6ES7521-1BH00-0AB0**
SIMATIC S7-1500, digital input module DI 32x 24 V DC HF 32 channels in groups of 16; of which 2 inputs can be used as counters; input delay 0.05..20 ms input type 3 (IEC 61131); diagnostics; hardware interrupts: order front connectors (screw terminals or push-in) separately	**6ES7521-1BL00-0AB0**
SIMATIC S7-1500, digital input module DI 16x24 V DC HS 16 channels in groups of 8; for 24 V encoders; 24 V DC sensor supply; input type 2 (IEC 61131); input delay parameterizable 0.05..20 ms; isochronous mode up to 250 µs; integr. counting function up to 20 kHz; pulse stretching; flutter monitoring; signal inversion diagnostics; hardware interrupts: order front connectors (screw terminals or push-in) and, if required, shielding set separately	**6ES7521-7BH00-0AB0**
SIMATIC S7-1500, digital input module, DI 64x 24 V DC SNK/SRC BA 64 channels in groups of 16, input delay typ. 3.2 ms, input type 3 (IEC 61131); sinking/sourcing input. 35 mm wide, cable and terminal blocks to be ordered separately as accessories	**6ES7521-1BP00-0AA0**
SIMATIC S7-1500, digital input module DI 16x 24 V DC BA, sourcing input 16 channels in groups of 16; input delay 3.2 ms; input type 3 (IEC 61131): order front connectors (screw terminals or push-in) separately	**6ES7521-1BH50-0AA0**
SIMATIC S7-1500, digital input module DI 16x 230 V AC BA 16 channels in groups of 4; input delay 20 ms; input type 1 (IEC 61131): order front connectors (screw terminals or push-in) separately	**6ES7521-1FH00-0AA0**
SIMATIC S7-1500, digital input module DI 16x 24...125 V UC HF 16 channels in groups of 1; input delay 0.05..20 ms; input type 3 (IEC 61131); diagnostics; hardware interrupts: order front connectors (screw terminals or push-in) separately	**6ES7521-7EH00-0AB0**
SIMATIC S7-1500, digital input module DI 16xNAMUR HF 16 channels in groups of 8; for 8.2 V NAMUR encoders; 8.2 V sensor supply; input delay; parameterizable 0.05 ... 20 ms; integr. counting function up to 20 kHz pulse stretching; flutter monitoring; signal inversion diagnostics; hardware interrupts; all components required for shielding are included in the scope of delivery; please order front connector (screw terminals or push-in) separately Module width 25 mm; front connector (push-in) included in scope of delivery	**6ES7521-7TH00-0AB0**
SIMATIC S7-1500, digital input module DI 16x 24 V DC BA 16 channels in groups of 16, input delay typ. 3.2 ms, input type 3 (IEC 61131); delivery incl. push-in front connector	**6ES7521-1BH10-0AA0**
SIMATIC S7-1500, digital input module DI 32x 24 V DC BA 32 channels in groups of 16, input delay typ. 3.2 ms, input type 3 (IEC 61131); delivery incl. push-in front connector	**6ES7521-1BL10-0AA0**
Accessories	
Front connector	

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Selection and ordering data (continued)

SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
SIMATIC S7-1500, spare part jumper links For front connectors for 35 mm wide IO modules; can be used for all 24 V DC modules; 20 units per packing unit; Note: not suitable for 230 V, not suitable for analog modules	**6ES7592-3AA00-0AA0**
DIN A4 labeling sheets	
SIMATIC S7-1500, labeling sheets for 35 mm Wide S7-1500 modules, color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, labeling sheets for 25 mm Wide S7-1500 modules and compact CPUs, color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 20 strips per packing unit sufficient for 200 modules	**6ES7592-1AX00-0AA0**
SIMATIC S7-1500, spare part, U-connector For connecting I/O modules; self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
SIMATIC S7-1500, spare part front door for 35 mm Wide IO modules; consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part front door for 25 mm Wide IO modules; consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7521-1BH00-0-AB0	6ES7521-1BL00-0A-B0	6ES7521-7BH00-0-AB0	6ES7521-1BH50-0-AA0	6ES7521-1FH00-0-AA0	6ES7521-1BP00-0-AA0
	S7-1500, DI 16x24VDC HF	S7-1500, DI 32x24VDC HF	S7-1500, DI 16X24VDC HS	S7-1500, DI 16x24VDC SRC BA	S7-1500, DI 16x230VAC BA	S7-1500, DI 64x24VDC SNK/SRC BA
General information						
Product type designation	DI 16x24VDC HF	DI 32x24VDC HF	DI 16x24 V DC HS	DI 16x24VDC SRC BA	DI 16x230VAC BA	DI 64x24VDC BA
Product function						
• Isochronous mode	Yes	Yes	Yes	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes	Yes	No
Engineering with						
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 / -	V13 SP1 / -	STEP 7 V17 or higher	V12 / V12	V12 / V12	V16 with HSP 0319 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.35 / -
Operating mode						
• DI	Yes	Yes	Yes	Yes	Yes	Yes
• Counter	Yes	Yes	Yes	No	No	No
• Oversampling	No	No	Yes	No		No
• MSI	Yes	Yes	Yes	Yes	Yes	Yes
Supply voltage						
Rated value (DC)	24 V	24 V	24 V	24 V		24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes	Yes
Encoder supply						
Number of outputs			16; 2x 24 V DC			
24 V encoder supply						
• 24 V			Yes			
• Short-circuit protection			Yes; Per group, electronic			
• Output current, max.			150 mA; per group			
• Output current per module, max.			300 mA			
Digital inputs						
Number of digital inputs	16	32	16	16	16	64
Digital inputs, parameterizable	Yes	Yes	Yes	No	No	No
Sourcing/sinking input	P-reading	P-reading	P-reading	Sourcing	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 1					Yes	
Input characteristic curve in accordance with IEC 61131, type 2			Yes			
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes		Yes		Yes
Pulse extension		No	Yes; 0.05 s, 0.1 s, 0.2 s, 0.5 s, 1 s, 2 s	No	No	No
Edge evaluation		Yes; Positive edge, negative edge	Yes; Positive edge, negative edge	No	No	No
Signal change flutter		No	Yes; 2 to 32 signal changes	No	No	No
Flutter observation window		No	Yes; 0.5 s, 1 s to 100 s in 1-s steps	No	No	No
Number of simultaneously controllable inputs						
• Number of simultaneously controllable inputs		32	16; see additional description in the manual	16	16	64; see additional description in the manual

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Technical specifications (continued)

Article number	6ES7521-1BH00-0-AB0	6ES7521-1BL00-0A-B0	6ES7521-7BH00-0-AB0	6ES7521-1BH50-0-AA0	6ES7521-1FH00-0-AA0	6ES7521-1BP00-0-AA0
	S7-1500, DI 16x24VDC HF	S7-1500, DI 32x24VDC HF	S7-1500, DI 16X24VDC HS	S7-1500, DI 16x24VDC SRC BA	S7-1500, DI 16x230VAC BA	S7-1500, DI 64x24VDC SNK/SRC BA
Digital input functions, parameterizable						
• Gate start/stop	Yes	Yes	Yes; software/hardware gate			
• Freely usable digital input	Yes	Yes	Yes	Yes	Yes	Yes
• Counter				No	No	No
• Digital input with oversampling		No	Yes	No	No	No
Input voltage						
• Rated value (DC)	24 V	24 V	24 V	24 V		24 V
• Rated value (AC)					230 V; 120/230 V AC, 50/60 Hz	
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V	-5 to +30V	0V AC to 40V AC	-5 ... +5 V (reference potential is COM)
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V	-11 to -30V	79V AC to 264V AC	-11 ... -30 V; +11 ... +30 V (reference potential is COM)
Input current						
• for signal "1", typ.	2.5 mA	2.5 mA	9 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC	2.7 mA
Input delay (for rated value of input voltage)						
- for standard inputs						
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	No
- for interrupt inputs						
- Parameterizable	Yes	Yes	Yes	No	No	No
- for technological functions						
- Parameterizable	Yes	Yes	Yes	No	No	No
Encoder						
Connectable encoders						
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	2 mA	1.5 mA	2 mA	1.5 mA
Isochronous mode						
Filtering and processing time (TCI), min.	80 µs; At 50 µs filter time	80 µs; At 50 µs filter time	60 µs; At 50 µs filter time			
Bus cycle time (TDP), min.	250 µs	250 µs	250 µs			
Interrupts/diagnostics/status information						
Diagnostics function	Yes	Yes	Yes	No	No	No
Alarms						
• Diagnostic alarm	Yes	Yes	Yes	No	No	No
• Hardware interrupt	Yes	Yes	Yes	No	No	No
Diagnoses						
• Monitoring the supply voltage	Yes	Yes	Yes	No	No	No
• Monitoring of encoder power supply			Yes; short-circuit			
• Wire break	Yes; to I < 350 µA	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No	No
• short-circuit	No	No	No	No	No	No
Potential separation						
Potential separation channels						

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Technical specifications (continued)

Article number	6ES7521-1BH00-0-AB0 S7-1500, DI 16x24VDC HF	6ES7521-1BL00-0A-B0 S7-1500, DI 32x24VDC HF	6ES7521-7BH00-0-AB0 S7-1500, DI 16X24VDC HS	6ES7521-1BH50-0-AA0 S7-1500, DI 16x24VDC SRC BA	6ES7521-1FH00-0-AA0 S7-1500, DI 16x230VAC BA	6ES7521-1BP00-0-AA0 S7-1500, DI 64x24VDC SNK/SRC BA
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates						
Suitable for safety functions	No	No	No	No	No	No
Security						
signed firmware update	No	No	No	No	No	No
safely removing data		No	No	No	No	No
data integrity	No	No	No	No	No	No
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-30 °C; From FS05	-30 °C; From FS05	-30 °C	-25 °C; From FS05	-30 °C; From FS05	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS05	-30 °C; From FS05	-30 °C	-25 °C; From FS05	-30 °C; From FS05	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	Restrictions for installation altitudes > 2 000 m, see manual	Restrictions for installation altitudes > 2 000 m, see manual
Dimensions						
Width	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm	129 mm
Weights						
Weight, approx.	240 g	260 g	240 g	230 g	300 g	250 g
Other						
Note:						Please order cable and connection modules separately

Article number	6ES7521-7EH00-0AB0 S7-1500, DI 16 x 24...125V UC HF	6ES7521-7TH00-0AB0 S7-1500, DI 16XNAMUR HF
General information		
Product type designation	DI 16x24 ... 125 V UC HF	DI 16xNAMUR HF
Product function		
• Isochronous mode	No	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 / -	STEP 7 V17 or higher
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DI	Yes	Yes
• Counter	No	Yes
• Oversampling	No	No
• MSI	Yes	Yes
Supply voltage		
Rated value (DC)		24 V
Reverse polarity protection		Yes
Encoder supply		
Number of outputs		16; 2x 8.2 V DC

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Technical specifications (continued)

Article number	6ES7521-7EH00-0AB0 S7-1500, DI 16 x 24...125V UC HF	6ES7521-7TH00-0AB0 S7-1500, DI 16XNAMUR HF
NAMUR encoder supply		
• 8.2 V		Yes
• Short-circuit protection		Yes; Per group, electronic
• Output current, max.		100 mA; per group
• Output current per module, max.		200 mA
Digital inputs		
Number of digital inputs	16	16; NAMUR
Digital inputs, parameterizable	Yes	Yes
Sourcing/sinking input	Yes	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes; At 24 V DC	
Pulse extension		Yes; 0.05 s, 0.1 s, 0.2 s, 0.5 s, 1 s, 2 s
Edge evaluation		Yes; rising edge, falling edge, edge change
Signal change flutter		Yes; 2 to 32 signal changes
Flutter observation window		Yes; 0.5 s, 1 s to 100 s in 1-s steps
Number of simultaneously controllable inputs		
• Number of simultaneously controllable inputs		16
Digital input functions, parameterizable		
• Gate start/stop		Yes; software/hardware gate
• Freely usable digital input		Yes
• Digital input with oversampling		No
Input voltage		
• Rated value (DC)	24 V; 48 V, 125 V	8.2 V
• Rated value (AC)	24 V; 48 V, 125 V (50 - 60 Hz)	
• for signal "0"	-5 ... +5 V	
• for signal "1"	+11 ... +146 V	
Input current		
• for signal "1", typ.	3 mA; At 24 V DC	10 mA
- for 10 k switched contact		
- for signal "0", min.		0.35 mA
- for signal "0", max.		1.2 mA
- for signal "1", min.		2.1 mA
- for signal "1", max.		10 mA
- for unswitched contact		
- for signal "0", max. (permissible quiescent current)		0.35 to 1.2 mA
- for signal "1", typ.		2.1 ... 10 mA
- for NAMUR encoders		
- for signal "0", min.		0.35 mA
- for signal "0", max.		1.2 mA
- for signal "1", min.		2.1 mA
- for signal "1", max.		10 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms parameterizable with DC, 20 ms fixed with AC	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms
- for interrupt inputs		
- Parameterizable	Yes	Yes
- for technological functions		
- parameterizable	No	Yes
- for NAMUR inputs		
- at "0" to "1", max.		20 ms
- at "1" to "0", max.		20 ms
Encoder		
Connectable encoders		
• NAMUR encoder/changeover contact according to EN 60947		Yes; no CO contact

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Technical specifications (continued)

Article number	6ES7521-7EH00-0AB0 S7-1500, DI 16 x 24...125V UC HF	6ES7521-7TH00-0AB0 S7-1500, DI 16XNAMUR HF
• Single contact / changeover contact unconnected		Yes; no CO contact
• Single contact / changeover contact connected with 10 kΩ		Yes; no CO contact
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.2 mA
Isochronous mode		
Filtering and processing time (TCI), min.		60 µs; At 50 µs filter time
Bus cycle time (TDP), min.		250 µs
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Hardware interrupt	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	No	Yes
• Monitoring of encoder power supply		Yes; short-circuit
• Wire break	Yes; To I < 550 µA	Yes; to I < 350 µA
• short-circuit	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Security		
signed firmware update	No	No
safely removing data		No
data integrity	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.		5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	240 g	240 g

Article number	6ES7521-1BH10-0AA0 S7-1500, DI 16x24VDC BA	6ES7521-1BL10-0AA0 S7-1500, DI 32x24VDC BA
General information		
Product type designation	DI 16 x 24 V DC BA	DI 32x24VDC BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -
Operating mode		

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Technical specifications (continued)

Article number	6ES7521-1BH10-0AA0 S7-1500, DI 16x24VDC BA	6ES7521-1BL10-0AA0 S7-1500, DI 32x24VDC BA
• DI	Yes	Yes
• Counter	No	No
• Oversampling	No	No
• MSI	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Digital inputs		
Number of digital inputs	16	32
Digital inputs, parameterizable	No	No
Sourcing/sinking input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Pulse extension	No	No
Edge evaluation	No	No
Signal change flutter	No	No
Flutter observation window	No	No
Number of simultaneously controllable inputs		
• Number of simultaneously controllable inputs	16	32
Digital input functions, parameterizable		
• Freely usable digital input	Yes	Yes
• Counter	No	No
• Digital input with oversampling	No	No
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.7 mA	2.7 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	No	No
- for interrupt inputs		
- Parameterizable	No	No
- for technological functions		
- parameterizable	No	No
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Alarms		
• Diagnostic alarm	No	No
• Hardware interrupt	No	No
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire break	No	No
• short-circuit	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Security		
signed firmware update	No	No

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Technical specifications (continued)

Article number	6ES7521-1BH10-0AA0 S7-1500, DI 16x24VDC BA	6ES7521-1BL10-0AA0 S7-1500, DI 32x24VDC BA
safely removing data	No	No
data integrity	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C; from FS04
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C; from FS04
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	230 g	260 g
Other		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

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Overview



- 8, 32, 16 and 64-channel digital output modules
- Sinking and sourcing output versions available
- For flexible adaptation of the controller to the respective task
- Optionally with PWM functionality
- Optionally with integrated switching operation counter for predictive maintenance of the connected actuator
- Relay modules with integrated switching operation counter for predictive maintenance of the integrated relays
- For subsequent expansion of the system with additional outputs
- High Feature modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

Selection and ordering data

SM 522 digital output modules Module width 35 mm	
SIMATIC S7-1500, digital output module DQ 8x24 V DC/2 A HF 8 channels in groups of 8; 8 A per group; diagnostics; substitute value: 2 channels can be used for pulse width modulation (PWM). the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 3 / PL d according to EN ISO 13849-1:2015. order front connectors (screw terminals or push-in) separately	**6ES7522-1BF00-0AB0**
SIMATIC S7-1500, digital output module DQ 8x 24 V DC/2 A HS 8 channels in groups of 4; 5 A per channel, 8 A per group; two channels can be parallel-switched per group (2 x 8 A), 8 channels with pulse width modulation (PWM; max. 12.5 kHz), front connector (screw terminal or push-in) to be ordered separately	**6ES7522-5BF00-0AB0**
SIMATIC S7-1500, digital output module, DQ 16x24 V DC/0.5 A HF 16 channels in groups of 8; 4 A per group; single-channel diagnostics; substitute value: switching cycle counter for connected actuators. the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 3 / PL d according to EN ISO 13849-1:2015. order front connectors (screw terminals or push-in) separately	**6ES7522-1BH01-0AB0**
SIMATIC S7-1500, digital output module DQ 32x24 V DC/0.5 A HF 32 channels in groups of 8; 4 A per group; single-channel diagnostics; substitute value, switching cycle counter for connected actuators. the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 3 / PL d according to EN ISO 13849-1:2015. order front connectors (screw terminals or push-in) separately	**6ES7522-1BL01-0AB0**
SIMATIC S7-1500, digital output module DQ 64x24 V DC/0.3 A BA 64 channels in groups of 16, 2 A per group at 60 °C, sourcing output, 35 mm wide, the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 3 / PL d according to EN ISO 13849-1:2015. Order cables and terminal blocks separately as accessories	**6ES7522-1BP00-0AA0**
SIMATIC S7-1500, digital output module DQ 64x24 V DC/0.3 A SNK BA 64 channels in groups of 16, 2 A per group at 60 °C, sinking output, 35 mm wide cable and terminal blocks to be ordered separately as accessories	**6ES7522-1BP50-0AA0**
SIMATIC S7-1500, digital output module DQ 8x230 V AC/5 A ST Relay; 8 channels in groups of 1; 5 A per group; diagnostics; substitute value: Switching cycle counter for integrated relays, the module supports the safety-related shutdown of load groups up to SIL1 according to EN IEC 62061:2021 and Category 2 / PL c according to EN ISO 13849-1:2015. order front connectors (screw terminals or push-in) separately	**6ES7522-5HF00-0AB0**
SIMATIC S7-1500, digital output module DQ 16x 230V AC/2A ST Relay 16 channels in groups of 2; 4 A per group; switching cycle counter for integrated relays, diagnostics; substitute value: the module supports the safety-related shutdown of load groups up to SIL1 according to EN IEC 62061:2021 and Category 2 / PL c according to EN ISO 13849-1:2015. order front connectors (screw terminals or push-in) separately	**6ES7522-5HH00-0AB0**
SIMATIC S7-1500, digital output module DQ 8x230 V AC/2 A ST TRIAC; 8 channels in groups of 1; 2 A per group; substitute value: order front connectors (screw terminals or push-in) separately	**6ES7522-5FF00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, digital output module DQ 16x230 V AC/1 A ST TRIAC; 16 channels in groups of 2; 2 A per group; substitute value: order front connectors (screw terminals or push-in) separately	**6ES7522-5FH00-0AB0**
SIMATIC S7-1500, digital output module DQ 16x24.. 48 V UC/125 V DC/0.5 A ST 16 channels in groups of 1; 0.5 A per group; substitute value: Observe derating; the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 3 / PL d according to EN ISO 13849-1:2015. order front connectors (screw terminals or push-in) separately Module width 25 mm; front connector (push-in) included in scope of delivery	**6ES7522-5EH00-0AB0**
16 outputs, 24 V DC, 0.5 A Basic, isolated	**6ES7 522-1BH10-0AA0**
32 outputs, 24 V DC, 0.5 A Basic, isolated	**6ES7 522-1BL10-0AA0**
Accessories	
Front connector	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
SIMATIC S7-1500, spare part jumper links for front connector For 35 mm wide IO modules; can be used for all 24 V DC modules; 20 units per packing unit, Note: not suitable for 230 V, not suitable for analog modules	**6ES7592-3AA00-0AA0**
DIN A4 labeling sheets	
SIMATIC S7-1500, labeling sheets For 35 mm width S7-1500 modules, color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, labeling sheets For 25 mm wide S7-1500 modules and compact CPUs, color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 20 strips per packing unit sufficient for 200 modules	**6ES7592-1AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
SIMATIC S7-1500, spare part front door For 35 mm wide I/O modules; consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part front door For 25 mm wide I/O modules; consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**

Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5BF00-0AB0 S7-1500, DQ 8x24VDC/5A HS	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/125-VDC/0.5A ST
General information					
Product type designation	DQ 16x24VDC/0.5A HF	DQ 32x24VDC/0.5A HF	DQ 8x24VDC/2A HF	DQ 8x24VDC/5A HS	DQ 16x24 ... 48 V UC/125 V DC/0.5 A ST
Product function					
• Isochronous mode	Yes	Yes	No	Yes	No
• Prioritized startup	Yes	Yes	Yes	Yes	Yes
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -	V18 with HSP 0434 / V20	V13 SP1 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	STEP 7 V5.7 or higher SP1 or higher	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	revision 3 / version 5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V 2.43 / -	V2.3 / -
Operating mode					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	Yes; with an application	Yes; Valve control	No
• PWM	No	No	Yes	Yes; max. 12.5 kHz	No
• Cam control (switching at comparison values)	No	No	No	No	No
• Oversampling	No	No	No	Yes	No
• MSO	Yes	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes	Yes	Yes	Yes	Yes; FW V1.1.0 or higher
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group	Yes; through internal protection with 10 A per group	Yes; through internal protection with 10 A per group	
Digital outputs					
Type of digital output	Transistor	Transistor	Transistor	Transistor	Transistor
Number of digital outputs	16	32	8	8	16
Current-sinking	No	No		No	Yes
Current-sourcing	Yes	Yes	Yes	Yes; Push-pull output	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes	Yes			
output type acc. to IEC 61131, type 2			Yes		
Short-circuit protection	Yes; Clocked electronically	Yes; Clocked electronically	Yes	Yes	No
Open-circuit detection				No	
Overload protection				Thermal overload protection	
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	-17 V	M (-1 V)	200 V (suppressor diode)
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
Digital output functions, parameterizable					
• Switching tripped by comparison values	No	No		No	No
• Freely usable digital output	No		Yes	Yes	No
• PWM output	No		Yes; FS02 and FW V2.1.0 or higher	Yes	No
- Number, max.			2	8	
• Digital output with oversampling	No	No		Yes	No
- Number, max.				8	

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Technical specifications (continued)

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5BF00-0AB0 S7-1500, DQ 8x24VDC/5A HS	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/125-VDC/0.5A ST
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	0.5 A	2 A	5 A	0.5 A
• with inductive load, max.				5 A	
• on lamp load, max.	5 W	5 W	10 W	10 W	40 W; At 125 V DC, 10 W at 48 V UC, 5 W at 24 V UC
Load resistance range					
• lower limit	48 Ω	48 Ω	12 Ω	4.8 Ω	
• upper limit	12 kΩ	12 kΩ	4 kΩ	4 kΩ	
Output voltage					
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.0 V)
Output current					
• for signal "1" rated value	0.5 A	0.5 A	2 A	5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.5 mA	
Output delay with resistive load					
• "0" to "1", typ.			80 µs	3 µs	
• "0" to "1", max.	100 µs	100 µs	100 µs		5 ms
• "1" to "0", typ.			300 µs	3 µs	
• "1" to "0", max.	500 µs	500 µs	500 µs		5 ms
Parallel switching of two outputs					
• for logic links	Yes	Yes	Yes	No	Yes
• for uprating	No	No	No	Yes; 8A for parallel connection of channel 0 and 1 / channel 4 and 5	No
• for redundant control of a load	Yes	Yes	Yes	No	Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz; With PWM operation: 500 Hz	12.5 kHz	25 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13; max. 500 Hz with PWM operation only with external circuit; see additional description in the manual	12.5 kHz; According to IEC 60947-5-1, DC-13	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	12.5 kHz	10 Hz
Total current of the outputs					
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual	2 A; see additional description in the manual	5 A; see additional description in the manual	0.5 A
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual	8 A; see additional description in the manual	8 A; see additional description in the manual	0.5 A
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual	16 A; see additional description in the manual	16 A; see additional description in the manual	8 A
Total current of the outputs (per module)					
- horizontal installation					
- up to 40 °C, max.				8 A	
- up to 60 °C, max.				5 A	
- vertical installation					
- up to 40 °C, max.				5 A	
Isochronous mode					
Execution and activation time (TCO), min.	70 µs	70 µs			
Bus cycle time (TDP), min.	250 µs	250 µs		250 µs	

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Technical specifications (continued)

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5BF00-0AB0 S7-1500, DQ 8x24VDC/5A HS	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/125-VDC/0.5A ST
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	No
• Maintenance interrupt	maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	No
• Wire break	Yes	Yes	No	No	No
• short-circuit	Yes	Yes	Yes	Yes	No
• Group error	Yes	Yes	Yes	Yes	No
Diagnostics indication LED					
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02	Yes; From FS03	No	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules					
• Performance level according to ISO 13849-1	PL d	PL d	PL d		PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3		Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2		SIL 2
Security					
signed firmware update	No	No	No	Yes	Yes
safely removing data	No	No		No	No
data integrity	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; From FS03	-30 °C; From FS03	-30 °C; From FS06	-30 °C	-25 °C; From FS05
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS03	-30 °C; From FS03	-30 °C; From FS06	-30 °C	-25 °C; From FS05
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m
Dimensions					
Width	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm

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Technical specifications (continued)

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5BF00-0AB0 S7-1500, DQ 8x24VDC/5A HS	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/125-VDC/0.5A ST
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
Weights					
Weight, approx.	230 g	280 g	240 g	236 g	230 g

Article number	6ES7522-5HF00-0AB0 S7-1500, DQ 8x230VAC/5A ST (Relay)	6ES7522-5HH00-0AB0 S7-1500, DQ 16x230VAC/2A ST (Relay)	6ES7522-5FF00-0AB0 S7-1500, DQ 8x230VAC/2A ST (Triac)	6ES7522-5FH00-0AB0 S7-1500, DQ 16x230VAC/1A ST (Triac)
General information				
Product type designation	DQ 8x230 V AC/5 A ST (relay)	DQ 16x 230 V AC/2 A ST (relay)	DQ 8x230 V AC/2A ST (triac)	DQ 16x230VAC/1A ST (Triac)
Product function				
• Isochronous mode	No	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	V12 / V12	V13 SP1 / -	V12 / V12	V13 SP1 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No
• PWM	No	No	No	No
• Cam control (switching at comparison values)	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes; FW V2.1.0 or higher	Yes; FW V1.1.0 or higher	Yes; FW V2.3.0 or higher	Yes; FW V1.3.0 or higher
Supply voltage				
Rated value (DC)	24 V	24 V		
Reverse polarity protection	Yes	Yes		
Digital outputs				
Type of digital output	Relays	Relays	Triac	Triac
Number of digital outputs	8	16	8	16
Current-sinking	Yes	Yes	No	Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	No	No	No	No
Controlling a digital input	Yes; possible	Yes		
Size of motor starters according to NEMA, max.	5	5	5	4
Digital output functions, parameterizable				
• Switching tripped by comparison values	No	No	No	No
• Freely usable digital output	No	No	No	No
• PWM output	No	No	No	No
• Digital output with oversampling	No	No	No	No
Switching capacity of the outputs				
• with resistive load, max.	5 A	2 A	2 A	1 A
• on lamp load, max.	1 500 W; 10 000 operating cycles	50 W (230 V AC), 5 W (24 V DC)	50 W	50 W
Output voltage				
• for signal "1", min.			L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current	L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current

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Technical specifications (continued)

Article number	6ES7522-5HF00-0AB0 S7-1500, DQ 8x230VAC/5A ST (Relay)	6ES7522-5HH00-0AB0 S7-1500, DQ 16x230VAC/2A ST (Relay)	6ES7522-5FF00-0AB0 S7-1500, DQ 8x230VAC/2A ST (Triac)	6ES7522-5FH00-0AB0 S7-1500, DQ 16x230VAC/1A ST (Triac)
Output current				
• for signal "1" rated value	5 A	2 A	2 A	1 A
• for signal "0" residual current, max.	0 A	0 A	2 mA	2 mA
Output delay with resistive load				
• "0" to "1", max.			1 AC cycle	1 AC cycle
• "1" to "0", max.			1 AC cycle	1 AC cycle
Parallel switching of two outputs				
• for logic links	Yes	Yes	No	No
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
Switching frequency				
• with resistive load, max.	2 Hz	1 Hz	10 Hz	10 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	2 Hz	1 Hz	1 Hz	1 Hz
Total current of the outputs				
• Current per channel, max.	8 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual	1 A; see additional description in the manual
• Current per group, max.	8 A; see additional description in the manual	4 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual
• Current per module, max.	64 A; see additional description in the manual	32 A; see additional description in the manual	10 A; see additional description in the manual	10 A; see additional description in the manual
Relay outputs				
• Number of relay outputs	8	16		
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V		
• Current consumption of relays (coil current of all relays), typ.	80 mA	150 mA		
• external protection for relay outputs	With miniature circuit breaker with characteristic B for: cos φ 1.0: 600 A cos φ 0.5 ... 0.7: 900 A with 8 A Diazed fuse: 1 000 A	Miniature circuit breaker B10 / B16		
• Contact connection (internal)	No	No		
• Number of operating cycles, max.	4 000 000; see additional description in the manual	see additional description in the manual		
• Relay approved acc. to UL 508	Yes; 250 V AC/5 A g.p.; 120 V AC TV-4 tungsten; A300, R300			
- Switching capacity of contacts				
- with inductive load, max.	see additional description in the manual	2 A; see additional description in the manual		
- with resistive load, max.	see additional description in the manual	2 A; see additional description in the manual		
Interrupts/diagnostics/status information				
Diagnostics function	Yes	No	No	No
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	No	No
• Maintenance interrupt	Yes; maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	No	No
• Wire break	No	No	No	No
• short-circuit	No	No	No	No
• Group error	No	No	No	No
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED

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Technical specifications (continued)

Article number	6ES7522-5HF00-0AB0 S7-1500, DQ 8x230VAC/5A ST (Relay)	6ES7522-5HH00-0AB0 S7-1500, DQ 16x230VAC/2A ST (Relay)	6ES7522-5FF00-0AB0 S7-1500, DQ 8x230VAC/2A ST (Triac)	6ES7522-5FH00-0AB0 S7-1500, DQ 16x230VAC/1A ST (Triac)
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	No	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS03	Yes; From FS02	No	No
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL c	PL c		
• Category according to ISO 13849-1	Cat. 2	Cat. 2		
• SIL acc. to IEC 62061	SIL 1	SIL 1		
Security				
signed firmware update	No	No	No	No
safely removing data	No	No	No	No
data integrity	No	No	No	No
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; From FS03	-25 °C; From FS02	-25 °C; From FS05	-25 °C; from FS04
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS03	-25 °C; From FS02	-25 °C; From FS05	-25 °C; from FS04
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	350 g	350 g	290 g	310 g

Article number	6ES7522-1BP00-0AA0 S7-1500, DQ 64x24VDC/0.3A BA	6ES7522-1BP50-0AA0 S7-1500, DQ 64x24VDC/0.3A SNK BA
General information		
Product type designation	DQ 64x24VDC/0.3A BA	DQ 64x24VDC/0.3A SNK BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V16 with HSP 0319 / V17	V16 with HSP 0319 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.35 / -	V2.35 / -
Operating mode		
• DQ	Yes	Yes
• DQ with energy-saving function	No	No

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Technical specifications (continued)

Article number	6ES7522-1BP00-0AA0 S7-1500, DQ 64x24VDC/0.3A BA	6ES7522-1BP50-0AA0 S7-1500, DQ 64x24VDC/0.3A SNK BA
• PWM	No	No
• Cam control (switching at comparison values)	No	No
• Oversampling	No	No
• MSO	Yes	Yes
• Integrated operating cycle counter	No	No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; Through internal protection with 4 A per group
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	64	64
Current-sinking	No	Yes
Current-sourcing	Yes	No
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	No; external fusing necessary, max. 4 A per group, tripping characteristic type B or C
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
Digital output functions, parameterizable		
• Switching tripped by comparison values	No	
• Freely usable digital output	No	
• PWM output	No	
• Digital output with oversampling	No	
Switching capacity of the outputs		
• with resistive load, max.	0.3 A	0.3 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	80 Ω	80 Ω
• upper limit	10 kΩ	10 kΩ
Output voltage		
• for signal "1", min.	L+ (-0.8 V)	M+ (0.5 V)
Output current		
• for signal "1" rated value	0.3 A	0.3 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Output delay with resistive load		
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", max.	500 µs	500 µs
Parallel switching of two outputs		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.3 A	0.3 A
• Current per group, max.	2 A	2 A
• Current per module, max.	8 A	8 A
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No

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Technical specifications (continued)

Article number	6ES7522-1BP00-0AA0 S7-1500, DQ 64x24VDC/0.3A BA	6ES7522-1BP50-0AA0 S7-1500, DQ 64x24VDC/0.3A SNK BA
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire break	No	No
• short-circuit	No	No
• Group error	No	No
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; via SIMATIC TOP connect connection module	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; via SIMATIC TOP connect connection module	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Suitable for safety-related tripping of standard modules	Yes; from FS01	No
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	
Security		
signed firmware update		No
safely removing data	No	
data integrity		No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	270 g	270 g
Other		
Note:	Please order cable and connection modules separately	Please order cable and connection modules separately

Article number	6ES7522-1BH10-0AA0 S7-1500, DQ 16x24VDC/0.5A BA	6ES7522-1BL10-0AA0 S7-1500, DQ 32x24VDC/0.5A BA
General information		
Product type designation	DQ 16x24VDC/0.5A BA	DQ 32x24VDC/0.5A BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	Yes
Engineering with		

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Technical specifications (continued)

Article number	6ES7522-1BH10-0AA0 S7-1500, DQ 16x24VDC/0.5A BA	6ES7522-1BL10-0AA0 S7-1500, DQ 32x24VDC/0.5A BA
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Cam control (switching at comparison values)	No	No
• Oversampling	No	No
• MSO	Yes	Yes
• Integrated operating cycle counter	No	No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sinking	No	No
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	No	No
output type acc. to IEC 61131, type 0.5	Yes	Yes
Short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
Digital output functions, parameterizable		
• Switching tripped by comparison values	No	No
• Freely usable digital output	No	No
• PWM output	No	No
• Digital output with oversampling	No	No
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Output delay with resistive load		
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", max.	500 µs	500 µs
Parallel switching of two outputs		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual

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Technical specifications (continued)

Article number	6ES7522-1BH10-0AA0 S7-1500, DQ 16x24VDC/0.5A BA	6ES7522-1BL10-0AA0 S7-1500, DQ 32x24VDC/0.5A BA
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire break	No	No
• short-circuit	No	No
• Group error	No	No
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Security		
signed firmware update	No	No
safely removing data	No	No
data integrity	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C; from FS04
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C; from FS04
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	230 g	280 g
Other		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

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Overview



- 16 digital inputs and 16 digital outputs (25 mm wide)
- 32 digital inputs, sinking/sourcing / 32 digital outputs, sourcing (35 mm wide)
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces: particularly economical, without parameters or diagnostic functions

Selection and ordering data

SM 523 digital input/output module Module width 35 mm	
SIMATIC S7-1500 digital input/output module, DI 32x24 V DC BA SNK / SRC 32 channels in groups of 16, input delay typ. 3.2 ms, input type 3 (IEC 61131), sinking/sourcing input, DQ 32x24 V DC/0.3 A SNK BA; 32 channels in groups of 16; 2 A per group at 60 °C; sinking output; 35 mm wide; order cables and terminal blocks separately as accessories Module width 25 mm; front connector (push-in) included in scope of delivery	**6ES7523-1BP50-0AA0**
SIMATIC S7-1500 digital input/output module, DI 16x 24 V DC 16 channels in groups of 16, input delay typ. 3.2 ms, input type 3 (IEC 61131), DQ 16x24 V DC/0.5 A BA; 16 channels in groups of 8; 4 A per group; the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 2 / PL c according to EN ISO 13849-1:2015. Supplied with push-in front connector	**6ES7523-1BL00-0AA0**
Accessories	
Front connector	
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets	
SIMATIC S7-1500, labeling sheets For 25 mm wide S7-1500 modules and compact CPUs, color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 20 strips per packing unit sufficient for 200 modules	**6ES7592-1AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
SIMATIC S7-1500, spare part front door For 25 mm wide I/O modules; consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7523-1BL00-0AA0 S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	6ES7523-1BP50-0AA0 S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
General information		
Product type designation	DI 16x24VDC / DQ16x24VDC/0.5A BA	DI 32 x 24 V DC / DQ 32 x 24 V DC/0.3A SNK BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13	V16 with HSP 0319 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.35 / -
Operating mode		
• DI	Yes	Yes
• Counter	No	No
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Cam control (switching at comparison values)	No	No
• Oversampling	No	No
• MSI	Yes	Yes
• MSO	Yes	Yes
• Integrated operating cycle counter	No	No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; Through internal protection with 4 A per group
Digital inputs		
Number of digital inputs	16	32
Digital inputs, parameterizable	No	No
Sourcing/sinking input	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Pulse extension	No	No
Edge evaluation	No	No
Signal change flutter	No	No
Flutter observation window	No	No
Number of simultaneously controllable inputs		
• Number of simultaneously controllable inputs	16; see additional description in the manual	32; see additional description in the manual
Digital input functions, parameterizable		
• Gate start/stop	No	No
• Freely usable digital input	No	No
• Counter	No	No
• Digital input with oversampling	No	No
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-5 ... +5 V (reference potential is COM)
• for signal "1"	+11 to +30V	-11 ... -30 V; +11 ... +30 V (reference potential is COM)
Input current		
• for signal "1", typ.	2.7 mA	2.7 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	No	No
- for interrupt inputs		
- Parameterizable	No	No
- for technological functions		

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Technical specifications (continued)

Article number	6ES7523-1BL00-0AA0 S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	6ES7523-1BP50-0AA0 S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
- parameterizable	No	No
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sinking	No	Yes
Current-sourcing	Yes	No
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	No; external fusing necessary, max. 4 A per group, tripping characteristic type B or C
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
Digital output functions, parameterizable		
• Switching tripped by comparison values	No	No
• Freely usable digital output	No	No
• PWM output	No	No
• Digital output with oversampling	No	No
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.3 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	80 Ω
• upper limit	12 kΩ	10 kΩ
Output voltage		
• for signal "1", min.	L+ (-0.8 V)	M+ (0.5 V)
Output current		
• for signal "1" rated value	0.5 A	0.3 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Output delay with resistive load		
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", max.	500 µs	500 µs
Parallel switching of two outputs		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A; see additional description in the manual	0.3 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual	2 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	4 A; see additional description in the manual
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
• Hardware interrupt	No	No
Diagnoses		

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Technical specifications (continued)

Article number	6ES7523-1BL00-0AA0 S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	6ES7523-1BP50-0AA0 S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
• Monitoring the supply voltage	No	No
• Wire break	No	No
• short-circuit	No	No
• Group error	No	No
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; From FS03	No
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	
Security		
signed firmware update	No	No
safely removing data	No	No
data integrity	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m
Dimensions		
Width	25 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	280 g	250 g
Other		
Note:	Supplied incl. 40-pole push-in front connectors	Please order cable and connection modules separately

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Overview



- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SM 521 digital input modules	
(Extended temperature range and exposure to environmental substances)	
16 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6AG1521-1BH00-7AB0**
32 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6AG1521-1BL00-7AB0**
16 inputs, 24 V DC, isolated, input delay 3.2 ms	**6AG1521-1BH50-7AA0**
16 inputs, 230 V AC, isolated, input delay 20 ms	**6AG1521-1FH00-7AA0**
16 inputs, 48 ... 125 V UC, input delay 0.05 ... 20 ms, parameterizable diagnostics and hardware interrupts	**6AG1521-7EH00-7AB0**
Accessories	
SIPLUS S7-1500 U connector	
Spare part for connecting I/O modules; self-assembling backplane bus; 5 pieces per packaging unit; with conformal coating, -40...+70 °C	**6AG1590-0AA00-7AA0**
Other accessories	See SIMATIC S7-1500, SM 521 digital input modules

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Technical specifications

Article number	6AG1521-1BH00-7AB0	6AG1521-1BL00-7AB0	6AG1521-1BH50-7AA0	6AG1521-1FH00-7AA0	6AG1521-7EH00-7AB0
	SIPLUS S7-1500 DI 16X24VDC HF	SIPLUS S7-1500 DI 32X24VDC HF	SIPLUS S7-1500 DI 16X24VDC SRC BA	SIPLUS S7-1500 DI 16X230VAC BA	SIPLUS S7-1500 DI 48VUC/125VDC HF
General information					
Product type designation	DI 16x24VDC HF	DI 32x24VDC HF	DI 16x24VDC SRC BA	DI 16x230VAC BA	DI 16x24 ... 125 V UC HF
Product function					
• Isochronous mode	Yes	Yes	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes	Yes
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	Yes	Yes	No	No	Yes; from V1.1.0; only in DC operation
• Oversampling	No	No			No
• MSI	Yes	Yes	Yes	Yes	Yes
Supply voltage					
Rated value (DC)	24 V	24 V			
Reverse polarity protection	Yes	Yes			
Digital inputs					
Number of digital inputs	16	32; > +60 °C, number of simultaneously controllable inputs max. 16	16; > +60 °C, number of simultaneously controllable inputs max. 8	16; > +60 °C, number of simultaneously controllable inputs max. 8	16; > +60 °C number of simultaneously controllable inputs max. 4 (no adjacent points)
Digital inputs, parameterizable		Yes		No	Yes
Sourcing/sinking input	P-reading	P-reading	Yes; Sourcing	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 1				Yes	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes		Yes; At 24 V DC
Digital input functions, parameterizable					
• Gate start/stop	Yes	Yes			
• Freely usable digital input	Yes	Yes			
• Counter					Yes; from FS04
Input voltage					
• Rated value (DC)	24 V	24 V	24 V		24 V; 48 V, 125 V
• Rated value (AC)				230 V; 120/230 V AC, 50/60 Hz	24 V; 48 V, 125 V (50 - 60 Hz)
• for signal "0"	-30 to +5 V	-30 to +5 V	-5 to +30V	0V AC to 40V AC	-5 ... +5 V
• for signal "1"	+11 to +30V	+11 to +30V	-11 to -30V	79V AC to 264V AC	+11 ... +146 V
Input current					
• for signal "1", typ.	2.5 mA	2.5 mA	4.5 mA	11 mA; At 230 V AC/50 Hz and 6.5 mA at 120 V AC/50 Hz	3 mA; At 24 V DC
Input delay (for rated value of input voltage)					
- for standard inputs					
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms parameterizable with DC, 20 ms fixed with AC
- for interrupt inputs					
- Parameterizable	Yes	Yes	No	No	Yes
- for technological functions					
- Parameterizable	Yes	Yes	No	No	No
Encoder					
Connectable encoders					

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Technical specifications (continued)

Article number	6AG1521-1BH00-7AB0	6AG1521-1BL00-7AB0	6AG1521-1BH50-7AA0	6AG1521-1FH00-7AA0	6AG1521-7EH00-7AB0
	SIPLUS S7-1500 DI 16X24VDC HF	SIPLUS S7-1500 DI 32X24VDC HF	SIPLUS S7-1500 DI 16X24VDC SRC BA	SIPLUS S7-1500 DI 16X230VAC BA	SIPLUS S7-1500 DI 48VUC/125VDC HF
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	2 mA	1.5 mA
Isochronous mode					
Filtering and processing time (TCI), min.	80 µs; At 50 µs filter time	80 µs; At 50 µs filter time			
Bus cycle time (TDP), min.	250 µs	250 µs			
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	No	No	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	No	No	Yes
• Hardware interrupt	Yes	Yes	No	No	Yes
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	No	No	No
• Wire break	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No	Yes; To I < 550 µA
• short-circuit	No	No	No	No	No
• Fuse blown		No			
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Security					
signed firmware update	No	No	No	No	Yes
data integrity	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 16	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. 4 inputs (no adjacent points)
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Resistance					
- Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems					

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Technical specifications (continued)

Article number	6AG1521-1BH00-7AB0	6AG1521-1BL00-7AB0	6AG1521-1BH50-7AA0	6AG1521-1FH00-7AA0	6AG1521-7EH00-7AB0
	SIPLUS S7-1500 DI 16X24VDC HF	SIPLUS S7-1500 DI 32X24VDC HF	SIPLUS S7-1500 DI 16X24VDC SRC BA	SIPLUS S7-1500 DI 16X230VAC BA	SIPLUS S7-1500 DI 48VUC/125VDC HF
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions					
Width	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
Weights					
Weight, approx.	240 g	260 g	230 g	200 g	240 g

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Overview



- 8, 16 and 32-channel digital output modules
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SM 522 digital output modules (Extended temperature range and exposure to environmental substances)	
8 outputs, 24 V DC; 2 A, isolated	**6AG1522-1BF00-7AB0**
16 outputs, 24 V DC; 0.5 A, isolated	**6AG1522-1BH01-7AB0**
32 outputs, 24 V DC; 0.5 A, isolated	**6AG1522-1BL01-7AB0**
8 relay outputs, 230 V AC, 5 A	**6AG1522-5HF00-2AB0**
16 relay outputs, 230 V AC, 2 A	**6AG1522-5HH00-7AB0**
8 outputs (triac), 230 V AC, 2 A	**6AG1522-5FF00-7AB0**
16 outputs (triac), 230 V AC, 1 A	**6AG1522-5FH00-7AB0**
16 outputs, 24 ... 48 V UC, 125 V DC, 0.5 A, isolated	**6AG1522-5EH00-7AB0**
Accessories	
SIPLUS S7-1500 U connector Spare part for connecting I/O modules; self-assembling backplane bus; 5 pieces per packaging unit; with conformal coating, -40...+70 °C	**6AG1590-0AA00-7AA0**
Other accessories	See SIMATIC S7-1500, SM 522 digital output modules

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Technical specifications

Article number	6AG1522-1BF00-7AB0 SIPLUS S7-1500 DQ 8X24VDC/2A HF	6AG1522-1BH01-7AB0 SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	6AG1522-1BL01-7AB0 SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	6AG1522-5EH00-7AB0 SIPLUS S7-1500 DQ 16x48VUC/125VDC ST
General information				
Product type designation	DQ 8x24VDC/2A HF	DQ 16x24VDC/0.5A HF	DQ 32x24VDC/0.5A HF	DQ 16x24 ... 48 V UC/125 V DC/0.5 A ST
Product function				
• Isochronous mode	No	Yes	Yes	No
• Prioritized startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	Yes; with an application	No	No	No
• PWM	Yes	No	No	No
• Cam control (switching at comparison values)	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes	Yes	Yes	Yes; FW V1.1.0 or higher
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	
Reverse polarity protection	Yes; through internal protection with 10 A per group	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group	
Digital outputs				
Type of digital output	Transistor	Transistor	Transistor	Transistor
Number of digital outputs	8; > +60 °C Number of simultaneously controllable outputs max. 8x 0.5 A, max. total current per group 2 A	16	32	16
Current-sinking				Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
output type acc. to IEC 61131, type 0.5		Yes	Yes	
output type acc. to IEC 61131, type 2	Yes			
Short-circuit protection	Yes	Yes; Clocked electronically	Yes; Clocked electronically	
Limitation of inductive shutdown voltage to	-17 V	L+ (-53 V)	L+ (-53 V)	200 V (suppressor diode)
Controlling a digital input	Yes	Yes	Yes	Yes
Digital output functions, parameterizable				
• Freely usable digital output	Yes			
• PWM output	Yes; FS02 and FW V2.1.0 or higher			
- Number, max.	2			
Switching capacity of the outputs				
• with resistive load, max.		0.5 A	0.5 A	0.5 A
• on lamp load, max.	10 W	5 W	5 W	40 W; At 125 V DC, 10 W at 48 V UC, 5 W at 24 V UC
Load resistance range				
• lower limit	12 Ω	48 Ω	48 Ω	
• upper limit	4 kΩ	12 kΩ	12 kΩ	
Output voltage				
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.0 V)
Output current				
• for signal "1" rated value	2 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	
Output delay with resistive load				
• "0" to "1", typ.	80 µs			

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Technical specifications (continued)

Article number	6AG1522-1BF00-7AB0 SIPLUS S7-1500 DQ 8X24VDC/2A HF	6AG1522-1BH01-7AB0 SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	6AG1522-1BL01-7AB0 SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	6AG1522-5EH00-7AB0 SIPLUS S7-1500 DQ 16x48VUC/125VDC ST
• "0" to "1", max.	100 µs	100 µs	100 µs	5 ms
• "1" to "0", typ.	300 µs			
• "1" to "0", max.	500 µs	500 µs	500 µs	5 ms
Parallel switching of two outputs				
• for logic links	Yes	Yes	Yes	Yes
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
Switching frequency				
• with resistive load, max.	100 Hz; With PWM operation: 500 Hz	100 Hz	100 Hz	25 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13; max. 500 Hz with PWM operation only with external circuit; see additional description in the manual	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz
Total current of the outputs				
• Current per channel, max.	2 A; see additional description in the manual	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual	0.5 A
• Current per group, max.	8 A; see additional description in the manual	4 A; see additional description in the manual	4 A; see additional description in the manual	0.5 A
• Current per module, max.	16 A; see additional description in the manual	8 A; see additional description in the manual	16 A; see additional description in the manual	8 A
Isochronous mode				
Execution and activation time (TCO), min.		70 µs	70 µs	
Bus cycle time (TDP), min.		250 µs	250 µs	
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	No
• Maintenance interrupt	Yes	Yes		Yes
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	No
• Wire break	No	Yes	Yes	No
• short-circuit	Yes	Yes	Yes	No
• Group error	Yes	Yes	Yes	
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS03	Yes; From FS02	Yes; From FS02	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules				

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Technical specifications (continued)

Article number	6AG1522-1BF00-7AB0 SIPLUS S7-1500 DQ 8X24VDC/2A HF	6AG1522-1BH01-7AB0 SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	6AG1522-1BL01-7AB0 SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	6AG1522-5EH00-7AB0 SIPLUS S7-1500 DQ 16x48VUC/125VDC ST
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2	
• SILCL according to IEC 62061				SILCL 2
Security				
signed firmware update	No	No	No	Yes
data integrity	No	No	No	No
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C Number of simultaneously controllable outputs max. 8x 0.5 A, max. total current per group 2 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; > +60 °C max. 0.25 A per output
• vertical installation, min.	-40 °C; = Tmin			
• vertical installation, max.	40 °C; = Tmax			
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				

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Technical specifications (continued)

Article number	6AG1522-1BF00-7AB0 SIPLUS S7-1500 DQ 8X24VDC/2A HF	6AG1522-1BH01-7AB0 SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	6AG1522-1BL01-7AB0 SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	6AG1522-5EH00-7AB0 SIPLUS S7-1500 DQ 16x48VUC/125VDC ST
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	240 g	230 g	280 g	230 g

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Overview



- 4, 8 or 16-channel analog input modules
- Optionally with extremely short conversion times and/or oversampling
- For the connection of analog sensors without additional amplifiers
- Modules with integrated HART communication available
- Optionally with "Measuring range adjustment" and "Measured value scaling"
- For solving even more complex automation tasks
- Analog input module for cell voltage measurement on electrolyzers and fuel cells

Selection and ordering data

SM 531 analog input modules	
SIMATIC S7-1500, analog input module AI 4xU/I/RTD/TC ST 16-bit resolution, accuracy 0.3%, 4 channels in groups of 4, 2 channels for RTD measurement, common mode voltage 10 V; diagnostics; hardware interrupts; supplied with push-in front connector, infeed element, shielding bracket, and shield terminal	**6ES7531-7QD00-0AB0**
SIMATIC S7-1500, analog input module, AI 8xU/I/R/RTD BA 16-bit resolution, accuracy 0.5%, 8 channels in groups of 8, 4 V DC common mode voltage, diagnostics, hardware interrupts; delivery including infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7531-7QF00-0AB0**
SIMATIC S7-1500, analog input module AI 8xU/I HS 16-bit resolution, accuracy 0.3%, 8 channels in groups of 8, common mode voltage 10 V; diagnostics; hardware interrupts 8 channels in 0.0625 ms oversampling; delivery including infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7531-7NF10-0AB0**
SIMATIC S7-1500, analog input module AI 8xU/I/RTD/TC ST 16-bit resolution, accuracy 0.3%, 8 channels in groups of 8, 4 channels for RTD measurement, common mode voltage 10 V; diagnostics; hardware interrupts; supplied with infeed element, shielding bracket and shield terminal order front connectors (screw terminals or push-in) separately	**6ES7531-7KF00-0AB0**
SIMATIC S7-1500, analog input module AI 8xU/I HF Up to 24-bit resolution, accuracy 0.1%, 8 channels in groups of 1, common mode voltage: 30 V AC/60 V DC, diagnostics; hardware interrupts measured values scalable, measuring range adaptation, calibration in RUN mode; delivery including infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7531-7NF00-0AB0**
SIMATIC S7-1500, analog input module AI 8xU/R/RTD/TC HF 16-bit resolution, up to 21-bit resolution for RTD and TC, accuracy 0.1%, 8 channels in groups of 1, common mode voltage: 30 V AC/60 V DC, diagnostics; hardware interrupts scalable temperature measuring range, type C thermocouple, calibration in RUN mode; delivery including infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7531-7PF00-0AB0**
SIMATIC S7-1500, analog input module, AI 16xU BA 16-bit resolution, accuracy 0.5%, 16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts; delivery including infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7531-7LH00-0AB0**
SIMATIC S7-1500, analog input module, AI 16xI BA 16-bit resolution, accuracy 0.5%, 16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts; delivery including infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7531-7MH00-0AB0**
SIMATIC S7-1500, analog input module AI 8xHART HF Accuracy 0.1%, 8 channels in groups of 4, common mode voltage: 30 V AC/60 V DC, diagnostics; hardware interrupts for calibration in RUN mode; delivery including infeed element, shielding bracket and shield terminal	**6ES7531-7TF00-0AB0**

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Selection and ordering data (continued)

SIMATIC S7-1500, analog input module for cell voltage measurement AI 24xCVM HF Up to 24-bit resolution, accuracy: 0.1%, 24 channels in groups of 12, insulation voltage: 600 V DC, diagnostics; hardware interrupts for calibration in RUN mode; Delivery including infeed element, shielding bracket and shield terminal: Front connector (push-in) included Note: Module is not suitable for regular voltage measurement of +/- 5 V!	**6ES7531-7LK00-0AB0**
Accessories	
Front connector	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets	
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, labeling sheets for 25 mm wide S7-1500 modules and compact CPUs Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 20 strips per packing unit sufficient for 200 modules	**6ES7592-1AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
SIMATIC S7-1500, spare part front door for 35 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part front door for 25 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-0AA0**
Shielding set I/O	
SIMATIC S7-1500, spare part, shielding set Consisting of: * shield terminal, * shielding bracket, * 24 V DC infeed element with screw-type connection system, suitable for analog and technology modules of the S7-1500, suitable for all front connectors for 35 mm wide modules 5 units per packing unit	**6ES7590-5CA00-0AA0**
SIMATIC S7-1500, spare part, shielding set Consisting of: * 4x shield terminal, * 4x shielding bracket, * 4x 24 V DC infeed element with push-in technology, suitable for analog modules, technology modules and compact CPU of the S7-1500, suitable for all front connectors for 25 mm wide modules	**6ES7590-5CA10-0XA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element, 10 units per packing unit	**6ES7590-5BA00-0AA0**

Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7531-7QD00-0AB0	6ES7531-7QF00-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF10-0AB0	6ES7531-7NF00-0AB0
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/R/RTD BA	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
General information					
Product type designation	AI 4xU/I/RTD/TC ST	AI 8xU/I/R/RTD BA	AI 8xU/I/RTD/TC ST	AI 8xU/I HS	AI 8xU/I HF
Product function					
• Isochronous mode	No	No	No	Yes	No
• Prioritized startup	No	No	No	Yes	Yes
• Measuring range scalable	No	No	No	No	No
• Scalable measured values	No	No	No	No	Yes
• Adjustment of measuring range	No	No	No	No	Yes
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13.0.2	V15.1 / V16	V12 / V12	V14 / -	V14 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode					
• Oversampling	No	No	No	Yes	No
• MSI	Yes	Yes	Yes	Yes	Yes
Supply voltage					
Rated value (DC)	24 V		24 V	24 V	24 V
Reverse polarity protection	Yes		Yes	Yes	Yes
Analog inputs					
Number of analog inputs	4	8	8	8	8
• For current measurement	4	8	8	8	8
• For voltage measurement	4	8	8	8	8
• For resistance/resistance thermometer measurement	2	8	4		
• For thermocouple measurement	4		8		
permissible input voltage for voltage input (destruction limit), max.	28.8 V	12 V; 12 V continuous, 30 V for max. 1 s	28.8 V	28.8 V	28.8 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA	40 mA
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA	230 ... 370 µA	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA		
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K		
Analog input with oversampling	No	No	No	Yes	No
Standardization of measured values	No	No	No	No	Yes; See manual for details
Input ranges (rated values), voltages					
• 0 to +5 V	No	No	No	No	No
• 0 to +10 V	No	No	No	No	No
• 1 V to 5 V	Yes	Yes	Yes	Yes	Yes
• -1 V to +1 V	Yes	Yes	Yes		
• -10 V to +10 V	Yes	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	No	Yes	No	Yes
• -25 mV to +25 mV	No	No	No	No	No
• -250 mV to +250 mV	Yes	No	Yes	No	No
• -5 V to +5 V	Yes	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	Yes	Yes	Yes	No	No

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Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0	6ES7531-7QF00-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF10-0AB0	6ES7531-7NF00-0AB0
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/R/RTD BA	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
• -500 mV to +500 mV	Yes	Yes	Yes	No	No
• -80 mV to +80 mV	Yes	No	Yes	No	No
Input ranges (rated values), currents					
• 0 to 20 mA	Yes	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes	Yes
Input ranges (rated values), thermocouples					
• type B	Yes	No	Yes	No	No
• type C	No	No	No	No	No
• Type E	Yes	No	Yes	No	No
• Type J	Yes	No	Yes	No	No
• Type K	Yes	No	Yes	No	No
• Type L	No	No	No	No	No
• Type N	Yes	No	Yes	No	No
• Type R	Yes	No	Yes	No	No
• Type S	Yes	No	Yes	No	No
• Type T	Yes	No	Yes	No	No
• Type U	No	No			
• Type TXK/TXK(L) to GOST	No	No	No	No	No
Input ranges (rated values), resistance thermometer					
• Cu 10	No	No	No	No	No
• Cu 10 according to GOST	No	No	No	No	No
• Cu 50	No	No	No	No	No
• Cu 50 according to GOST	No	No	No	No	No
• Cu 100	No	No	No	No	No
• Cu 100 according to GOST	No	No	No	No	No
• Ni 10	No	No	No	No	No
• Ni 10 according to GOST	No	No	No	No	No
• Ni 100	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 100 according to GOST	No	No	No	No	No
• Ni 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 1000 according to GOST	No	No	No	No	No
• LG-Ni 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 120	No	No	No	No	No
• Ni 120 according to GOST	No	No	No	No	No
• Ni 200	No	No		No	No
• Ni 200 according to GOST	No	No	No	No	No
• Ni 500	No	No	No	No	No
• Ni 500 according to GOST	No	No	No	No	No
• Pt 10	No	No	No	No	No
• Pt 10 according to GOST	No	No	No	No	No
• Pt 50	No	No	No	No	No
• Pt 50 according to GOST	No	No	No	No	No
• Pt 100	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 100 according to GOST	No	No	No	No	No
• Pt 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 1000 according to GOST	No	No	No	No	No
• Pt 200	Yes; Standard/climate	No	Yes; Standard/climate	No	No
• Pt 200 according to GOST	No	No	No	No	No
• Pt 500	Yes; Standard/climate	No	Yes; Standard/climate	No	No
• Pt 500 according to GOST	No	No	No	No	No

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Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4xU/I/RTD/TC ST	6ES7531-7QF00-0AB0 S7-1500, AI 8xU/I/R/RTD BA	6ES7531-7KF00-0AB0 S7-1500, AI 8xU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8xU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8xU/I HF
Input ranges (rated values), resistors					
• 0 to 150 ohms	Yes	No	Yes	No	No
• 0 to 300 ohms	Yes	No	Yes	No	No
• 0 to 600 ohms	Yes	Yes	Yes	No	No
• 0 to 3000 ohms	No	No	No	No	No
• 0 to 6000 ohms	Yes	Yes	Yes	No	No
• PTC	Yes	Yes	Yes	No	No
Thermocouple (TC)					
- Temperature compensation					
- Parameterizable	Yes		Yes		
Cable length					
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC	200 m; 50 m at 50 mV	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m	800 m
Analog value generation for the inputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	24 bit; When using the function "Scaling of the measured values" or "Measuring range adaptation" (32 bit REAL format); 16 bit when using the S7 format (16 bit INTEGER)
• Integration time, parameterizable	Yes	Yes	Yes		Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms		Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms	10 / 24 / 27 / 107 ms	9 / 23 / 27 / 107 ms		Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms	8 ms	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms		
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz		400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)				62.5 µs; independent of number of activated channels	Corresponds to the channel with the highest basic conversion time
Smoothing of measured values					
• Number of smoothing levels	4	4	4	4	4
• Parameterizable	Yes	Yes	Yes	Yes	Yes
Encoder					
Connection of signal encoders					
• for voltage measurement	Yes	Yes	Yes	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes; with external supply	Yes	Yes	Yes; with external transmitter supply
- Burden of 2-wire transmitter, max.	820 Ω		820 Ω	820 Ω	
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC	Yes; Only for PTC	Yes; Only for PTC	No	No

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Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4xU/I/RTD/TC ST	6ES7531-7QF00-0AB0 S7-1500, AI 8xU/I/R/RTD BA	6ES7531-7KF00-0AB0 S7-1500, AI 8xU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8xU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8xU/I HF
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	No	No
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC	No	Yes; All measuring ranges except PTC	No	No
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %	0.2 %	0.05 %
• Current, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %	0.2 %	0.05 %
• Resistance, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %		
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K	Ptxxx Standard: ±1.0 K, Ptxxx Climate: ±0.5 K, Nixxx Standard: ±0.5 K, Nixxx Climate: ±0.5 K	Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K		
• Thermocouple, relative to input range, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K		Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K		
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency					
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB	40 dB		80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	10 V	4 V	10 V	10 V	60 V DC/30 V AC
• Common mode interference, min.	60 dB	60 dB	60 dB	50 dB at 400 Hz; 60 dB at 60 / 50 / 10 Hz	80 dB
Isochronous mode					
Filtering and processing time (TCI), min.				80 µs	
Bus cycle time (TDP), min.				250 µs	
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses					
• Monitoring the supply voltage	Yes	No	Yes	Yes	Yes
• Wire break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; Only for 1 ... 5 V, 4 ... 20 mA, R, and RTD	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; only for 1 ... 5 V and 4 ... 20 mA	Yes; only for 1 ... 5 V and 4 ... 20 mA
• short-circuit	No	No	No	No	No
• Group error	No	No	No	No	No
• Overflow/Underflow	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No	No	No	No

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Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0 S7-1500, AI 4xU/I/RTD/TC ST	6ES7531-7QF00-0AB0 S7-1500, AI 8xU/I/R/RTD BA	6ES7531-7KF00-0AB0 S7-1500, AI 8xU/I/RTD/TC ST	6ES7531-7NF10-0AB0 S7-1500, AI 8xU/I HS	6ES7531-7NF00-0AB0 S7-1500, AI 8xU/I HF
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	No	Yes; green LED	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for applications according to AMS 2750	No	No	Yes; Declaration of Conformity, see online support entry 109757262	No	No
Suitable for applications according to CQI-9	No	No	Yes; Based on AMS 2750 E	No	No
Security					
signed firmware update	No	No	No	No	No
safely removing data	No	No	No	No	No
data integrity	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-25 °C; From FS03	-30 °C; From FS05	-25 °C; From FS08	-25 °C; From FS02	-30 °C; From FS02
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-25 °C; From FS03	-30 °C; From FS05	-25 °C; From FS08	-25 °C; From FS02	-30 °C; From FS02
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m
Dimensions					
Width	25 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
Weights					
Weight, approx.	210 g	250 g	310 g	300 g	280 g
Other					
Note:	Supplied incl. 40-pole push-in front connectors				

Article number	6ES7531-7LH00-0AB0 S7-1500, AI 16xU BA	6ES7531-7MH00-0AB0 S7-1500, AI 16xI BA
General information		
Product type designation	AI 16xU BA	AI 16xI BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	No	No
• Measuring range scalable	No	No
• Scalable measured values	No	No
• Adjustment of measuring range	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V16 with HSP 312 / V17	V16 with HSP 312 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -

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Technical specifications (continued)

Article number	6ES7531-7LH00-0AB0 S7-1500, AI 16xU BA	6ES7531-7MH00-0AB0 S7-1500, AI 16xI BA
Operating mode		
• Oversampling	No	No
• MSI	Yes	Yes
Analog inputs		
Number of analog inputs	16	16
• For current measurement		16
• For voltage measurement	16	
permissible input voltage for voltage input (destruction limit), max.	12 V; 12 V continuous, 30 V for max. 1 s	
permissible input current for current input (destruction limit), max.		40 mA
Analog input with oversampling	No	No
Standardization of measured values	No	No
Input ranges (rated values), voltages		
• 0 to +5 V	No	
• 0 to +10 V	No	
• 1 V to 5 V	Yes	
• -1 V to +1 V	Yes	
• -10 V to +10 V	Yes	
• -2.5 V to +2.5 V	No	
• -25 mV to +25 mV	No	
• -250 mV to +250 mV	No	
• -5 V to +5 V	Yes	
• -50 mV to +50 mV	No	
• -500 mV to +500 mV	No	
• -80 mV to +80 mV	No	
Input ranges (rated values), currents		
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes
Cable length		
• shielded, max.	200 m	800 m
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)	10 / 24 / 27 / 107 ms	10 / 24 / 27 / 107 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz
Smoothing of measured values		
• Number of smoothing levels	4	4
• Parameterizable	Yes	Yes
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	No
• for current measurement as 2-wire transducer	No	Yes; with external supply
• for current measurement as 4-wire transducer	No	Yes
• for resistance measurement with two-wire connection	No	No
• for resistance measurement with three-wire connection	No	No
• for resistance measurement with four-wire connection	No	No
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.3 %	
• Current, relative to input range, (+/-)		0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		

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Technical specifications (continued)

Article number	6ES7531-7LH00-0AB0 S7-1500, AI 16xU BA	6ES7531-7MH00-0AB0 S7-1500, AI 16xI BA
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• Common mode voltage, max.	4 V	4 V
• Common mode interference, min.	60 dB	60 dB
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire break	Yes; Only for 1 ... 5 V	Yes; Only for 4 ... 20 mA
• short-circuit	No	No
• Group error	No	No
• Overflow/Underflow	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	No	No
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for applications according to AMS 2750	No	No
Suitable for applications according to CQI-9	No	No
Security		
signed firmware update	No	No
safely removing data	No	No
data integrity	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	250 g	250 g

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF	6ES7531-7TF00-0AB0 S7-1500, AI 8xHART HF
General information		
Product type designation	AI 8xU/R/RTD/TC HF	AI 8xHART HF
Product function		
• Isochronous mode	No	No

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Technical specifications (continued)

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF	6ES7531-7TF00-0AB0 S7-1500, AI 8xHART HF
• Prioritized startup	Yes	No
• Measuring range scalable	Yes	No
• Scalable measured values	No	No
• Adjustment of measuring range	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V14 / -	V17/V18 with HSP 383
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.42 / -
Operating mode		
• Oversampling	No	No
• MSI	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Analog inputs		
Number of analog inputs	8; Plus one additional RTD (reference) channel	8
• For current measurement		8
• For voltage measurement	8; Plus one additional RTD (reference) channel	
• For resistance/resistance thermometer measurement	8; Plus one additional RTD (reference) channel	
• For thermocouple measurement	8; Plus one additional RTD (reference) channel	
permissible input voltage for voltage input (destruction limit), max.	20 V	
permissible input current for current input (destruction limit), max.		40 mA
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Cu10, Cu50, Cu100, Ni10, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100, Pt200 climate: 1 mA; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt200 standard, Pt500, Pt1000, PTC: 0.25 mA	
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	
Analog input with oversampling	No	No
Standardization of measured values	Yes; See manual for details	No
Input ranges (rated values), voltages		
• 0 to +5 V	No	
• 0 to +10 V	No	
• 1 V to 5 V	No	
• -1 V to +1 V	Yes	
• -10 V to +10 V	No	
• -2.5 V to +2.5 V	No	
• -25 mV to +25 mV	Yes	
• -250 mV to +250 mV	Yes	
• -5 V to +5 V	No	
• -50 mV to +50 mV	Yes	
• -500 mV to +500 mV	Yes	
• -80 mV to +80 mV	Yes	
Input ranges (rated values), currents		
• 0 to 20 mA	No	Yes
• -20 mA to +20 mA	No	Yes
• 4 mA to 20 mA	No	Yes
Input ranges (rated values), thermocouples		
• type B	Yes	
• type C	Yes	
• Type E	Yes	
• Type J	Yes	

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Technical specifications (continued)

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF	6ES7531-7TF00-0AB0 S7-1500, AI 8xHART HF
• Type K	Yes	
• Type L	No	
• Type N	Yes	
• Type R	Yes	
• Type S	Yes	
• Type T	Yes	
• Type TXK/TXK(L) to GOST	Yes	
Input ranges (rated values), resistance thermometer		
• Cu 10	Yes; Standard/climate	
• Cu 10 according to GOST	Yes; Standard/climate	
• Cu 50	Yes; Standard/climate	
• Cu 50 according to GOST	Yes; Standard/climate	
• Cu 100	Yes; Standard/climate	
• Cu 100 according to GOST	Yes; Standard/climate	
• Ni 10	Yes; Standard/climate	
• Ni 10 according to GOST	Yes; Standard/climate	
• Ni 100	Yes; Standard/climate	
• Ni 100 according to GOST	Yes; Standard/climate	
• Ni 1000	Yes; Standard/climate	
• Ni 1000 according to GOST	Yes; Standard/climate	
• LG-Ni 1000	Yes; Standard/climate	
• Ni 120	Yes; Standard/climate	
• Ni 120 according to GOST	Yes; Standard/climate	
• Ni 200	Yes; Standard/climate	
• Ni 200 according to GOST	Yes; Standard/climate	
• Ni 500	Yes; Standard/climate	
• Ni 500 according to GOST	Yes; Standard/climate	
• Pt 10	Yes; Standard/climate	
• Pt 10 according to GOST	Yes; Standard/climate	
• Pt 50	Yes; Standard/climate	
• Pt 50 according to GOST	Yes; Standard/climate	
• Pt 100	Yes; Standard/climate	
• Pt 100 according to GOST	Yes; Standard/climate	
• Pt 1000	Yes; Standard/climate	
• Pt 1000 according to GOST	Yes; Standard/climate	
• Pt 200	Yes; Standard/climate	
• Pt 200 according to GOST	Yes; Standard/climate	
• Pt 500	Yes; Standard/climate	
• Pt 500 according to GOST	Yes; Standard/climate	
Input ranges (rated values), resistors		
• 0 to 150 ohms	Yes	
• 0 to 300 ohms	Yes	
• 0 to 600 ohms	Yes	
• 0 to 3000 ohms	No	
• 0 to 6000 ohms	Yes	
• PTC	Yes	
Thermocouple (TC)		
- Temperature compensation		
- Parameterizable	Yes	
Cable length		
• shielded, max.	800 m; at U; 200 m at R/RTD/TC	800 m
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		

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Technical specifications (continued)

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF	6ES7531-7TF00-0AB0 S7-1500, AI 8xHART HF
• Resolution with overrange (bit including sign), max.	21 bit; For measuring mode RTC and TC when using the function "Scalable temperature measuring range" (32 bit REAL format); 16 bit for measuring mode R and U; 16 bit for all measuring modes when using the S7 format (16 bit INTEGER)	16 bit
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms	Fast Mode: 7 / 22 / 25 / 106 ms; Standard Mode: 12 / 55 / 65 / 308 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	10 / 50 / 60 / 400 Hz
• Basic execution time of the module (all channels released)	Corresponds to the channel with the highest basic conversion time	channel 0 and 4, 1 and 5, etc. measure in pairs simultaneously. The slower channel of each pair determines the basic execution time of the channel pair. The basic execution time of the module is calculated by adding the basic conversion times of the channel pairs.
Smoothing of measured values		
• Number of smoothing levels	4	4
• Parameterizable	Yes	Yes
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	No
• for current measurement as 2-wire transducer	No	Yes
- Burden of 2-wire transmitter, max.		820 Ω; at 24 V input voltage
• for current measurement as 4-wire transducer	No	Yes
• for resistance measurement with two-wire connection	Yes	No
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	No
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC	No
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.05 %	
• Current, relative to input range, (+/-)		0.05 %; without HART communication
• Resistance, relative to input range, (+/-)	0.05 %	
• Resistance thermometer, relative to input range, (+/-)	Cuxxx Standard: ±0.3 K, Cuxxx Klima: ±0.2 K, Ptxxx Standard: ±0.5 K, Ptxxx Klima: ±0.2 K, Nixxx Standard: ±0.3 K, Nixxx Klima: ±0.15 K	
• Thermocouple, relative to input range, (+/-)	Type B: > 600 °C ±1 K, Type E: > -200 °C ±0.5 K, Type J: > -210 °C ±0.5 K, Type K: > -200 °C ±1 K, Type N: > -200 °C ±1 K, Type R: > 0 °C ±1 K, Type S: > 0 °C ±1 K, Type T: > -200 °C ±0.5 K, Type C: ±2 K, Type TXK/TXK(L): ±0.5 K	
Influence of a HART signal modulated on the input signal in relation to input range		
• error occurred at interference frequency suppression: 400 Hz		0.19 %; in the Standard operating mode, 0.55 % in the Fast operating mode
• error occurred at interference frequency suppression: 60 Hz		0.05 %; in the Standard operating mode, 0.1 % in the Fast operating mode
• error occurred at interference frequency suppression: 50 Hz		0.04 %; in the Standard operating mode, 0.09 % in the Fast operating mode
• error occurred at interference frequency suppression: 10 Hz		0.02 %; in the Standard operating mode, 0.03 % in the Fast operating mode
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	60 V DC/30 V AC	60 V DC/30 V AC
• Common mode interference, min.	80 dB	80 dB

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Technical specifications (continued)

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF	6ES7531-7TF00-0AB0 S7-1500, AI 8xHART HF
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes; Only with TC, R, RTD	Yes; With 4 mA to 20 mA, channel by channel
• short-circuit	No	No
• Group error	No	No
• Overflow/Underflow	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED
Potential separation		
Potential separation analog inputs		
• between the channels and backplane bus		Yes
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262	No
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E	No
Security		
signed firmware update	No	No
safely removing data	No	No
data integrity	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; From FS02	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS02	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	290 g	270 g

Article number	6ES7531-7LK00-0AB0 S7-1500, AI 24xCVM HF
General information	
Product type designation	AI 24xCVM HF
Product function	
• Isochronous mode	No

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Technical specifications (continued)

Article number	6ES7531-7LK00-0AB0 S7-1500, AI 24xCVM HF
• Measuring range scalable	No
• Scalable measured values	No
• Adjustment of measuring range	No
Engineering with	
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	not supported
Operating mode	
• Oversampling	No
• MSI	Yes
Analog inputs	
Number of analog inputs	24
• For voltage measurement	24; at ±3.5 V; 16 channels at ± 5 V
permissible input voltage for voltage input (destruction limit), max.	160 V
Analog input with oversampling	No
Standardization of measured values	No
Input ranges (rated values), voltages	
• -5 V to +5 V	Yes
Cable length	
• shielded, max.	200 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; 24 bits in floating-point format
• Integration time, parameterizable	Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)	10 / 24 / 28 / 109 ms
• Basic execution time of the module (all channels released)	Channel 0 and 12, 1 and 13, etc. measure in pairs simultaneously. The slower channel of each pair determines the basic execution time of the channel pair. The basic execution time of the module is calculated by adding the basic conversion times of the channel pairs.
Smoothing of measured values	
• Number of smoothing levels	4
• Parameterizable	Yes
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	No
• for current measurement as 4-wire transducer	No
• for resistance measurement with two-wire connection	No
• for resistance measurement with three-wire connection	No
• for resistance measurement with four-wire connection	No
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	36 dB
• Common mode interference, min.	70 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	No

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Technical specifications (continued)

Article number	6ES7531-7LK00-0AB0 S7-1500, AI 24xCVM HF
• Group error	No
• Overflow/Underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	No
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for applications according to AMS 2750	No
Suitable for applications according to CQI-9	No
Security	
signed firmware update	Yes
safely removing data	No
data integrity	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	4 000 m; Restrictions for installation altitudes > 2 000 m, see entry ID: 109763260
Dimensions	
Width	25 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	240 g
Other	
Note:	Supplied incl. 40-pole push-in front connectors

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Overview



- 2, 4 and 8-channel analog output modules
- Optionally with extremely short conversion times and/or oversampling
- For connecting analog actuators without additional amplifiers
- Modules with integrated HART communication available
- For solving even more complex automation tasks

Selection and ordering data

SM 532 analog output modules Module width 25 mm	
SIMATIC S7-1500, analog output module AQ 2x U/I ST 16-bit resolution, accuracy 0.3%. 2 channels in groups of 2, diagnostics; substitute value; the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 2 / PL c according to EN ISO 13849-1:2015. Supplied with push-in front connector, infeed element, shielding bracket and shield terminal Module width 35 mm	**6ES7532-5NB00-0AB0**
SIMATIC S7-1500, analog output module AQ 4xU/I ST 16-bit resolution, accuracy 0.3%. 4 channels in groups of 4, diagnostics; substitute value; the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 2 / PL c according to EN ISO 13849-1:2015. Supplied with infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7532-5HD00-0AB0**
SIMATIC S7-1500, analog output module AQ 8xU/I HS 16-bit resolution, accuracy 0.3%, 8 channels in groups of 8, diagnostics; substitute value 8 channels in 0.125 ms oversampling; the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 3 / PL d according to EN ISO 13849-1:2015. Supplied with infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7532-5HF00-0AB0**
SIMATIC S7-1500, analog output module AQ 4xU/I HF 16-bit resolution, accuracy 0.1%, 4 channels in groups of 1, common mode voltage: 30 V AC/60 V DC, diagnostics; substitute value, isochronous mode; the module supports the safety-related shutdown of load groups up to SIL2 according to EN IEC 62061:2021 and Category 3 / PL d according to EN ISO 13849-1:2015. Supplied with infeed element, shielding bracket and shield terminal: order front connectors (screw terminals or push-in) separately	**6ES7532-5ND00-0AB0**
SIMATIC S7-1500, analog output module AQ 8xHART HF 16-bit resolution, accuracy 0.2%, 8 channels in groups of 8, diagnostics, substitute values, delivery including infeed element, shielding bracket and shield terminal; Order front connectors (screw terminals or push-in) separately	**6ES7532-8TF00-0AB0**
Accessories	
Front connector	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets	

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Selection and ordering data (continued)

SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, labeling sheets for 25 mm wide S7-1500 modules and compact CPUs Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 20 strips per packing unit sufficient for 200 modules	**6ES7592-1AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
SIMATIC S7-1500, spare part front door for 35 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part front door for 25 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-0AA0**
Shielding set I/O	
SIMATIC S7-1500, spare part, shielding set Consisting of: * shield terminal, * shielding bracket, * 24 V DC infeed element with screw-type connection system, suitable for analog and technology modules of the S7-1500, suitable for all front connectors for 35 mm wide modules 5 units per packing unit	**6ES7590-5CA00-0AA0**
SIMATIC S7-1500, spare part, shielding set Consisting of: * 4x shield terminal, * 4x shielding bracket, * 4x 24 V DC infeed element with push-in technology, suitable for analog modules, technology modules and compact CPU of the S7-1500, suitable for all front connectors for 25 mm wide modules	**6ES7590-5CA10-0XA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element 10 units per packing unit	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7532-5NB00-0AB0	6ES7532-5HD00-0AB0	6ES7532-5HF00-0AB0	6ES7532-5ND00-0AB0	6ES7532-8TF00-0AB0
	S7-1500, AQ 2xU/I ST	S7-1500, AQ 4xU/I ST	S7-1500, AQ 8xU/I HS	S7-1500, AQ 4xU/I HF	S7-1500, AQ 8xHART HF
General information					
Product type designation	AQ 2xU/I ST	AQ 4xU/I ST	AQ 8xU/I HS	AQ 4xU/I HF	AQ 8xHART HF
Product function					
• Isochronous mode	No	No	Yes	Yes	No
• Prioritized startup	No	No	No	Yes	No
• Output range scalable	No	No	No	No	No
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13.0.2	V12 / V12	V14 / -	V14 / -	V18 and V19 with HSP0423
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V 2.43 / -
Operating mode					
• Oversampling	No	No	Yes	No	No
• MSO	Yes	Yes	Yes	Yes	Yes
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Analog outputs					
Number of analog outputs	2	4	8	4	8
Cycle time (all channels), min.	3.2 ms; independent of number of activated channels	3.2 ms; independent of number of activated channels	125 µs; independent of number of activated channels	125 µs; independent of number of activated channels	5 ms; independent of number of activated channels
Analog output with oversampling	No	No	Yes	No	No
Output ranges, voltage					
• 0 to 10 V	Yes	Yes	Yes	Yes	
• 1 V to 5 V	Yes	Yes	Yes	Yes	
• -5 V to +5 V	No	No	No	No	
• -10 V to +10 V	Yes	Yes	Yes	Yes	
Output ranges, current					
• 0 to 10 mA					No
• 0 to 20 mA	Yes	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes	No
• 4 mA to 20 mA	Yes	Yes	Yes	Yes	Yes
Load impedance (in rated range of output)					
• with voltage outputs, min.	1 kΩ; 0.5 kOhm at 1 to 5 V	1 kΩ; 0.5 kOhm at 1 to 5 V	1 kΩ	1 kΩ; 0.5 kOhm at 1 to 5 V	
• with voltage outputs, capacitive load, max.	1 µF	1 µF	100 nF	1 µF	
• with current outputs, max.	750 Ω	750 Ω	500 Ω	750 Ω	750 Ω
• with current outputs, inductive load, max.	10 mH	10 mH	1 mH	10 mH	10 mH
Cable length					
• shielded, max.	800 m; for current, 200 m for voltage	800 m; for current, 200 m for voltage	200 m	800 m; for current, 200 m for voltage	800 m
Analog value generation for the outputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
• Conversion time (per channel)	0.5 ms	0.5 ms	50 µs; independent of number of activated channels	125 µs; independent of number of activated channels	

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Technical specifications (continued)

Article number	6ES7532-5NB00-0AB0 S7-1500, AQ 2xU/I ST	6ES7532-5HD00-0AB0 S7-1500, AQ 4xU/I ST	6ES7532-5HF00-0AB0 S7-1500, AQ 8xU/I HS	6ES7532-5ND00-0AB0 S7-1500, AQ 4xU/I HF	6ES7532-8TF00-0AB0 S7-1500, AQ 8xHART HF
Settling time					
• for resistive load	1.5 ms	1.5 ms	30 µs; see additional description in the manual	0.2 ms; see additional description in the manual	3 ms; see additional description in the manual
• for capacitive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual	1.8 ms; see additional description in the manual	
• for inductive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual	2 ms; see additional description in the manual	3 ms; see additional description in the manual
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to output range, (+/-)	0.2 %	0.2 %	0.2 %	0.06 %	
• Current, relative to output range, (+/-)	0.2 %	0.2 %	0.2 %	0.1 %	0.1 %
Isochronous mode					
Execution and activation time (TCO), min.			100 µs	100 µs	
Bus cycle time (TDP), min.			250 µs	250 µs	
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire break	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes
• short-circuit	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes
• Overflow/Underflow	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS05	Yes; from FS04	Yes; From FS03	No
Highest safety class achievable for safety-related tripping of standard modules					
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d	
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3	
• SIL acc. to IEC 62061		SIL 2	SIL 2	SIL 2	
• SILCL according to IEC 62061	SIL 2				
Security					
signed firmware update	No	No	No	No	Yes

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Technical specifications (continued)

Article number	6ES7532-5NB00-0AB0	6ES7532-5HD00-0AB0	6ES7532-5HF00-0AB0	6ES7532-5ND00-0AB0	6ES7532-8TF00-0AB0
	S7-1500, AQ 2xU/I ST	S7-1500, AQ 4xU/I ST	S7-1500, AQ 8xU/I HS	S7-1500, AQ 4xU/I HF	S7-1500, AQ 8xHART HF
safely removing data	No	No	No	No	No
data integrity	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; from FS04	-30 °C; From FS06	-30 °C; From FS03	-25 °C; From FS02	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C; From FS06	-30 °C; From FS03	-25 °C; From FS02	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions					
Width	25 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
Weights					
Weight, approx.	200 g	310 g	325 g	300 g	300 g
Other					
Note:	Supplied incl. 40-pole push-in front connectors				

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Overview



- 4 analog inputs/ 2 analog outputs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces

Selection and ordering data

SM 534 analog input/output module Module width 25 mm	
SIMATIC S7-1500, analog input/output module AI 4x U/I/R/RTD/TC ST 4 channels in groups of 4; hardware interrupts; diagnostics AQ 2x U/I ST; 2 channels in groups of 2; substitute value; diagnostics common mode voltage approx. 10 V 16 bit; accuracy 0.3%; Supplied with push-in front connector, infeed element, shielding bracket and shield terminal	**6ES7534-7QE00-0AB0**
Accessories	
Front connector	
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets	
SIMATIC S7-1500, labeling sheets for 25 mm wide S7-1500 modules and compact CPUs Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 20 strips per packing unit sufficient for 200 modules	**6ES7592-1AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
SIMATIC S7-1500, spare part front door for 25 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-0AA0**
Shielding set I/O	
SIMATIC S7-1500, spare part, shielding set Consisting of: * 4x shield terminal, * 4x shielding bracket, * 4x 24 V DC infeed element with push-in technology, suitable for analog modules, technology modules and compact CPU of the S7-1500, suitable for all front connectors for 25 mm wide modules	**6ES7590-5CA10-0XA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element, 10 units per packing unit	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7534-7QE00-0AB0 S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
General information	
Product type designation	AI 4xU/I/RTD/TC /AQ 2xU/I ST
Product function	
• Isochronous mode	No
• Prioritized startup	No
• Measuring range scalable	No
• Scalable measured values	No
• Adjustment of measuring range	No
• Output range scalable	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13.0.2
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -
Operating mode	
• Oversampling	No
• MSI	Yes
• MSO	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	4
• For current measurement	4
• For voltage measurement	4
• For resistance/resistance thermometer measurement	2
• For thermocouple measurement	4
permissible input voltage for voltage input (destruction limit), max.	28.8 V
permissible input current for current input (destruction limit), max.	40 mA
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Analog input with oversampling	No
Standardization of measured values	No
Input ranges (rated values), voltages	
• 0 to +5 V	No
• 0 to +10 V	No
• 1 V to 5 V	Yes
• -1 V to +1 V	Yes
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -25 mV to +25 mV	No
• -250 mV to +250 mV	Yes
• -5 V to +5 V	Yes
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Input ranges (rated values), thermocouples	
• type B	Yes
• type C	No
• Type E	Yes

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Technical specifications (continued)

Article number	6ES7534-7QE00-0AB0 S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
• Type J	Yes
• Type K	Yes
• Type L	No
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type U	No
• Type TXK/TXK(L) to GOST	No
Input ranges (rated values), resistance thermometer	
• Cu 10	No
• Cu 10 according to GOST	No
• Cu 50	No
• Cu 50 according to GOST	No
• Cu 100	No
• Cu 100 according to GOST	No
• Ni 10	No
• Ni 10 according to GOST	No
• Ni 100	Yes; Standard/climate
• Ni 100 according to GOST	No
• Ni 1000	Yes; Standard/climate
• Ni 1000 according to GOST	No
• LG-Ni 1000	Yes; Standard/climate
• Ni 120	No
• Ni 120 according to GOST	No
• Ni 200	No
• Ni 200 according to GOST	No
• Ni 500	No
• Ni 500 according to GOST	No
• Pt 10	No
• Pt 10 according to GOST	No
• Pt 50	No
• Pt 50 according to GOST	No
• Pt 100	Yes; Standard/climate
• Pt 100 according to GOST	No
• Pt 1000	Yes; Standard/climate
• Pt 1000 according to GOST	No
• Pt 200	Yes; Standard/climate
• Pt 200 according to GOST	No
• Pt 500	Yes; Standard/climate
• Pt 500 according to GOST	No
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
• PTC	Yes
Thermocouple (TC)	
- Temperature compensation	
- Parameterizable	Yes
Cable length	
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC
Analog outputs	
Number of analog outputs	2

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Technical specifications (continued)

Article number	6ES7534-7QE00-0AB0 S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Cycle time (all channels), min.	3.2 ms; ±0.5 ms, regardless of the number of activated channels
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -5 V to +5 V	No
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ; 0.5 kOhm at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Cable length	
• shielded, max.	800 m; for current, 200 m for voltage
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10
Smoothing of measured values	
• Number of smoothing levels	4
• Parameterizable	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Conversion time (per channel)	0.5 ms
Settling time	
• for resistive load	1.5 ms
• for capacitive load	2.5 ms
• for inductive load	2.5 ms
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	820 Ω
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %

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Technical specifications (continued)

Article number	6ES7534-7QE00-0AB0 S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
• Current, relative to input range, (+/-)	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K
• Thermocouple, relative to input range, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K
• Voltage, relative to output range, (+/-)	0.2 %
• Current, relative to output range, (+/-)	0.2 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode voltage, max.	10 V
• Common mode interference, min.	60 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes; only for input type 1 ... 5 V, 4 ... 20 mA, TC, R, RTD and output type current
• short-circuit	Yes; Only for output type "voltage"
• Overflow/Underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
Potential separation	
Potential separation analog inputs	
• between the channels and backplane bus	Yes
Potential separation analog outputs	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	No
Security	
signed firmware update	No
safely removing data	No
data integrity	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; from FS04
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; from FS04
• vertical installation, max.	40 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	25 mm
Height	147 mm

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Technical specifications (continued)

Article number	6ES7534-7QE00-0AB0 S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Depth	129 mm
Weights	
Weight, approx.	250 g
Other	
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermoelement: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K

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Overview



- 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SM 531 analog input modules	
(Extended temperature range and exposure to environmental substances)	
8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6AG1531-7NF10-7AB0**
8 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/6000 ohms, 16 bits	**6AG1531-7KF00-7AB0**
8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; including infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6AG1531-7NF00-7AB0**
8 analog inputs, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, ±25 mV; thermocouples type B, E, J, K, N, R, S, T, TXK/TXK(L) according to GOST; resistance thermometers Cu 10, Cu 50, Cu 100, Ni 10, Ni 100, Ni 120, Ni 200, Ni 500, Ni 1000, LG-Ni 1000, Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000; resistors 0...150/300/600/6000 ohms, PTC; 16 bit; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6AG1531-7PF00-4AB0**
Analog input module, AI 16xU BA, 16-bit resolution, accuracy 0.5%, 16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts;	**6AG1531-7LH00-7AB0**
Analog input module, AI 16xI BA, 16-bit resolution, accuracy 0.5%, 16 channels in groups of 16, 4 V DC common mode voltage, diagnostics, hardware interrupts;	**6AG1531-7MH00-7AB0**
Accessories	
SIPLUS S7-1500 U connector	
Spare part for connecting I/O modules; self-assembling backplane bus; 5 pieces per packaging unit; with conformal coating, -40...+70 °C	**6AG1590-0AA00-7AA0**
Other accessories	See SIMATIC S7-1500, SM 531 analog input modules

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Technical specifications

Article number	6AG1531-7NF10-7-AB0	6AG1531-7KF00-7-AB0	6AG1531-7NF00-7-AB0	6AG1531-7PF00-4-AB0	6AG1531-7LH00-7-AB0	6AG1531-7MH00--7AB0
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	SIPLUS S7-1500 AI 8XU/I HF	SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	SIPLUS S7-1500 AI 16xU BA	SIPLUS S7-1500 AI 16xI BA
General information						
Product type designation	AI 8xU/I HS	AI 8xU/I/RTD/TC ST	AI 8xU/I HF	AI 8xU/R/RTD/TC HF	AI 16xU BA	AI 16xI BA
Product function						
• Isochronous mode	Yes	No	No	No	No	No
• Prioritized startup	Yes	No	Yes	Yes	No	No
• Measuring range scalable	No	No	No	Yes	No	No
• Scalable measured values	No	No	Yes	No	No	No
• Adjustment of measuring range	No	No	Yes	No	No	No
Engineering with						
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	
Operating mode						
• Oversampling	Yes	No	No	No	No	No
• MSI	Yes	Yes	Yes	Yes	Yes	Yes
Supply voltage						
Rated value (DC)	24 V	24 V	24 V	24 V		
Reverse polarity protection	Yes	Yes	Yes	Yes		
Analog inputs						
Number of analog inputs	8; > +60 °C max. 4x ±20 mA or 4x ±10 V permissible	8; > +60 °C max. 2x ±20 mA or 4x ±10 V or 4x RTD permissible	8	8; Plus one additional RTD (reference) channel	16	16
• For current measurement	8	8	8			16
• For voltage measurement	8	8	8	8; Plus one additional RTD (reference) channel	16	
• For resistance/resistance thermometer measurement		4		8; Plus one additional RTD (reference) channel		
• For thermocouple measurement		8		8; Plus one additional RTD (reference) channel		
permissible input voltage for voltage input (destruction limit), max.	28.8 V	28.8 V	28.8 V	20 V	12 V; 12 V continuous, 30 V for max. 1 s	
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA			40 mA
Constant measurement current for resistance-type transmitter, typ.		150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA				
Technical unit for temperature measurement adjustable		Yes; °C/°F/K		Yes; °C/°F/K		
Input ranges (rated values), voltages						
• 0 to +5 V	No	No	No	No	No	
• 0 to +10 V	No	No	No	No	No	
• 1 V to 5 V	Yes	Yes	Yes	No	Yes	
• -1 V to +1 V		Yes		Yes	Yes	
• -10 V to +10 V	Yes	Yes	Yes	No	Yes	
• -2.5 V to +2.5 V	No	Yes	Yes	No	No	
• -25 mV to +25 mV	No	No	No	Yes	No	
• -250 mV to +250 mV	No	Yes	No	Yes	No	

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Technical specifications (continued)

Article number	6AG1531-7NF10-7-AB0	6AG1531-7KF00-7-AB0	6AG1531-7NF00-7-AB0	6AG1531-7PF00-4-AB0	6AG1531-7LH00-7-AB0	6AG1531-7MH00--7AB0
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	SIPLUS S7-1500 AI 8XU/I HF	SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	SIPLUS S7-1500 AI 16xU BA	SIPLUS S7-1500 AI 16xI BA
• -5 V to +5 V	Yes	Yes	Yes	No	Yes	
• -50 mV to +50 mV	No	Yes	No	Yes	No	
• -500 mV to +500 mV	No	Yes	No	Yes	No	
• -80 mV to +80 mV	No	Yes	No	Yes	No	
Input ranges (rated values), currents						
• 0 to 20 mA	Yes	Yes	Yes	No		Yes
• -20 mA to +20 mA	Yes	Yes	Yes	No		Yes
• 4 mA to 20 mA	Yes	Yes	Yes	No		Yes
Input ranges (rated values), thermocouples						
• type B	No	Yes	No	Yes		
• type C	No	No	No	Yes		
• Type E	No	Yes	No	Yes		
• Type J	No	Yes	No	Yes		
• Type K	No	Yes	No	Yes		
• Type L	No	No	No	No		
• Type N	No	Yes	No	Yes		
• Type R	No	Yes	No	Yes		
• Type S	No	Yes	No	Yes		
• Type T	No	Yes	No	Yes		
• Type TXK/TXK(L) to GOST	No	No	No	Yes		
Input ranges (rated values), resistance thermometer						
• Cu 10	No	No	No	Yes; Standard/climate		
• Cu 10 according to GOST	No	No	No	Yes; Standard/climate		
• Cu 50	No	No	No	Yes; Standard/climate		
• Cu 50 according to GOST	No	No	No	Yes; Standard/climate		
• Cu 100	No	No	No	Yes; Standard/climate		
• Cu 100 according to GOST	No	No	No	Yes; Standard/climate		
• Ni 10	No	No	No	Yes; Standard/climate		
• Ni 10 according to GOST	No	No	No	Yes; Standard/climate		
• Ni 100	No	Yes; Standard/climate	No	Yes; Standard/climate		
• Ni 100 according to GOST	No	No	No	Yes; Standard/climate		
• Ni 1000	No	Yes; Standard/climate	No	Yes; Standard/climate		
• Ni 1000 according to GOST	No	No	No	Yes; Standard/climate		
• LG-Ni 1000	No	Yes; Standard/climate	No	Yes; Standard/climate		
• Ni 120	No	No	No	Yes; Standard/climate		
• Ni 120 according to GOST	No	No	No	Yes; Standard/climate		
• Ni 200	No		No	Yes; Standard/climate		
• Ni 200 according to GOST	No	No	No	Yes; Standard/climate		
• Ni 500	No	No	No	Yes; Standard/climate		

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Technical specifications (continued)

Article number	6AG1531-7NF10-7-AB0 SIPLUS S7-1500 AI 8XU/I HS	6AG1531-7KF00-7-AB0 SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	6AG1531-7NF00-7-AB0 SIPLUS S7-1500 AI 8XU/I HF	6AG1531-7PF00-4-AB0 SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	6AG1531-7LH00-7-AB0 SIPLUS S7-1500 AI 16xU BA	6AG1531-7MH00--7AB0 SIPLUS S7-1500 AI 16xI BA
• Ni 500 according to GOST	No	No	No	Yes; Standard/climate		
• Pt 10	No	No	No	Yes; Standard/climate		
• Pt 10 according to GOST	No	No	No	Yes; Standard/climate		
• Pt 50	No	No	No	Yes; Standard/climate		
• Pt 50 according to GOST	No	No	No	Yes; Standard/climate		
• Pt 100	No	Yes; Standard/climate	No	Yes; Standard/climate		
• Pt 100 according to GOST	No	No	No	Yes; Standard/climate		
• Pt 1000	No	Yes; Standard/climate	No	Yes; Standard/climate		
• Pt 1000 according to GOST	No	No	No	Yes; Standard/climate		
• Pt 200	No	Yes; Standard/climate	No	Yes; Standard/climate		
• Pt 200 according to GOST	No	No	No	Yes; Standard/climate		
• Pt 500	No	Yes; Standard/climate	No	Yes; Standard/climate		
• Pt 500 according to GOST	No	No	No	Yes; Standard/climate		
Input ranges (rated values), resistors						
• 0 to 150 ohms	No	Yes	No	Yes		
• 0 to 300 ohms	No	Yes	No	Yes		
• 0 to 600 ohms	No	Yes	No	Yes		
• 0 to 3000 ohms	No	No	No	No		
• 0 to 6000 ohms	No	Yes	No	Yes		
• PTC	No	Yes	No	Yes		
Thermocouple (TC)						
- Temperature compensation						
- Parameterizable		Yes		Yes		
Cable length						
• shielded, max.	800 m	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m	800 m; at U; 200 m at R/RTD/TC	200 m	800 m
Analog value generation for the inputs						
Integration and conversion time/resolution per channel						
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	24 bit; When using the function "Scaling of the measured values" or "Measuring range adaptation" (32 bit REAL format); 16 bit when using the S7 format (16 bit INTEGER)	21 bit; For measuring mode RTC and TC when using the function "Scalable temperature measuring range" (32 bit REAL format); 16 bit for measuring mode R and U; 16 bit for all measuring modes when using the S7 format (16 bit INTEGER)	16 bit	16 bit
• Integration time, parameterizable		Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1531-7NF10-7-AB0	6AG1531-7KF00-7-AB0	6AG1531-7NF00-7-AB0	6AG1531-7PF00-4-AB0	6AG1531-7LH00-7-AB0	6AG1531-7MH00--7AB0
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	SIPLUS S7-1500 AI 8XU/I HF	SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	SIPLUS S7-1500 AI 16xU BA	SIPLUS S7-1500 AI 16xI BA
• Integration time (ms)		2,5 / 16,67 / 20 / 100 ms	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)		9 / 23 / 27 / 107 ms	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms	10 / 24 / 27 / 107 ms	10 / 24 / 27 / 107 ms
- additional conversion time for resistance measurement		150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms				
• Interference voltage suppression for interference frequency f1 in Hz		400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)	62.5 µs; independent of number of activated channels		Corresponds to the channel with the highest basic conversion time	Corresponds to the channel with the highest basic conversion time		
Smoothing of measured values						
• Parameterizable	Yes	Yes	Yes	Yes	Yes	Yes
Encoder						
Connection of signal encoders						
• for voltage measurement	Yes	Yes	Yes	Yes	Yes	No
• for current measurement as 2-wire transducer	Yes	Yes	Yes; with external transmitter supply	No		Yes; with external supply
- Burden of 2-wire transmitter, max.	820 Ω	820 Ω				
• for current measurement as 4-wire transducer	Yes	Yes	Yes	No		Yes
• for resistance measurement with two-wire connection	No	Yes; Only for PTC	No	Yes		No
• for resistance measurement with three-wire connection	No	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	No	Yes; All measuring ranges except PTC; internal compensation of the cable resistances		No
• for resistance measurement with four-wire connection	No	Yes; All measuring ranges except PTC	No	Yes; All measuring ranges except PTC		No
Errors/accuracies						
Basic error limit (operational limit at 25 °C)						
• Voltage, relative to input range, (+/-)	0.2 %	0.1 %	0.05 %	0.05 %	0.3 %	
• Current, relative to input range, (+/-)	0.2 %	0.1 %	0.05 %			0.3 %
• Resistance, relative to input range, (+/-)		0.1 %		0.05 %		
• Resistance thermometer, relative to input range, (+/-)		Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K		Cuxxx Standard: ±0.3 K, Cuxxx Klima: ±0.2 K, Ptxxx Standard: ±0.5 K, Ptxxx Klima: ±0.2 K, Nixxx Standard: ±0.3 K, Nixxx Klima: ±0.15 K		

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Technical specifications (continued)

Article number	6AG1531-7NF10-7-AB0 SIPLUS S7-1500 AI 8XU/I HS	6AG1531-7KF00-7-AB0 SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	6AG1531-7NF00-7-AB0 SIPLUS S7-1500 AI 8XU/I HF	6AG1531-7PF00-4-AB0 SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	6AG1531-7LH00-7-AB0 SIPLUS S7-1500 AI 16xU BA	6AG1531-7MH00--7AB0 SIPLUS S7-1500 AI 16xI BA
• Thermocouple, relative to input range, (+/-)		Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K		Type B: > 600 °C ±1 K, Type E: > -200 °C ±0.5 K, Type J: > -210 °C ±0.5 K, Type K: > -200 °C ±1 K, Type N: > -200 °C ±1 K, Type R: > 0 °C ±1 K, Type S: > 0 °C ±1 K, Type T: > -200 °C ±0.5 K, Type C: ±2 K, Type TXK/TXK(L): ±0.5 K		
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency						
• Series mode interference (peak value of interference < rated value of input range), min.		40 dB	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode	40 dB	40 dB
• Common mode voltage, max.	10 V	10 V	60 V DC/30 V AC	60 V DC/30 V AC	4 V	4 V
• Common mode interference, min.	50 dB at 400 Hz; 60 dB at 60 / 50 / 10 Hz	60 dB	80 dB	80 dB	60 dB	60 dB
Isochronous mode						
Filtering and processing time (TCI), min.	80 µs					
Bus cycle time (TDP), min.	250 µs					
Interrupts/diagnostics/status information						
Diagnostics function	Yes	Yes	Yes	Yes	Yes	Yes
Alarms						
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses						
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	No	No
• Wire break	Yes; only for 1 ... 5 V and 4 ... 20 mA	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; only for 1 ... 5 V and 4 ... 20 mA	Yes; Only with TC, R, RTD	Yes; Only for 1 ... 5 V	Yes; Only for 4 ... 20 mA
• short-circuit					No	No
• Group error					No	No
• Overflow/Underflow	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED						
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED					No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	No	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation						
Potential separation channels						
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1531-7NF10-7-AB0	6AG1531-7KF00-7-AB0	6AG1531-7NF00-7-AB0	6AG1531-7PF00-4-AB0	6AG1531-7LH00-7-AB0	6AG1531-7MH00--7AB0
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	SIPLUS S7-1500 AI 8XU/I HF	SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	SIPLUS S7-1500 AI 16xU BA	SIPLUS S7-1500 AI 16xI BA
Standards, approvals, certificates						
Suitable for applications according to AMS 2750		Yes; Declaration of Conformity, see online support entry 109757262		Yes; Declaration of Conformity, see online support entry 109757262		
Suitable for applications according to CQI-9		Yes; Based on AMS 2750 E		Yes; Based on AMS 2750 E		
Security						
signed firmware update	No	No	No	No	No	No
data integrity	No	No	No	No	No	No
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-30 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-30 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity						
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance						
- Coolants and lubricants						
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems						
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!

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Technical specifications (continued)

Article number	6AG1531-7NF10-7-AB0 SIPLUS S7-1500 AI 8XU/I HS	6AG1531-7KF00-7-AB0 SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	6AG1531-7NF00-7-AB0 SIPLUS S7-1500 AI 8XU/I HF	6AG1531-7PF00-4-AB0 SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	6AG1531-7LH00-7-AB0 SIPLUS S7-1500 AI 16xU BA	6AG1531-7MH00--7AB0 SIPLUS S7-1500 AI 16xI BA
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
- Use on ships/at sea						
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology						
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark						
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating						
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions						
Width	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm	129 mm
Weights						
Weight, approx.	300 g	310 g	280 g	290 g	250 g	250 g

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Technical specifications (continued)

Article number	6AG1531-7NF10-7-AB0	6AG1531-7KF00-7-AB0	6AG1531-7NF00-7-AB0	6AG1531-7PF00-4-AB0	6AG1531-7LH00-7-AB0	6AG1531-7MH00--7AB0
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST	SIPLUS S7-1500 AI 8XU/I HF	SIPLUS S7-1500 AI 8XU/R/RTD/TC HF	SIPLUS S7-1500 AI 16xU BA	SIPLUS S7-1500 AI 16xI BA
Other						
Note:		Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 ohms ±0.02%; resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermocouple: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K		for the R/RDT three-wire measurement, the conductor compensation is made alternating with the measurement; this then requires two module cycles for a measured value		

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Overview



- 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS SM 532 analog output modules	
(Extended temperature range and exposure to environmental substances)	
4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit	**6AG1532-5HD00-7AB0**
8 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shielding bracket, shield terminal, labeling strips, U connector, printed front door	**6AG1532-5HF00-7AB0**
Accessories	
SIPLUS S7-1500 U connector	
Spare part for connecting I/O modules; self-assembling backplane bus; 5 pieces per packaging unit; with conformal coating, -40...+70 °C	**6AG1590-0AA00-7AA0**
Other accessories	See SIMATIC S7-1500, SM 532 analog output modules

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Technical specifications

Article number	6AG1532-5HD00-7AB0 SIPLUS S7-1500 AQ 4XU/I ST	6AG1532-5HF00-7AB0 SIPLUS S7-1500 AQ 8XU/I HS
General information		
Product type designation	AQ 4xU/I ST	AQ 8xU/I HS
Product function		
• Isochronous mode	No	Yes
• Prioritized startup	No	No
• Output range scalable	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Operating mode		
• Oversampling	No	Yes
• MSO	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection		Yes
Analog outputs		
Number of analog outputs	4; > +60 °C max. 4x ±10 V permissible	8; > +60 °C max. 4x ±10 V permissible
Cycle time (all channels), min.	3.2 ms; independent of number of activated channels	125 µs; independent of number of activated channels
Output ranges, voltage		
• 0 to 10 V	Yes	Yes
• 1 V to 5 V	Yes	Yes
• -5 V to +5 V	No	No
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
• -20 mA to +20 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 kΩ; 0.5 kOhm at 1 to 5 V	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF	100 nF
• with current outputs, max.	750 Ω	500 Ω
• with current outputs, inductive load, max.	10 mH	1 mH
Cable length		
• shielded, max.	800 m; for current, 200 m for voltage	200 m
Analog value generation for the outputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Conversion time (per channel)	0.5 ms	50 µs; independent of number of activated channels
Settling time		
• for resistive load	1.5 ms	30 µs; see additional description in the manual
• for capacitive load	2.5 ms	100 µs; see additional description in the manual
• for inductive load	2.5 ms	100 µs; see additional description in the manual
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output range, (+/-)	0.2 %	0.2 %
• Current, relative to output range, (+/-)	0.2 %	0.2 %
Isochronous mode		
Execution and activation time (TCO), min.		100 µs
Bus cycle time (TDP), min.		250 µs
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes

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Technical specifications (continued)

Article number	6AG1532-5HD00-7AB0 SIPLUS S7-1500 AQ 4XU/I ST	6AG1532-5HF00-7AB0 SIPLUS S7-1500 AQ 8XU/I HS
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes; Only for output type "current"	Yes; Only for output type "current"
• short-circuit	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"
• Overflow/Underflow	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; From FS05	Yes; from FS04
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Security		
signed firmware update	No	No
data integrity	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. 4x ±10 V permissible
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request

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Technical specifications (continued)

Article number	6AG1532-5HD00-7AB0 SIPLUS S7-1500 AQ 4XU/I ST	6AG1532-5HF00-7AB0 SIPLUS S7-1500 AQ 8XU/I HS
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	310 g	325 g

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Overview



- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

Selection and ordering data

SIMATIC S7-1500, TM count 2x24 V counter module 2 channels for 24 V incremental encoder, 3 DI, 2 DQ per channel	**6ES7550-1AA01-0AB0**
Accessories	
Front connector	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
SIMATIC S7-1500, spare part front door for 35 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part, shielding set Consisting of: * shield terminal, * shielding bracket, * 24 V DC infeed element with screw-type connection system, suitable for analog and technology modules of the S7-1500, suitable for all front connectors for 35 mm wide modules 5 units per packing unit	**6ES7590-5CA00-0AA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element, 10 units per packing unit	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7550-1AA01-0AB0 S7-1500, TM Count 2x24V
General information	
Product type designation	TM Count 2x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V16 with HSP 0332 / V17
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
• PROFINET from GSD version/GSD revision	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	1 A; total current of all encoders/channels
Digital inputs	
Number of digital inputs	6; 3 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
• Probe	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes

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Technical specifications (continued)

Article number	6ES7550-1AA01-0AB0 S7-1500, TM Count 2x24V
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Interface types	
• Sourcing/sinking input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED

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Technical specifications (continued)

Article number	6ES7550-1AA01-0AB0 S7-1500, TM Count 2x24V
• for channel diagnostics	Yes; red LED
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
• suitable for SIMOTION	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes

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Technical specifications (continued)

Article number	6ES7550-1AA01-0AB0 S7-1500, TM Count 2x24V
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	250 g

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Overview



- 2-channel counter and position detection module with RS422 interface
- Extensive parameterization options for optimum task-specific adaptation
- Reduces load on controller due to preprocessing on the module
- Position detection with incremental and SSI absolute encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS422 signals or 5V-TTL signals
- Fast Mode with reduced functionality for particularly short cycle times

Selection and ordering data

SIMATIC S7-1500, TM PosInput 2 counting and position detection module For RS422 incremental encoders or SSI absolute encoders, 2 channels, 2 DI, 2 DQ per channel	**6ES7551-1AB01-0AB0**
Accessories	
Front connector	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
SIMATIC S7-1500, spare part front door for 35 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part, shielding set Consisting of: * shield terminal, * shielding bracket, * 24 V DC infeed element with screw-type connection system, suitable for analog and technology modules of the S7-1500, suitable for all front connectors for 35 mm wide modules 5 units per packing unit	**6ES7590-5CA00-0AA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element, 10 units per packing unit	**6ES7590-5BA00-0AA0**
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Technical specifications

Article number	6ES7551-1AB01-0AB0 S7-1500, TM PosInput 2
General information	
Product type designation	TM PosInput 2
Number of channels	2
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V17
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
• PROFINET from GSD version/GSD revision	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4; One 5V and 24V encoder supply per channel
5 V encoder supply	
• 5 V	Yes; 5.2 V ±2 %
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
Digital inputs	
Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- Parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)

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Technical specifications (continued)

Article number	6ES7551-1AB01-0AB0 S7-1500, TM PosInput 2
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes

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Technical specifications (continued)

Article number	6ES7551-1AB01-0AB0 S7-1500, TM PosInput 2
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	

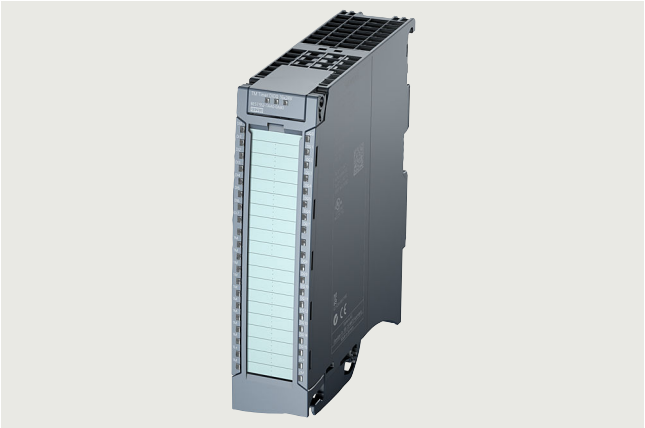
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Technical specifications (continued)

Article number	6ES7551-1AB01-0AB0 S7-1500, TM PosInput 2
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	325 g

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Overview



- 8 digital inputs, 16 digital outputs, can be used in different configurations as technological, time-controlled channels
- Inputs for detecting the input edges with µs accuracy
- Outputs for outputting switching signals with µs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

Selection and ordering data

SIMATIC S7-1500, TM timer DIDQ 24 x 24 V time-controlled digital inputs and outputs, max. 8 DI, 16 DQ; counting, PWM, oversampling	**6ES7552-1AA01-0AB0**
Accessories	
Front connectors	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
SIMATIC S7-1500, spare part front door for 35 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part, shielding set Consisting of: * shield terminal, * shielding bracket, * 24 V DC infeed element with screw-type connection system, suitable for analog and technology modules of the S7-1500, suitable for all front connectors for 35 mm wide modules 5 units per packing unit	**6ES7590-5CA00-0AA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element, 10 units per packing unit	**6ES7590-5BA00-0AA0**
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Technical specifications

Article number	6ES7552-1AA01-0AB0 S7-1500, TM Timer DIDQ 24x24V
General information	
Product type designation	TM Timer DIDQ 24x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 with HSP or higher
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	8; max. depending on parameterization
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	1.2 A; Total current of all encoders / channels, max. 0.5 A per output
Digital inputs	
Number of digital inputs	8; max. depending on parameterization
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Digital input with time stamp	Yes
• Counter	Yes
• Counter for incremental encoder	Yes
• Digital input with oversampling	Yes
• HW enable for digital input	Yes
• HW enable for digital output	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	16; max. depending on parameterization
• in groups of	8
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes

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Technical specifications (continued)

Article number	6ES7552-1AA01-0AB0 S7-1500, TM Timer DIDQ 24x24V
Digital output functions, parameterizable	
• Digital output with time stamp	Yes
• PWM output	Yes
- Number, max.	16
• Digital output with oversampling	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
Switching frequency	
• with resistive load, max.	10 kHz
Total current of the outputs	
• Current per group, max.	4 A
• Current per module, max.	8 A; Observe derating
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• pulse encoder	Yes
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• short-circuit	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED

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Technical specifications (continued)

Article number	6ES7552-1AA01-0AB0 S7-1500, TM Timer DIDQ 24x24V
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
Integrated Functions	
Counter	Yes
• Number of counters	4
• Counting frequency, max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
Position detection	
• Incremental acquisition	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Security	
signed firmware update	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	320 g

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Overview



- 4-channel interface module for PTO (Pulse Train Output)
- 3 signal interfaces can be configured for speed and direction:
  - 24 V asymmetrical up to 200 kHz
  - RS422, 5 V symmetrical up to 1 MHz
  - TTL 5 V asymmetrical up to 200 kHz
- 3 signal types can be configured:
  - Pulse and direction
  - Pulses for forward movement and pulses for backwards movement
  - 2 phase-shifted signals, with simple or quadruple evaluation
- Supported technology objects:
  - Speed axis (S7-1500, S7-1500T)
  - Positioning axis (S7-1200, S7-1500, S7-1500T)
  - Synchronous axis (S7-1500, S7-1500T)
  - Probe (S7-1500, S7-1500T)

Selection and ordering data

SIMATIC S7-1500, TM PTO 4 interface module For stepper drives 4 channels pulse train output PTO: 24 V, RS422, 5 V, 2 DI, 1 DQ 24 V DC per channel	**6ES7553-1AA01-0AB0**
Accessories	
Front connector	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
SIMATIC S7-1500, spare part front door for 35 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram, 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part, shielding set Consisting of: * shield terminal, * shielding bracket, * 24 V DC infeed element with screw-type connection system, suitable for analog and technology modules of the S7-1500, suitable for all front connectors for 35 mm wide modules 5 units per packing unit	**6ES7590-5CA00-0AA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element, 10 units per packing unit	**6ES7590-5BA00-0AA0**
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Technical specifications

Article number	6ES7553-1AA01-0AB0 S7-1500, TM PTO4
General information	
Product type designation	TM PTO 4
Number of channels	4; Axes
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 or higher
• STEP 7 configurable/integrated from version	V5.5 SP3 with GSD file / -
• PROFINET from GSD version/GSD revision	GSDML V2.43
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	12; 3 per channel, of which 1 DIQ
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Synchronization	Yes
• Probe	Yes
• Drive ready	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-5 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- parameterizable	Yes
Digital outputs	
Number of digital outputs	12; 3 per channel, of which 1 DIQ
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Controlling a digital input	Yes
Digital output functions, parameterizable	
• PTO (pulse train output) signal interface	
- 24 V asymmetrical	Yes
- RS 422 symmetrical	Yes
- TTL (5 V) asymmetrical	Yes
• PTO (pulse train output) signal type	
- Pulse and direction	Yes
- Count up, count down	Yes
- Incremental encoder (A, B phase shift)	Yes
- Incremental encoder (A, B phase shift, quadruple)	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.1 A; 0.5 A for DIQn.2

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Technical specifications (continued)

Article number	6ES7553-1AA01-0AB0 S7-1500, TM PTO4
Load resistance range	
• lower limit	240 Ω; 48 ohms for DIQn.2
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQn.2
Output current	
• for signal "1" rated value	0.1 A; 0.5 A for DIQn.2
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", typ.	1 µs; 28 µs for DIQn.2
• "1" to "0", typ.	1 µs; 25 µs for DIQn.2
Switching frequency	
• with resistive load, max.	1 kHz; For DIQn.2
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13, for DIQn.2
• For signal interface 24 V asymmetrical	200 kHz; With DQn.0 and DQn.1
• For signal interface RS 422 symmetrical	1 MHz
• For signal interface TTL (5 V) asymmetrical	200 kHz
Isochronous mode	
Bus cycle time (TDP), min.	250 µs; 375 µs if all 4 channels are used
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• short-circuit	Yes; Thermal overload protection
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Security	
signed firmware update	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-300	Yes; Via control and feedback interface
to SIMATIC S7-400	Yes; Via control and feedback interface
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes; Via control and feedback interface

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Technical specifications (continued)

Article number	6ES7553-1AA01-0AB0 S7-1500, TM PTO4
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g

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Overview



- User-programmable technology module with extremely short internal cycle time and very fast digital input and output signals
- The following are available:
  - 8 x digital input 24 V DC
  - 8 x digital output 24 V DC
  - 4 x digital input/output 24 V DC
  - 8 x RS485/RS422, usable as digital input or output with differential signal or as TTL asymmetrically
- Programming the application with the Quartus® Prime Design Software
- Cycle time of the application typ. 20 ns (nanoseconds); Thus a response time terminal – terminal from the application of a signal change at the input to a reaction at the output of significantly less than 1 µs can be achieved.

Selection and ordering data

SIMATIC S7-1500, TM FAST Field Adaptable High-Speed Technology Programmable with Quartus® Prime Design Software, 8xDI, 8xDQ, 4xDIQ 24 V, 8xRS485 DIQ, for extremely short response time of less than 1 µs	**6ES7554-1AA00-0AB0**
Accessories	
TM FAST Debug Connector For connecting a USB blaster to TM FAST, for commissioning and service purposes only	**6ES7554-1AA00-5AA0**
Front connector	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
SIMATIC S7-1500, spare part front door for 35 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part, shielding set Consisting of: * shield terminal, * shielding bracket, * 24 V DC infeed element with screw-type connection system, suitable for analog and technology modules of the S7-1500, suitable for all front connectors for 35 mm wide modules 5 units per packing unit	**6ES7590-5CA00-0AA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element 10 units per packing unit	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7554-1AA00-0AB0 S7-1500, TM FAST
General information	
Product type designation	TM FAST
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 with HSP or higher
• PROFINET from GSD version/GSD revision	GSDML V2.35
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	12; including 4 DIQs
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-5 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input frequency	
• For signal interface 24 V asymmetrical	200 kHz
• For signal interface RS 422 symmetrical	5 MHz
• For signal interface TTL (5 V) asymmetrical	1 MHz
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	application specific below 1µs possible
- for standard inputs	
- parameterizable	Yes; customer defined / 0.001 / 0.003 / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Number of digital outputs	12; including 4 DIQs
Short-circuit protection	Yes; electronic/thermal
Switching capacity of the outputs	
• with resistive load, max.	0.1 A; 0.3 A for DIQs
Load resistance range	
• lower limit	240 Ω; 80 ohms for DIQs
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQs
Output current	
• for signal "1" rated value	0.1 A; 0.3 A for DIQs
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", typ.	420 ns; for DQn
• "1" to "0", typ.	420 ns; for DQn
Switching frequency	
• with resistive load, max.	200 kHz; 1 kHz for DIQs

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Technical specifications (continued)

Article number	6ES7554-1AA00-0AB0 S7-1500, TM FAST
• For signal interface 24 V asymmetrical	200 kHz; 1 kHz for DIQs
• For signal interface RS 422 symmetrical	2 MHz
• For signal interface TTL (5 V) asymmetrical	200 kHz
Encoder	
Interface types	
• TTL 5 V	Yes; 8 channels (direction switchable)
• RS 422	Yes; 8 channels (direction switchable)
• Sourcing/sinking input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes; for RS485/RS422/TTL Input
• short-circuit	Yes; Thermal overload protection
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Security	
signed firmware update	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g

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Overview



Weighing electronics TM SIWAREX WP521 ST (left) and TM SIWAREX WP522 ST (right)

The TM SIWAREX WP521 ST and WP522 ST (ST = Standard) are versatile weighing modules for the SIMATIC S7-1500 Advanced Controller family. With these electronic weighing systems, simple weighing applications, such as platform or hopper scales, can be seamlessly integrated into the S7-1500 automation environment.

Selection and ordering data

	Article No.
Weighing electronics TM SIWAREX WP521 ST Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 x LC, 4 × DQ, 3 × DI, 1 × RS 485, Ethernet port, including shielding set.	**7MH4980-1AA01**
Weighing electronics TM SIWAREX WP522 ST Two-channel, for two separate platform scales or hopper scales with analog load cells (1 - 4 mV/V), per channel 1 × LC, 4 × DQ, 3 × DI, 1 × RS 485, Ethernet port, including shielding set.	**7MH4980-2AA01**
SIMATIC S7-1500, front connector with screw-type terminals 40-pin, for 35 mm wide modules, including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules, including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP52x ST to a PC (SIWATOOL V7 or Modbus TCP/IP)	**6XV1850-2GH20**
Accessories	
SIWAREX EB extension box For extending sensor cables	**7MH4710-2AA**
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	**7MH5001-0AA01**
SIWAREX IS Ex interface For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately.	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**
• Short-circuit current < 137 mA DC	**7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• Sheath color (for hazardous atmospheres): blue	**7MH4702-8AF**

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Selection and ordering data (continued)

	Article No.
Remote display (optional) The digital remote displays can be connected directly to the SIWAREX WP231 via the RS 485 interface. Suitable remote display: S102 **Siebert Industrieelektronik GmbH** **PO Box 1180** **D-66565 Eppelborn** **Tel.: +49 6806/980-0** **Fax: +49 6806/980-999** http://www.siebert-group.com/en Detailed information is available from the manufacturer.	

Technical specifications

SIWAREX WP521 ST / WP522 ST	
Weighing modes	• Non-automatic scales, e.g. platform and hopper scales
Ports	• 1 × SIMATIC S7-1500 system bus • 1 × Ethernet (SIWATOOL, Modbus TCP/IP) • 1 × RS 485 per channel (Modbus RTU or remote display) • 3 × digital inputs per channel (24 V DC) • 4 × digital outputs (24 V DC short-circuit proof) per channel
Functions	• 3 limits • Zeroing • Tare • Tare specification • Zero adjustment • Trace function for signal analysis • Internal restore point • SIMATIC S7-1500 integrated and/or stand-alone operation
Parameter assignment	• Using function block in SIMATIC S7-1500 and HMI • Using SIWATOOL V7 • Using Modbus TCP/IP • Using Modbus RTU
Remote display (see accessories)	
Connection	Via RS 485
Display	Additional display for weight value
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Number of measurements/second	100 or 120 (selectable)
Filter	• Low-pass filter 0.05 ... 50 Hz • Average value filter
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 × min/max • 1 × empty
Zeroing	Per command
Tare	Per command
Tare specification	Per command
Compatible sensors	Analog load cells / full-bridge strain gauges (1-4 mV/V) in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 ... 4 mV/V

Technical specifications (continued)

SIWAREX WP521 ST / WP522 ST	
Permissible range of the measurement signal (with 4 mV/V sensors)	-21.3 ... +21.3 mV
Max. distance of load cells	800 m (2 624 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Certificates	• ATEX Zone 2 • UL • KCC • EAC • RCM • FM • IECEx
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption WP521 ST / WP522 ST	120 mA / 200 mA
Max. power consumption SIMATIC Bus	35 mA @ 15 V
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements $T_{min\ (IND)}$ ... $T_{max\ (IND)}$ (operating temperature)	
• Horizontal installation	-10 ... +60 °C (14 ... 140 °F)
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
EMC requirements	According to IEC 61000-6-2:2004; IEC 61000-6-4:2007+A1:2011
Dimensions (W × H × D)	35 × 147 × 129 mm (1.38 × 5.79 × 5.08 inch)

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Overview



- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS TM Count 2x24V counter module (Extended temperature range and exposure to environmental substances) With 2 channels, max. 200 kHz; for 24 V encoder	**6AG1550-1AA01-7AB0**
Accessories	
SIPLUS S7-1500 U connector Spare part for connecting I/O modules; self-assembling backplane bus; 5 pieces per packaging unit; with conformal coating, -40...+70 °C	**6AG1590-0AA00-7AA0**
Other accessories	See SIMATIC S7-1500, TM Count 2x24V counter module

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Technical specifications

Article number	6AG1550-1AA01-7AB0 SIPLUS S7-1500 TM COUNT 2X24V
General information	
Product type designation	TM Count 2x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	1 A; total current of all encoders/channels
Digital inputs	
Number of digital inputs	6; 3 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
• Probe	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- Parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output

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Technical specifications (continued)

Article number	6AG1550-1AA01-7AB0 SIPLUS S7-1500 TM COUNT 2X24V
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Interface types	
• Sourcing/sinking input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED

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Technical specifications (continued)

Article number	6AG1550-1AA01-7AB0 SIPLUS S7-1500 TM COUNT 2X24V
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
• suitable for SIMOTION	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	40 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	

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Technical specifications (continued)

Article number	6AG1550-1AA01-7AB0 SIPLUS S7-1500 TM COUNT 2X24V
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	250 g

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Overview



- 2-channel counter and position detection module with RS422 interface
- Comprehensive parameterization options for optimum adaptation to the task
- Offloading of controller through preprocessing on the module
- Position detection with incremental and SSI absolute-value encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS422 signals or 5 V TTL signals

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS S7-1500 TM PosInput 2 Counter and position feedback module, 2 channels, for RS-422 incremental encoders or SSI absolute encoders, 2 DI, 2 DQ per channel, with conformal coating, -40...+70 °C	**6AG1551-1AB01-7AB0**
Accessories	
SIPLUS S7-1500 U connector With conformal coating, -40...+70 °C, spare part for connecting I/O modules; self-assembling backplane bus, 5 units per packing unit	**6AG1590-0AA00-7AA0**
Other accessories	See SIMATIC S7-1500, TM PosInput 2 counter and positioning module

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Technical specifications

Article number	6AG1551-1AB01-7AB0 SIPLUS S7-1500 TM POSINPUT 2
General information	
Product type designation	TM PosInput 2
Number of channels	2
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4; One 5V and 24V encoder supply per channel
5 V encoder supply	
• 5 V	Yes; 5.2 V ±2 %
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
Digital inputs	
Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- Parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	

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Technical specifications (continued)

Article number	6AG1551-1AB01-7AB0 SIPLUS S7-1500 TM POSINPUT 2
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.

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Technical specifications (continued)

Article number	6AG1551-1AB01-7AB0 SIPLUS S7-1500 TM POSINPUT 2
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs

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Technical specifications (continued)

Article number	6AG1551-1AB01-7AB0 SIPLUS S7-1500 TM POSINPUT 2
- Cycle duration measurement, max.	25 s
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; Please note derating for inductive loads
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	40 °C; Please note derating for inductive loads
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes

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Technical specifications (continued)

Article number	6AG1551-1AB01-7AB0 SIPLUS S7-1500 TM POSINPUT 2
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	325 g

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Overview



- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 Kbps
  - RS 232C, max. 115.2 Kbps
  - RS 422/RS 485, max. 19.2 Kbps
  - RS 422/RS 485, max. 250 Kbps
- Protocols supported
  - Freeport: user-parameterizable frame format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU master
  - Modbus RTU device
  - USS, implemented through instructions
  - Suitable for DMX512
  - Standard mode for large frames up to 4 KB
  - Performance mode: fast updating with many interfaces and shorter frames
  - Diagnostic trace: simple determination of the causes of connection faults

Selection and ordering data

SIMATIC S7-1500, CM PTP RS232 BA Communications module for serial connection RS-232 Freeport, 3964 (R), USS, 19200 bps, 9-pin D-sub connector	**6ES7540-1AD01-0AA0**
SIMATIC S7-1500, CM PTP RS232 HF Communications module for serial connection RS-232 Freeport, 3964 (R), USS, MODBUS RTU master, device, 115200 bps, 9-pin D-sub connector	**6ES7541-1AD01-0AB0**
SIMATIC S7-1500, CM PTP RS422/485 BA Communications module for serial connection RS422, RS485 Freeport, 3964 (R), USS, 19200 bps, 15-pin D-sub socket	**6ES7540-1AB01-0AA0**
SIMATIC S7-1500, CM PTP RS-422/485 HF Communications module for serial connection RS-422 and RS-485 Freeport, 3964 (R), USS, MODBUS RTU master, device, 250 000 bps, 15-pin D-sub socket	**6ES7541-1AB01-0AB0**
Accessories	
SIMATIC S7-1500, spare part front door For the 35 mm wide power supply and PTP CP 5 units per packing unit	**6ES7528-0AA80-7AA0**
RS 232 connecting cable	
SIMATIC S7/M7, cable for point-to-point connection RS-232C-RS-232C, 9-pin D-sub socket respectively 5 m long	**6ES7902-1AB00-0AA0**
SIMATIC S7/M7, cable for point-to-point connection RS-232C-RS-232C, 9-pin D-sub socket respectively 10 m long	**6ES7902-1AC00-0AA0**
SIMATIC S7/M7, cable for point-to-point connection RS-232C-RS-232C, 9-pin D-sub socket respectively 15 m long	**6ES7902-1AD00-0AA0**
RS 422/485 connecting cable	
SIMATIC S7/M7, cable for point-to-point connection RS-422-RS-422, 15-pole D-sub pins respectively 5 m long	**6ES7902-3AB00-0AA0**
SIMATIC S7/M7, cable for point-to-point connection RS-422-RS-422, 15-pole D-sub pins respectively 10 m long	**6ES7902-3AC00-0AA0**
SIMATIC S7/M7, cable for point-to-point connection RS-422-RS-422, 15-pole D-sub pins respectively 50 m long	**6ES7902-3AG00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7540-1AD01-0AA0 S7-1500, CM PTP RS232 BA	6ES7541-1AD01-0AB0 S7-1500, CM PTP RS232 HF	6ES7540-1AB01-0AA0 S7-1500, CM PTP RS422/485 BA	6ES7541-1AB01-0AB0 S7-1500, CM PTP RS422/485 HF
General information				
Product type designation	CM PtP RS 232 BA	CM PtP RS 232 HF	CM PtP RS 422 / 485 BA	CM PtP RS 422 / 485 HF
Product function				
• I&M data	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0
• Fast startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	V18 with HSP 0367 / V19; with older TIA Portal versions configurable as 6ES7540-1AD00-0AA0	V18 with HSP 0367 / V19; configurable with older TIA Portal versions as 6ES7541-1AD00-0AB0	V18 with HSP 0367 / V19; with older TIA Portal versions configurable as 6ES7540-1AB00-0AA0	V18 with HSP 0367 / V19; configurable with older TIA Portal versions as 6ES7541-1AB00-0AB0
• STEP 7 configurable/integrated from version	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file
• PROFIBUS from GSD version/GSD revision	- / -	- / -	- / -	- / -
• PROFINET from GSD version/GSD revision	GSDML V2.42	GSDML V2.42	GSDML V2.42	GSDML V2.42
Installation type/mounting				
Rail mounting	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail
Interface types				
RS 232				
• Transmission rate, max.	19.2 kbit/s	115.2 kbit/s		
• Cable length, max.	15 m	15 m		
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD	RTS, CTS, DTR, DSR, RI, DCD		
RS 485				
• Transmission rate, max.			19.2 kbit/s	250 kbit/s
• Cable length, max.			1 200 m	1 200 m
RS 422				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m
• 4-wire full duplex connection			Yes	Yes
• 4-wire multipoint connection			No	No
Protocols				
Integrated protocols				
- Freeport				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
- 3964 (R)				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
- Modbus RTU master				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
- max. number of devices		1		32
- Modbus RTU device				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
Telegram buffer				
• Buffer memory for telegrams	2 kbyte	8 kbyte	2 kbyte	8 kbyte
• Number of telegrams which can be buffered	255	255	255	255
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7540-1AD01-0AA0 S7-1500, CM PTP RS232 BA	6ES7541-1AD01-0AB0 S7-1500, CM PTP RS232 HF	6ES7540-1AB01-0AA0 S7-1500, CM PTP RS422/485 BA	6ES7541-1AB01-0AB0 S7-1500, CM PTP RS422/485 HF
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	No	No	No	No
Diagnoses				
• Wire break	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• Receive RxD	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Transmit TxD	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
Potential separation				
between backplane bus and interface	Yes	Yes	Yes	Yes
Security				
signed firmware update	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual
Decentralized operation				
to SIMATIC S7-300	Yes	Yes	Yes	Yes
to SIMATIC S7-400	Yes	Yes	Yes	Yes
to SIMATIC S7-1500	Yes	Yes	Yes	Yes
to standard PROFINET controller	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	127 mm	127 mm	127 mm	127 mm
Weights				
Weight, approx.	0.22 kg	0.22 kg	0.22 kg	0.22 kg

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Overview



- Communications module for connecting up to 8 IO-Link devices (three-wire connection) or 8 standard sensors
- Can be used directly downstream of an S7-1500 CPU or distributed in ET 200MP via PROFINET or PROFIBUS
- Powerful diagnostics functions facilitate preventive maintenance to avoid plant standstills
- Easy replacement of sensors/actuators without time-consuming parameter assignment

Selection and ordering data

S7-1500, CM 8xIO-Link, communications module IO-Link Master V1.1 order front connectors (screw terminals or push-in) separately	**6ES7547-1JF00-0AB0**
Accessories	
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7547-1JF00-0AB0 S7-1500, CM 8xIO-Link
General information	
Product type designation	CM 8xIO-Link
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V15.1 with HSP 274
• STEP 7 configurable/integrated from version	Configurable via GSD file
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.34
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
Output current	
• Rated value	1 A; 4 A total current per module
24 V encoder supply	
• Short-circuit protection	Yes; per channel, electronic
IO-Link	
Number of ports	8
• of which simultaneously controllable	8
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Cycle time, min.	2 ms
Size of process data, input per port	33 byte; max.
Size of process data, input per module	240 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	240 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m
Time Based IO	
• TIO IO-Link IN	No
• TIO IO-Link OUT	No
• TIO IO-Link IN/OUT	No
Connection of IO-Link devices	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED

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Technical specifications (continued)

Article number	6ES7547-1JF00-0AB0 S7-1500, CM 8xIO-Link
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	40 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm

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Overview



DP-M	DP-S	FMS	PG/OP	S7
●	●		●	●

G_IK10_XX_10148

The CM 1542-5 communications module adds a PROFIBUS connection to the SIMATIC S7-1500 controller for communication with lower-level PROFIBUS devices at transfer rates of 9.6 Kbps to 12 Mbps. The module can also be used to implement separate PROFIBUS lines, in other words, to control a number of different field devices via a number of PROFIBUS segments. The CM 1542-5 assumes all communication tasks, thus reducing the CPU workload.

The CM 1542-5 is suitable for S7 communication as well as for conventional PROFIBUS communication. This makes it possible to establish communication between the S7-1500 PLC and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 Kbps)
- Communications services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
  - Open user communication (SEND/RECEIVE) via FDL
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without programming device/engineering station
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Hardware innovations of the CM 1542-5 product with new article number 6GK7542-5DX10-0XE0 extend the permissible ambient temperature for operation from -30 °C to 60 °C (no condensation or icing) for a horizontally mounted rack and -30 °C to 40 °C (no condensation or icing) for a vertically mounted rack.

Furthermore, the permissible installation altitude for the CM 1542-5 module (6GK7542-5DX10-0XE0) has been extended to installation altitudes of up to 5000 m.

Selection and ordering data

	Article No.
CM 1542-5 communications module Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; S7 and PG/OP communication, data record routing, time synchronization, diagnostics	**6GK7542-5DX10-0XE0**

Accessories

	Article No.
PROFIBUS FastConnect RS485 connection plug With 90° cable outlet; with insulation displacement terminals, max. transfer rate 12 Mbps	
• Without programming device interface	**6ES7972-0BA52-0XA0**
• With programming device interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC standard cable 2-core bus cable, shielded, special design for fast installation, sold by the meter; delivery unit: max. 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M Bus terminal for connection of PROFIBUS stations up to 12 Mbps with connecting cable	**6GK1500-0AA10**

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Technical specifications

Article number product type designation	6GK7542-5DX10-0XE0 CM 1542-5	6AG1542-5FX10-7XE0 CP 1542-5
product brand name	SIMATIC NET	SIPLUS
Technical Product Detail Page	https://i.siemens.com/1P6GK7542-5DX10-0XE0	https://i.siemens.com/1P6AG1542-5FX10-7XE0
transfer rate		
transfer rate		
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s	9.6 kbit/s ... 12 Mbit/s
interfaces		
number of interfaces according to Industrial Ethernet	0	0
number of electrical connections		
• at the 1st interface according to PROFIBUS	1	1
type of electrical connection		
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS485)	9-pin Sub-D socket (RS485)
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	DC
supply voltage 1 from backplane bus	15 V	15 V
relative symmetrical tolerance at DC		
• at 15 V	3 %	3 %
consumed current		
• from backplane bus at DC at 15 V typical	0.2 A	0.2 A
power loss [W]	3 W	3 W
ambient conditions		
ambient temperature		
• for vertical installation during operation	-30 ... +40 °C	-40 ... +40 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C	-40 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
• note	without condensation or icing	
installation altitude at height above sea level maximum	5 000 m	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	restrictions for installation altitudes > 2 000 m, see manual	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity		
• at 25 °C without condensation during operation maximum	95 %	
• with condensation according to IEC 60068-2-38 maximum		100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants		Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances		
• conformity according to EN 60721-3-3		Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity according to EN 60721-3-6		Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
resistance to chemically active substances		
• conformity according to EN 60721-3-3		Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity according to EN 60721-3-6		Yes
resistance to mechanically active substances		
• conformity according to EN 60721-3-3		Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity according to EN 60721-3-6		Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board according to EN 61086		Yes; Class 2 for high availability

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Technical specifications (continued)

Article number	6GK7542-5DX10-0XE0	6AG1542-5FX10-7XE0
product type designation	CM 1542-5	CP 1542-5
type of coating protection against pollution according to EN 60664-3		Yes; Protection of the type 1
type of test of the coating according to MIL-I-46058C		Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A		Yes; Conformal coating, class A
protection class IP	IP20	IP20
design, dimensions and weights		
module format	Compact module S7-1500 single width	Compact module S7-1500 single width
width	35 mm	35 mm
height	142 mm	142 mm
depth	129 mm	129 mm
net weight	0.4 kg	0.4 kg
fastening method		
• S7-1500 rail mounting	Yes	Yes
product features, product functions, product components general		
number of units		
• per CPU maximum	8	8
• note	depending on CPU type	depending on CPU type
performance data open communication		
number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	30	
data volume		
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte	
performance data PROFIBUS DP		
service as DP master		
• DPV1	Yes	Yes
number of DP devices		
• on DP master operable	125	32
data volume		
• of the address range of the inputs as DP master total	8 192 byte	2 048 byte
• of the address range of the outputs as DP master total	8 192 byte	2 048 byte
• of the address range of the inputs per DP device	244 byte	244 byte
• of the address range of the outputs per DP device	244 byte	244 byte
service as DP device		
• DPV0	Yes	Yes
• DPV1	Yes	Yes
data volume		
• of the address range of the inputs as DP device total	240 byte	240 byte
• of the address range of the outputs as DP device total	240 byte	240 byte
performance data S7 communication		
number of possible connections for S7 communication		
• maximum	48; depending on the system upper limit	16; depending on the system upper limit
performance data multi-protocol mode		
number of active connections with multi-protocol mode	48	16
performance data telecontrol		
protocol is supported		
• TCP/IP	No	No
product functions management, configuration, engineering		
configuration software		
• required	STEP 7 Professional V18 (TIA Portal) or higher	STEP 7 Professional V18 (TIA Portal) or higher
identification & maintenance function		
• I&M0 - device-specific information	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes

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Technical specifications (continued)

Article number product type designation	6GK7542-5DX10-0XE0 CM 1542-5	6AG1542-5FX10-7XE0 CP 1542-5
product function is supported identification link	Yes; acc. to IEC 61406-1:2022	
product functions diagnostics		
product function web-based diagnostics	Yes; via S7-1500 CPU	Yes; via S7-1500 CPU
product functions time		
product function pass on time synchronization	Yes	Yes
standards, specifications, approvals		
certificate of suitability CE marking	Yes	
certificate of suitability UKCA marking	Yes	
certificate of suitability cULus approval	Yes	
certificate of suitability KC approval	Yes	
certificate of suitability Regulatory Compliance Mark (RCM)	Yes	
certificate of suitability RoHS conformity	Yes	
certificate of suitability EAC approval	Yes	
standards, specifications, approvals hazardous environments header		
certificate of suitability ATEX	Yes	
certificate of suitability IECEx	Yes	
certificate of suitability ULhazloc approval	Yes	
certificate of suitability CCC for hazardous zone according to GB standard	Yes	
certificate of suitability FM registration	Yes	
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	115.52 kg	115.52 kg
• during manufacturing	21.24 kg	21.24 kg
• during operation	93.93 kg	93.93 kg
• after end of life	0.35 kg	0.35 kg
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com

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Overview



DP-M	DP-S	FMS	PG/OP	S7/S5
●	●		●	●

G_IK10_XX_10144

The CP 1542-5 communications processor expands the SIMATIC S7-1500 controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in transfer rates from 9.6 Kbps to 12 Mbps. This CPU allows the implementation of separate PROFIBUS lines, in other words the control of multiple field devices over multiple PROFIBUS segments. The CP 1542-5 handles all communication tasks, thus reducing the CPU load.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 Kbps)

Communications services:

- PROFIBUS DP
- PG/OP communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without programming device/engineering station

Hardware innovations of the CP 1542-5 product with new article number 6GK7542-5FX10-0XE0 extend the permissible ambient temperature for operation from -30 °C to 60 °C (no condensation or icing) for a horizontally mounted rack and -30 °C to 40 °C (no condensation or icing) for a vertically mounted rack.

In addition, the permissible installation altitude for the CP 1542-5 module (6GK7542-5FX10-0XE0) has been extended to installation altitudes of up to 5000 m.

The use of innovative, high-quality hardware components to fulfill the requirements listed above results in higher power consumption from the backplane bus in the new product CP 1542-5 (6GK7542-5FX10-0XE0) compared with the predecessor product.

Selection and ordering data

	Article No.
CP 1542-5 communications processor Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; PG/OP communication, time synchronization, diagnostics; smaller quantity structure	**6GK7542-5FX10-0XE0**

Accessories

	Article No.
PROFIBUS FastConnect RS485 connection plug With 90° cable outlet; with insulation displacement terminals, max. transfer rate 12 Mbps	
• Without programming device interface	**6ES7972-0BA52-0XA0**
• With programming device interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC standard cable 2-core bus cable, shielded, special design for fast installation, sold by the meter; delivery unit: max. 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M Bus terminal for connection of PROFIBUS stations up to 12 Mbps with connecting cable	**6GK1500-0AA10**

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Technical specifications

Article number	6GK7542-5FX10-0XE0
product type designation	CP 1542-5
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7542-5FX10-0XE0
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	0
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
type of electrical connection	
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS485)
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.2 A
power loss [W]	3 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +40 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
• note	without condensation or icing
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	restrictions for installation altitudes > 2 000 m, see manual
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.4 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	8
• note	depending on CPU type

Technical specifications (continued)

Article number	6GK7542-5FX10-0XE0
product type designation	CP 1542-5
performance data PROFIBUS DP	
service as DP master	
• DPV1	Yes
number of DP devices	
• on DP master operable	32
data volume	
• of the address range of the inputs as DP master total	2 048 byte
• of the address range of the outputs as DP master total	2 048 byte
• of the address range of the inputs per DP device	244 byte
• of the address range of the outputs per DP device	244 byte
service as DP device	
• DPV0	Yes
• DPV1	Yes
data volume	
• of the address range of the inputs as DP device total	240 byte
• of the address range of the outputs as DP device total	240 byte
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	16; depending on the system upper limit
performance data multi-protocol mode	
number of active connections with multi-protocol mode	16
performance data telecontrol	
protocol is supported	
• TCP/IP	No
product functions management, configuration, engineering	
configuration software	
• required	STEP 7 Professional V18 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions time	
product function pass on time synchronization	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability cULus approval	Yes
certificate of suitability KC approval	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes

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Technical specifications (continued)

Article number product type designation	6GK7542-5FX10-0XE0 CP 1542-5
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability ULhazloc approval	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	115.52 kg
• during manufacturing	21.24 kg
• during operation	93.93 kg
• after end of life	0.35 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●	●	●	●	●

G_IK10_XX_10363

Communications module for connecting a SIMATIC S7-1500 to PROFINET networks as PROFINET IO controller or PROFINET IO device.

The CM 1542-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication;
  - Web diagnostics by means of access to the web server of the S7-1500 system
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1543-1/CM 1542-1 units in an S7-1500 system, e.g. for web server access without real-time capability

Hardware innovations of the CM 1542-1 product with new Article No. 6GK7542-1AX10-0XE0 extend the permissible ambient temperature for operation from -30 °C to 60 °C (no condensation or icing) for a horizontally mounted rack and -30 °C to 40 °C (no condensation or icing) for a vertically mounted rack.

Furthermore, the permissible installation altitude for the module CM 1542-1 (6GK7542-1AX10-0XE0) has been extended to installation altitudes of up to 5000 m.

Selection and ordering data

	Article No.
CM 1542-1 communications module For connecting SIMATIC S7-1500 to PROFINET IO, TCP/IP, ISO-on-TCP, UDP, S7 communication, IP broadcast/multicast, SNMPV1, time synchronization via NTP; 2 x RJ45 interface with 100 Mbps	**6GK7542-1AX10-0XE0**

Accessories

	Article No.
IE FC RJ45 plug 4 x 2 RJ45 connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6$_A$) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB12-2AA0**
• 1 pack = 10 units	**6GK1901-1BB12-2AB0**
• 1 pack = 50 units	**6GK1901-1BB12-2AE0**
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
SCALANCE XC206-2SFP G Industrial Ethernet switch Manageable Layer 2 IE switch IEC 62443-4-2 certified 6x 10/100/1000 Mbps RJ45 ports 2x 1000 Mbps SFP 1x console port	**6GK5206-2GS00-2AC2**

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Technical specifications

Article number	6GK7542-1AX10-0XE0
product type designation	CM 1542-1
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7542-1AX10-0XE0
transfer rate	
transfer rate	
• at the 1st interface	100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.22 A
power loss [W]	3.3 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +40 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
• note	without condensation or icing
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	restrictions for installation altitudes > 2 000 m, see manual
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.4 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	8
• note	depending on CPU type

Technical specifications (continued)

Article number	6GK7542-1AX10-0XE0
product type designation	CM 1542-1
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	64; depending on the system upper limit
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
number of Multicast stations	6
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	64; depending on the system upper limit
performance data multi-protocol mode	
number of active connections with multi-protocol mode	64
performance data PROFINET communication as PN IO controller	
product function PROFINET IO controller	Yes
number of PN IO devices on PROFINET IO controller operable total	128
number of PN IO IRT devices on PROFINET IO controller operable	64
number of external PN IO lines with PROFINET per rack	10
data volume	
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for output variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
performance data PROFINET communication as PN IO device	
product function PROFINET IO device	Yes
data volume	
• as user data for input variables as PROFINET IO device maximum	8 192 byte
• as user data for output variables as PROFINET IO device maximum	8 192 byte
• as user data for input variables for each sub-module as PROFINET IO device	256 byte
• as user data for output variables for each sub-module as PROFINET IO device	256 byte
• as user data for the consistency area for each sub-module	256 byte

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Technical specifications (continued)

Article number product type designation	6GK7542-1AX10-0XE0 CM 1542-1
number of submodules per PROFINET IO-Device	32
performance data telecontrol	
protocol is supported	
• TCP/IP	Yes
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V18 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions switch	
product feature switch	Yes
product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• configuration with STEP 7	Yes
product functions routing	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
product functions redundancy	
product function	
• ring redundancy	Yes
• redundancy manager	Yes
protocol is supported Media Redundancy Protocol (MRP)	Yes
product functions security	
product function	

Technical specifications (continued)

Article number product type designation	6GK7542-1AX10-0XE0 CM 1542-1
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	No
product functions time	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability cULus approval	Yes
certificate of suitability KC approval	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability ULhazloc approval	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	124.91 kg
• during manufacturing	21.24 kg
• during operation	103.31999 kg
• after end of life	0.35 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●	●	●	●

G_IK10_XX_10353

The SIMATIC CP 1543-1 communications processor securely connects the SIMATIC S7-1500 PLC to Industrial Ethernet networks. By combining a variety of security features such as stateful packet inspection firewalls and VPNs, and data encryption protocols such as FTPS and SNMPv3, the communications processor protects individual S7-1500 stations or even entire automation cells against unauthorized access.

The CP can also be used for integrating the S7-1500 station into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1543-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open user communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Access (read and write modes) to csv files stored on the memory card of the CPU via FTP(S)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1543-1 / CM 1542-1 units in an S7-1500 system, e.g. for web server access without real-time capability
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
  - Network authentication according to IEEE 802.1X using the EAP methods MD5, TLS, PEAP, TTLS, MSCHAPv2 or PWD

Overview (continued)

- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure time of day transfer (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
  - Encrypted email communication via SMTPS (Port 587)
  - Secure open communication over TCP/IP
  - Connection to SINEMA Remote Connect via OpenVPN
- Integration of the S7-1500 into IPv6-based networks;
  An IPv6-compliant IP address can be used for the following communications services:
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing via program block
  - Email transfer with addressing via program block

Hardware innovations of the CP 1543-1 product with new article number 6GK7543-1AX10-0XE0 extend the permissible ambient temperature for operation from -30 °C to 60 °C (no condensation or icing) for a horizontally mounted rack and -30 °C to 40 °C (no condensation or icing) for a vertically mounted rack.

In addition, the permissible installation altitude for the module CP 1543-1 (6GK7543-1AX10-0XE0) has been extended up to 5 000 m.

Selection and ordering data

	Article No.
Communications processor CP 1543-1 For connecting SIMATIC S7-1500 to Industrial Ethernet; TCP/IP, ISO, UDP, S7 communication, IP broadcast/multicast, security (VPN, firewall) diagnostics SNMPv1/v3, DHCP, FTP client/server, email, IPv4/IPv6, IEEE 802.1X (radius), time synchronization via NTP, 1x RJ45 (10/100/1 000 Mbps)	**6GK7543-1AX10-0XE0**

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Accessories

	Article No.
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6$_A$) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB12-2AA0**
• 1 pack = 10 units	**6GK1901-1BB12-2AB0**
• 1 pack = 50 units	**6GK1901-1BB12-2AE0**
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
SCALANCE XC206-2SFP Industrial Ethernet switch Manageable Layer 2 IE switch; IEC 62443-4-2 certified; 6x 10/100 Mbps RJ45 ports; 2x 100/1000 Mbps SFP; 1x console port	**6GK5206-2BS00-2AC2**

Technical specifications

Article number	**6GK7543-1AX10-0XE0**
product type designation	**CP 1543-1**
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7543-1AX10-0XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.25 A
power loss [W]	3.75 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +40 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
• note	without condensation or icing
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	restrictions for installation altitudes > 2 000 m, see manual
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.26 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	8
• note	depending on CPU type

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Technical specifications (continued)

Article number	6GK7543-1AX10-0XE0
product type designation	CP 1543-1
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
number of Multicast stations	118
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	118; depending on the system upper limit
performance data multi-protocol mode	
number of active connections with multi-protocol mode	118
performance data IT functions	
number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
number of possible connections	
• as server by means of HTTP maximum	4
• as email client maximum	1
data volume as user data for email maximum	64 Kibyte
performance data telecontrol	
protocol is supported	
• TCP/IP	Yes
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V19 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions routing	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No

Technical specifications (continued)

Article number	6GK7543-1AX10-0XE0
product type designation	CP 1543-1
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
product functions security	
firewall version	stateful inspection
product function with VPN connection	IPSec
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1, SHA-256, SHA-384, SHA-512
number of possible connections with VPN connection	16
product function	
• IEEE 802.1x (radius)	Yes
• password protection for Web applications	No
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	Yes
product functions time	
product function SICLOCK support	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability cULus approval	Yes
certificate of suitability KC approval	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability ULhazloc approval	Yes

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Technical specifications (continued)

Article number product type designation	6GK7543-1AX10-0XE0 CP 1543-1
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	140.88 kg
• during manufacturing	21.24 kg
• during operation	119.29 kg
• after end of life	0.35 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●	●	●	●

G_IK10_XX_10353

The SIMATIC CP 1545-1 communications processor securely connects the SIMATIC S7-1500 PLC to Industrial Ethernet networks. The new CloudConnect functionality enables easy and reliable transfer of all selected data from the SIMATIC S7-1500 to a cloud solution that supports the standardized MQTT protocol, e.g. Microsoft Azure or IBM Cloud or Amazon Web Services (AWS). The CP protects the SIMATIC S7-1500 station from unauthorized access with the integrated SPI (Stateful Packet Inspection) firewall. Data from cloud systems or MQTT brokers can also be received using the MQTT protocol.

The CloudConnect function of the CP 1545-1 is easy to configure with a few input screens in TIA Portal. First, all the parameters required for the different cloud platforms are specified. The data intended for the cloud is then selected from the tag management of the SIMATIC S7-1500 and saved as topics to be transferred with the corresponding trigger conditions.

All functions are configured using STEP 7 Professional V15.1 update 3 (TIA Portal) or higher.
The CP 1545-1 supports the following communications services:

Overview (continued)

- PG/OP communication
- S7 communication
- Open user communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - MQTT Publish for transferring selected data to a cloud system or MQTT broker
  - MQTT Subscribe for receiving data from a cloud system or MQTT broker
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Access (read and write modes) to csv files stored on the memory card of the CPU via FTP(S)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1545-1 / CP 1543-1 / CM 1542-1 units in the S7-1500 system, e.g. for web server accesses without real-time capability
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
  - Network authentication according to IEEE 802.1X using the EAP methods MD5, TLS, PEAP, TTLS, MSCHAPv2 or PWD in the product CP 1545-1 (6GK7545-1GX10-0XE0)
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure time of day transfer (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
  - Encrypted email communication via SMTPS (Port 587)
  - Secure open communication over TCP/IP
  - Connection of the new product CP 1545-1 (6GK7545-1GX10-0XE0) to SINEMA Remote Connect via OpenVPN
- Integration of the S7-1500 into IPv6-based networks
  An IPv6-compliant IP address can be used for the following communications services:
  - MQTT
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing via program block
  - Email transfer with addressing via program block

Hardware innovations of the CP 1545-1 product with new article number 6GK7545-1GX10-0XE0 extend the permissible ambient temperature for operation from -30 °C to 60 °C (no condensation or icing) for a horizontally mounted rack and -30 °C to 40 °C (no condensation or icing) for a vertically mounted rack.

In addition, the permissible installation altitude for the CP 1545-1 module (6GK7545-1GX10-0XE0) has been extended to installation altitudes of up to 5000 m.

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Selection and ordering data

	Article No.
CP 1545-1 communications processor CP 1545-1 communications processor for connecting the SIMATIC S7-1500 to Industrial Ethernet; TCP/IP, UDP, S7 communication, security (VPN, firewall), SNMPv1/v3, DHCP, FTP client/server, email, IPv4/IPv6, IEEE 802.1X (Radius), time synchronization via NTP, connection to cloud systems via MQTT, 1x RJ45 (10/100/1000 Mbps)	**6GK7545-1GX10-0XE0**

Accessories

	Article No.
IE FC RJ45 plug 180 2 x 2 RJ45 connector for Industrial Ethernet with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 4 x 2 RJ45 connector for Industrial Ethernet (10/100/1000/10000 Mbps, $Cat6_A$) with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB12-2AA0**
• 1 pack = 10 units	**6GK1901-1BB12-2AB0**
• 1 pack = 50 units	**6GK1901-1BB12-2AE0**
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
SCALANCE XC206-2SFP Industrial Ethernet switch Manageable Layer 2 IE switch; IEC 62443-4-2 certified; 6x 10/100 Mbps RJ45 ports; 2x 100/1000 Mbps SFP; 1x console port	**6GK5206-2BS00-2AC2**

Technical specifications

Article number	6GK7545-1GX10-0XE0
product type designation	CP 1545-1
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7545-1GX10-0XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.25 A
power loss [W]	3.75 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +40 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
• note	without condensation or icing
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	restrictions for installation altitudes > 2 000 m, see manual
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm
depth	129 mm
net weight	0.26 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	8
• note	depending on CPU type

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Technical specifications (continued)

Article number	6GK7545-1GX10-0XE0
product type designation	CP 1545-1
product functions cloud connectivity	
protocol is supported	
• Message Queuing Telemetry Transport (MQTT)	Yes
• Advanced Message Queuing Protocol (AMQP)	No
product function for cloud connectivity	
• trigger management	Yes
• time stamping	Yes
product feature for cloud connectivity buffered message frame memory	No
number of data points per device maximum	500
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
number of Multicast stations	118
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	118; depending on the system upper limit
performance data multi-protocol mode	
number of active connections with multi-protocol mode	118
performance data IT functions	
number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
number of possible connections	
• as server by means of HTTP maximum	4
• as email client maximum	1
data volume as user data for email maximum	64 Kibyte
performance data telecontrol	
protocol is supported	
• TCP/IP	Yes
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V19 (TIA Portal) or higher

Technical specifications (continued)

Article number	6GK7545-1GX10-0XE0
product type designation	CP 1545-1
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions routing	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
product functions security	
firewall version	stateful inspection
product function with VPN connection	IPSec
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1, SHA-256, SHA-384, SHA-512
number of possible connections with VPN connection	16
product function	
• IEEE 802.1x (radius)	Yes
• password protection for Web applications	No
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	Yes
product functions time	
product function SICLOCK support	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes

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Technical specifications (continued)

Article number product type designation	6GK7545-1GX10-0XE0 CP 1545-1
certificate of suitability cULus approval	Yes
certificate of suitability KC approval	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability ULhazloc approval	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	140.88 kg
• during manufacturing	21.24 kg
• during operation	119.29 kg
• after end of life	0.35 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



- TIM 1531 IRC communications module for telecontrol applications with four interfaces as a stand-alone device for SIMATIC S7-1500, S7-400, S7-300 and ET 200SP for use in wide area networks (WANs)
- For universal use in a station, node station and control center
- Communication either via the SINAUT ST7, IEC 60870-5-101/104 or DNP3 telecontrol protocols
- Operation via VPN (IPsec/OpenVPN) with additional SIMATIC NET components
- Wireless communication via mobile wireless routers, modems or radio devices
- Wired communication via Ethernet, internet, 2-/4-wire cables (SHDSL), dial-up modems or dedicated line modem
- Frame buffer for seamless recording of data
- Support of redundant communication paths
- Simple configuration with STEP 7 Professional (TIA Portal)
- Device redundancy TIM 1531 IRC (as station): Redundant telecontrol connection of an S7-1500R/H system to a PCS 7 process control system

Selection and ordering data

	Article No.
TIM 1531 IRC communications module TIM 1531 IRC communications module for SIMATIC S7-1500, S7-400, S7-300 and ET 200 SP with SINAUT ST7, DNP3 and IEC 60870-5-101/104 with three RJ45 interfaces for communication via IP-based networks (WAN/LAN) and an RS 232/RS 485 interface for communication via conventional WANs	6GK7543-1MX00-0XE0
STEP 7 Professional V19 engineering software	
• SIMATIC STEP 7 Professional V19 floating license	6ES7822-1AE23-0YA5
• Upgrade SIMATIC STEP 7 Basic V11 ... V18 → V19 floating license	6ES7822-0AE23-0YE5

Accessories

	Article No.
Mounting rail SIMATIC S7-1500, 160 mm mounting rail; incl. grounding screw, integrated DIN rail for mounting small items, such as terminals, relays	6ES7590-1AB60-0AA0
SIMATIC Memory Card SIMATIC S7, Memory Card for S7-1x 00 CPU/SINAMICS, 3.3 V flash, 24 MB	6ES7954-8LF03-0AA0
SCALANCE M876-4 4G router; for wireless IP communication of Ethernet-based programmable controllers via LTE (4G) mobile wireless optimized for worldwide use, VPN, firewall, NAT; 4-port switch; 2 x SMA antenna, MIMO technology; 1 x digital input, 1 x digital output; note country approvals!	6GK5876-4AA10-2BA2
SCALANCE MUM853-1 5G router (EU), IP30, for wireless IP communication of Ethernet-based applications via public 3/4/5G mobile wireless networks and private 5G networks, VPN, firewall, NAT, IPv6, connection to SINEMA RC via CLP, 4 SMA connectors, 1 x micro SIM slot, 4 x 10/100/1000 Mbps RJ45 port, redundant 24 V DC, -30 ... +60 °C, CLP slot, 1 x DI and 1 x DQ, note country approvals!	6GK5853-2EA00-2DA1
SCALANCE M826-2 SHDSL router For IP communication via the 2-wire and 4-wire cables of Ethernet-based programmable controllers; SHDSL topology: point-to-point, bonding, line bridge mode, routing mode with VPN, firewall, NAT; 4-port switch, 1 x digital input, 1 x digital output	6GK5826-2AB00-2AB2
SITOP compact 24 V/0.6 A 1-phase power supply with wide-range input 85 ... 264 V AC/110 to 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	6EP1331-5BA00
SIMATIC PM 1507 24 V/3 A Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A	6EP1332-4BA00
SIMATIC PM 1507 24 V/8 A Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	6EP1333-4BA00

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Technical specifications

Article number	6GK7543-1MX00-0XE0
product type designation	TIM 1531 IRC
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7543-1MX00-0XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
• at the 2nd interface	10 ... 100 Mbit/s
• at the 3rd interface	10 ... 100 Mbit/s
• according to RS 232	300 ... 115 200 bit/s
interfaces	
number of interfaces according to Industrial Ethernet	3
number of electrical connections	
• for external data transmission according to RS 232	1
• for power supply	1
number of slots	
• for memory cards	1
type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
type of electrical connection	
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• for power supply	2-pole plugable terminal block
slot version	
• of the memory card	SD 1.0, SD 1.1, SDHC, Siemens SMC
storage capacity of the memory card maximum	32 Gibyte
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	20.4 ... 28.8 V
supply voltage external at DC rated value	24 V
supply voltage external at DC rated value	20.4 ... 28.8 V
consumed current	
• from external supply voltage at DC at 24 V typical	0.15 A
• from external supply voltage at DC at 24 V maximum	0.3 A
power loss [W] with external supply voltage at 24 V DC	
• in update mode typical	3.9 W
• in communication mode typical	3.9 W
product extension optional backup battery	No
ambient conditions	
ambient temperature	
• during operation	0 ... 70 °C
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	

Technical specifications (continued)

Article number	6GK7543-1MX00-0XE0
product type designation	TIM 1531 IRC
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1500 double-wide
width	70 mm
height	147 mm
depth	129 mm
net weight	0.525 kg
fastening method	
• 35 mm DIN-rail mounting	No
• S7-300 rail mounting	No
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
product function	
• DynDNS client	No
number of units	
• note	Number of TIM per S7-1500: 1
wire length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	132; only via LAN
• with PG connections maximum	4
• with PG/OP connections maximum	4
• with OP connections maximum	4
service	
• of SIMATIC communication as server	Yes
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
performance data IT functions	
number of possible connections	
• as server by means of HTTP maximum	2
• as server by means of HTTPS maximum	2; 2 per Ethernet interface
• as email client maximum	1
performance data telecontrol	
suitability for use	
• node station	Yes
• substation	Yes
• TIM control center	Yes
control center connection	Systems with ST7, DNP3 and IEC 60870-5-101/104 protocol
• by means of a permanent connection	Systems with ST7, DNP3 and IEC 60870-5-101/104 protocol
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	Yes

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Technical specifications (continued)

Article number	6GK7543-1MX00-0XE0
product type designation	TIM 1531 IRC
• Modbus RTU	No
product function data buffering if connection is aborted	Yes; 100000 data telegrams (ST7) or 250000 events (IEC 60870-5 / DNP3)
number of data points per device maximum	3 000
number of DNP3 masters	
• for Ethernet maximum	4
• with RS 232 interface maximum	4
product feature buffered message frame memory	Yes
transmission format	
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure
• with dial-up network with SINAUT ST7 protocol	spontaneous
hamming distance	
• for SINAUT ST7 protocol	4
performance data teleservice	
diagnostics function online diagnostics with SIMATIC STEP 7	Yes
product function	
• program download with SIMATIC STEP 7	Yes
• remote firmware update	Yes
• remote configuration	Yes
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 SP1 (TIA Portal) or higher
• for CPU configuring required SINAUT TD7 block library for CPU	No
• for PG configuring required SINAUT ST7 configuration software for PG	No
storage location of TIM configuration data	Flash or SD card of the TIM 1531 IRC
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
• I&M2 - installation date	Yes
• I&M3 - comment	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes
product functions routing	
service routing note	IP routing up to 1 Mbps

Technical specifications (continued)

Article number	6GK7543-1MX00-0XE0
product type designation	TIM 1531 IRC
product function	
• static IP routing	Yes
• static IP routing IPv6	Yes
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
product functions security	
product function	
• MSC client via GPRS modem with MSC capability	Yes
protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
key length for MSC with Virtual Private Network	128 bit
number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	127
product functions time	
product function SICLOCK support	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
product component hardware real time clock	No
product feature hardware real time clock w. battery backup	No
time synchronization	
• from NTP-server	Yes
• from GPS-signal	No
• from control center	Yes
• from mobile network provider	No
• PC	No
• manual setting	No
product functions position detection	
product function	
• position detection with GPS	No
• pass on position data	No
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes

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Technical specifications (continued)

Article number product type designation	6GK7543-1MX00-0XE0 TIM 1531 IRC
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes
standards, specifications, approvals marine classification header	
Marine classification association Det Norske Veritas (DNV)	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	128.35 kg
• during manufacturing	18.7 kg
• during operation	109 kg
• after end of life	0.65 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



- Especially suitable for industrial applications where the device is to be mounted in the control cabinet

Selection and ordering data

	Article No.
SCALANCE WAM763-1 access points IWLAN access point, 1 radio, 2.4/5 GHz, IEEE 802.11ax (WiFi 6), 2 RSMA connectors, iFeatures support via CLP, 1201 Mbps (gross), 4x10/100/1000 Mbps RJ45 port, redundant 24 V DC, terminal block, IP30, -30...+60 °C, CLP slot, DI/DQ, terminal block, note country approvals! CERT ID: MSAX-W1-RJ-E2 operation outside USA/Israel scope of delivery: Manuals on DVD, English/German, 3x terminal block	**6GK5763-1AL00-7DA0**

Accessories

	Article No.
DIN rail mounting adapter Adapter for mounting on a 35 mm DIN rail according to EN 50 022, with fixing screws	**6GK5798-8MF00-0AA1**
SCALANCE CLP 2GB Removable data storage medium for simple device replacement in the event of a fault and storage of configuration data; can be used in SIMATIC NET products with CLP slot	**6GK1900-0UB00-0AA0**
SCALANCE CLP EEC 2GB Removable data storage medium for simple device replacement in the event of a fault and storage of configuration data; can be used in SIMATIC NET products with CLP slot	**6GK1900-0UQ00-0AA0**
SCALANCE CLP 2GB W700 AP iFeatures Removable data storage medium for simple device replacement in the event of a fault and storage of configuration data; can be used in SIMATIC NET products with CLP slot	**6GK5907-8UA00-0AA0**
SCALANCE CLP 2GB W700 client iFeatures Removable data storage medium for enabling iFeatures for SCALANCE W in client mode, enables easy device replacement in the event of a fault, as well as storage of configuration data or engineering and application data	**6GK5907-4UA00-0AA0**
IE connecting cable IE FC RJ45 plug 180/IE FC RJ45 plug 180 Pre-assembled flexible connecting cable with 2x IE FC RJ45 plug 180 4 x 2	
• 2 m	**6XV1878-5BH20**
• 3 m	**6XV1878-5BH30**
• 5 m	**6XV1878-5BH50**
• 10 m	**6XV1878-5BN10**
• 15 m	**6XV1878-5BN15**
• 20 m	**6XV1878-5BN20**
• 25 m	**6XV1878-5BN25**
IE FC standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 plug 4 x 2 and IE M12 plug PRO 4 x 2; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1878-2A**
IE FC TP flexible cable GP 4 x 2 TP installation cable CAT6A for connecting to IE FC RJ45 plug 4 x 2, AWG24; sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1878-2B**
IE TP train cable GP 4 x 2 CAT7 TP installation cable for railway applications, for connection to FC M12 plug PRO 4 x 2, railway-certified, 8-core, shielded; Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m;	**6XV1878-2T**
IE FC M12 plug PRO 4 x 2 RJ45 connector (10/100/1000 Mbps) with a rugged metal enclosure and FC connection system, for IE FC cable 4 x 2 (AWG24); 180° cable outlet	
• 1 unit	**6GK1901-1BB11-2AA0**
• 10 units	**6GK1901-1BB11-2AB0**
• 50 units	**6GK1901-1BB11-2AE0**

You will find an overview of our IWLAN antennas under:
https://www.siemens.com/iwlan-antenna

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Technical specifications

Article number	6GK5763-1AL00-7DA0
product type designation product description	WAM763-1 IWLAN Access Point
product brand name	SCALANCE
Technical Product Detail Page	https://i.siemens.com/1P6GK5763-1AL00-7DA0
suitability for use	www.siemens.com/iwlan
transfer rate	
transfer rate	
• with WLAN maximum	1 201 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s, 1 000 Mbit/s
interfaces	
number of electrical/optical connections for network components or terminal equipment maximum note	4
number of electrical/optical connections for gigabit Ethernet maximum	4
number of electrical connections	
• for network components or terminal equipment	4
• for power supply	1
• for redundant voltage supply	1
type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	5-pole terminal block
memory	
design of the removable storage	
• CLP	Yes
• CLP iFeatures	Yes
interfaces wireless	
number of radio cards permanently installed	2
transmission mode for multiple input multiple output (MIMO)	2x2
number of spatial streams	2
number of electrical connections for external antenna(s)	2
type of electrical connection for external antenna(s)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes
signal inputs/outputs	
number of digital inputs	1
number of digital outputs	1
type of electrical connection at the digital inputs/outputs	2-pole terminal block in each case
input voltage at digital input at DC	-30 ... +30 V
output voltage at digital output at DC maximum	24 V; 0,5 A
operational current of the signaling contacts at DC at 30 V maximum	0.008 A
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	redundant power supply, 24 V DC, 5-pole terminal block
consumed current	
• at DC at 24 V	0.55 A
• at DC at 24 V sleep mode maximum	0.013 A
power loss [W]	
• at DC at 24 V	13.2 W
• at DC at 24 V sleep mode maximum	0.3 W
supply voltage 1 rated value	24 V
• type of voltage 1 of the supply voltage	DC
supply voltage 2 rated value	24 V
• type of voltage 2 of the supply voltage	DC
ambient conditions	
ambient temperature	
• during operation	-30 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	90 %
protection class IP	IP30
design, dimensions and weights	
width	35 mm
height	157 mm
depth	137 mm
width of the enclosure without antenna	35 mm
height of the enclosure without antenna	152.5 mm
depth of the enclosure without antenna	137 mm
net weight	0.65 kg
fastening method	wall mounting, DIN rail, mounting rail S7-300, mounting rail S7-1500, with adapter: 90° installation on DIN rail
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	Yes
• 35 mm top hat DIN rail mounting	Yes
• wall mounting	Yes
radio frequencies	
operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals
product features, product functions, product components general	
product function Access Point Mode	Yes
product function client Mode	Yes
number of SSIDs	8
product function	
• iPCF Access Point	No
• iPCF-2 access point	Yes; iPCF-2 is not compatible with iPCF. See documentation for function description.
• iPCF client	No
• iPCF-2 client	Yes; iPCF-2 is not compatible with iPCF. See documentation for function description.
product function iPRP	Yes

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Technical specifications (continued)

Article number	6GK5763-1AL00-7DA0
product type designation product description	WAM763-1 IWLAN Access Point
product functions management, configuration, engineering	
number of manageable IP addresses in client	2
product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• WDS	No
protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function	
• PROFINET IO diagnosis	Yes
• SysLog	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
product functions VLAN	
product function	
• function VLAN with IWLAN	Yes
number of VLANs maximum	24
product functions DHCP	
product function	
• DHCP client	Yes
product functions redundancy	
protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
product function	
• redundancy procedure MSTP	Yes
product functions security	
product function	
• management security, ACL-IP based	No
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	Yes

Technical specifications (continued)

Article number	6GK5763-1AL00-7DA0
product type designation product description	WAM763-1 IWLAN Access Point
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• WPA3	Yes
• TKIP/AES	Yes
• RADIUS client	Yes
protocol is supported	
• SSH	Yes
key length	
• with SSL	4 096 bit
product functions time	
protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes
standards, specifications, approvals	
certificate of suitability	
• EC Declaration of Conformity	Yes
• CE marking	Yes
standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
• IEEE 802.11ac	Yes
• IEEE 802.11ax	Yes
• IEEE 802.11r	Yes
MTBF	26 a
• reference temperature	40 °C
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	390.86 kg
• during manufacturing	29.7 kg
• during operation	361 kg
• after end of life	0.16 kg
further information internet links	
• internet link to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• internet link to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• Internet link to website: WLAN country approval	https://www.siemens.com/wireless-approvals
• internet link to the website: IWLAN	https://www.siemens.com/iwlan
• internet link to website: Industrial communication	https://www.siemens.com/simatic-net
• internet link to web page: SiePortal	https://sieportal.siemens.com/
• internet link to website: Image database	https://www.automation.siemens.com/bilddb

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Technical specifications (continued)

Article number	6GK5763-1AL00-7DA0
product type designation	WAM763-1
product description	IWLAN Access Point
• internet link to website: CAx-Download-Manager	https://www.siemens.com/cax
• internet link to website: Industry Online Support	https://support.industry.siemens.com
	0.55 A

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Overview



Industrial WLAN client module according to IEEE 802.11ax (WiFi 6)

- Especially suitable for industrial applications where the device is to be mounted in the control cabinet

Selection and ordering data

	Article No.
SCALANCE WUM763-1 IWLAN client IWLAN client, 1 radio, 2.4/5 GHz, 2 R-SMA connectors, iFeatures support via CLP, IEEE 802.11ax (WiFi 6), 1201 Mbps (gross), 4x10/100/1000 Mbps RJ45 port, redundant 24 V DC, terminal block, IP30, -30...+60 °C, CLP slot, DI/DQ, terminal block, note country approvals! CERT ID: MSAX-W1-RJ-E2 operation outside USA/Israel scope of delivery: Manuals on DVD, English/German, 2x terminal block	
SCALANCE WUM763-1 • without digital input/ digital output (DI/DQ) • Country approvals for operation outside the USA/Israel[1)]	**6GK5763-1AL00-3AA0**
SCALANCE WUM763-1 • with digital input/ digital output (DI/DQ) • Country approvals for operation outside the USA/Israel[1)]	**6GK5763-1AL00-3DA0**

1) Please note country approvals under http://www.siemens.com/wireless-approvals

Accessories

	Article No.
DIN rail mounting adapter Adapter for mounting on a 35 mm DIN rail according to EN 50 022, with fixing screws	**6GK5798-8MF00-0AA1**
SCALANCE CLP 2GB Removable data storage medium for simple device replacement in the event of a fault and storage of configuration data; can be used in SIMATIC NET products with CLP slot	**6GK1900-0UB00-0AA0**
SCALANCE CLP EEC 2GB Removable data storage medium for simple device replacement in the event of a fault and storage of configuration data; can be used in SIMATIC NET products with CLP slot	**6GK1900-0UQ00-0AA0**
SCALANCE CLP 2GB W700 AP iFeatures Removable data storage medium for simple device replacement in the event of a fault and storage of configuration data; can be used in SIMATIC NET products with CLP slot	**6GK5907-8UA00-0AA0**
SCALANCE CLP 2GB W700 client iFeatures Removable data storage medium for enabling iFeatures for SCALANCE W in client mode, enables easy device replacement in the event of a fault, as well as storage of configuration data or engineering and application data	**6GK5907-4UA00-0AA0**
IE connecting cable IE FC RJ45 plug 180/IE FC RJ45 plug 180 Pre-assembled flexible connecting cable with 2x IE FC RJ45 plug 180 4 x 2	
• 2 m	**6XV1878-5BH20**
• 3 m	**6XV1878-5BH30**
• 5 m	**6XV1878-5BH50**
• 10 m	**6XV1878-5BN10**
• 15 m	**6XV1878-5BN15**
• 20 m	**6XV1878-5BN20**
• 25 m	**6XV1878-5BN25**
IE FC standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 plug 4 x 2 and IE M12 plug PRO 4 x 2; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1878-2A**
IE FC TP flexible cable GP 4 x 2 TP installation cable CAT6A for connecting to IE FC RJ45 plug 4 x 2, AWG24; sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1878-2B**
IE TP train cable GP 4 x 2 CAT7 TP installation cable for railway applications, for connection to FC M12 plug PRO 4 x 2, railway-certified, 8-core, shielded; Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m;	**6XV1878-2T**
IE FC M12 plug PRO 4 x 2 RJ45 connector (10/100/1000 Mbps) with a rugged metal enclosure and FC connection system, for IE FC cable 4 x 2 (AWG24); 180° cable outlet	
• 1 unit	**6GK1901-1BB11-2AA0**
• 10 units	**6GK1901-1BB11-2AB0**
• 50 units	**6GK1901-1BB11-2AE0**

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Accessories (continued)

You will find an overview of our IWLAN antennas under:
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Technical specifications

Article number	6GK5763-1AL00-3AA0	6GK5763-1AL00-3DA0
product type designation product description	WUM763-1 IWLAN client module	WUM763-1 IWLAN client module with DI/DO
product brand name	SCALANCE	SCALANCE
Technical Product Detail Page	https://i.siemens.com/1P6GK5763-1AL00-3AA0	https://i.siemens.com/1P6GK5763-1AL00-3DA0
suitability for use	www.siemens.com/iwlan	www.siemens.com/iwlan
transfer rate		
transfer rate		
• with WLAN maximum	1 201 Mbit/s	1 201 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s, 1 000 Mbit/s	10 Mbit/s, 100 Mbit/s, 1 000 Mbit/s
interfaces		
number of electrical/optical connections for network components or terminal equipment maximum note	4	4
number of electrical/optical connections for gigabit Ethernet maximum	4	4
number of electrical connections		
• for network components or terminal equipment	4	4
• for power supply	1	1
• for redundant voltage supply	1	1
type of electrical connection		
• for network components or terminal equipment	RJ45 socket	RJ45 socket
• for power supply	5-pole terminal block	5-pole terminal block
memory		
design of the removable storage		
• CLP	Yes	Yes
• CLP iFeatures	Yes	Yes
interfaces wireless		
number of radio cards permanently installed	2	2
transmission mode for multiple input multiple output (MIMO)	2x2	2x2
number of spatial streams	2	2
number of electrical connections for external antenna(s)	2	2
type of electrical connection for external antenna(s)	R-SMA (socket)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes	Yes
signal inputs/outputs		
number of digital inputs	0	1
number of digital outputs	0	1
type of electrical connection at the digital inputs/outputs		2-pole terminal block in each case
input voltage at digital input at DC		-30 ... +30 V
output voltage at digital output at DC maximum		24 V; 0,5 A
operational current of the signaling contacts at DC at 30 V maximum		0.008 A
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	redundant power supply, 24 V DC, 5-pole terminal block	redundant power supply, 24 V DC, 5-pole terminal block
consumed current		
• at DC at 24 V	0.55 A	0.55 A
• at DC at 24 V sleep mode maximum	0.013 A	0.013 A
power loss [W]		
• at DC at 24 V	13.2 W	13.2 W
• at DC at 24 V sleep mode maximum	0.3 W	0.3 W
supply voltage 1 rated value	24 V	24 V
• type of voltage 1 of the supply voltage	DC	DC

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Technical specifications (continued)

Article number	6GK5763-1AL00-3AA0	6GK5763-1AL00-3DA0
product type designation product description	WUM763-1 IWLAN client module	WUM763-1 IWLAN client module with DI/DO
supply voltage 2 rated value	24 V	24 V
• type of voltage 2 of the supply voltage	DC	DC
ambient conditions		
ambient temperature		
• during operation	-30 ... +60 °C	-30 ... +60 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	90 %	90 %
protection class IP	IP30	IP30
design, dimensions and weights		
width	35 mm	35 mm
height	157 mm	157 mm
depth	137 mm	137 mm
width of the enclosure without antenna	35 mm	35 mm
height of the enclosure without antenna	152.5 mm	152.5 mm
depth of the enclosure without antenna	137 mm	137 mm
net weight	0.65 kg	0.65 kg
fastening method	wall mounting, DIN rail, mounting rail S7-300, mounting rail S7-1500, with adapter: 90° installation on DIN rail	wall mounting, DIN rail, mounting rail S7-300, mounting rail S7-1500, with adapter: 90° installation on DIN rail
• S7-300 rail mounting	Yes	Yes
• S7-1500 rail mounting	Yes	Yes
• 35 mm top hat DIN rail mounting	Yes	Yes
• wall mounting	Yes	Yes
radio frequencies		
operating frequency		
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals	4.9 ... 5.8 GHz; depending on the country approvals
product features, product functions, product components general		
product function Access Point Mode	No	No
product function client Mode	Yes	Yes
number of SSIDs	1	1
product function		
• iPCF Access Point	No	No
• iPCF-2 access point	Yes; iPCF-2 is not compatible with iPCF. See documentation for function description.	Yes; iPCF-2 is not compatible with iPCF. See documentation for function description.
• iPCF client	No	No
• iPCF-2 client	Yes; iPCF-2 is not compatible with iPCF. See documentation for function description.	Yes; iPCF-2 is not compatible with iPCF. See documentation for function description.
product function iPRP	Yes	Yes
product functions management, configuration, engineering		
number of manageable IP addresses in client	2	2
product function		
• CLI	Yes	Yes
• web-based management	Yes	Yes
• MIB support	Yes	Yes
• TRAPs via email	Yes	Yes
• configuration with STEP 7	Yes	Yes
• configuration with STEP 7 in the TIA Portal	Yes	Yes
• WDS	No	No
protocol is supported		
• Address Resolution Protocol (ARP)	Yes	Yes
• ICMP	Yes	Yes

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Technical specifications (continued)

Article number	6GK5763-1AL00-3AA0	6GK5763-1AL00-3DA0
product type designation product description	WUM763-1 IWLAN client module	WUM763-1 IWLAN client module with DI/DO
• Telnet	Yes	Yes
• HTTP	Yes	Yes
• HTTPS	Yes	Yes
• TFTP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
identification & maintenance function		
• I&M0 - device-specific information	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
product functions diagnostics		
product function		
• PROFINET IO diagnosis	Yes	Yes
• SysLog	Yes	Yes
protocol is supported		
• SNMP v1	Yes	Yes
• SNMP v2	Yes	Yes
• SNMP v3	Yes	Yes
product functions VLAN		
product function		
• function VLAN with IWLAN	Yes	Yes
number of VLANs maximum	24	24
product functions DHCP		
product function		
• DHCP client	Yes	Yes
product functions redundancy		
protocol is supported		
• STP/RSTP	Yes	Yes
• MSTP	Yes	Yes
• RSTP	Yes	Yes
product function		
• redundancy procedure MSTP	Yes	Yes
product functions security		
product function		
• management security, ACL-IP based	No	No
• IEEE 802.1x (radius)	Yes	Yes
• NAT/NAPT	Yes	Yes
• access protection according to IEEE802.11i	Yes	Yes
• WPA/WPA2	Yes	Yes
• WPA3	Yes	Yes
• TKIP/AES	Yes	Yes
• RADIUS client	Yes	Yes
protocol is supported		
• SSH	Yes	Yes
key length		
• with SSL	4 096 bit	4 096 bit
product functions time		
protocol is supported		
• NTP	Yes	Yes
• SNTP	Yes	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes	Yes
standards, specifications, approvals		
certificate of suitability		
• EC Declaration of Conformity	Yes	Yes

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Technical specifications (continued)

Article number	6GK5763-1AL00-3AA0	6GK5763-1AL00-3DA0
product type designation product description	WUM763-1 IWLAN client module	WUM763-1 IWLAN client module with DI/DO
• CE marking	Yes	Yes
standard for wireless communication		
• IEEE 802.11a	Yes	Yes
• IEEE 802.11b	Yes	Yes
• IEEE 802.11e	Yes	Yes
• IEEE 802.11g	Yes	Yes
• IEEE 802.11h	Yes	Yes
• IEEE 802.11i	Yes	Yes
• IEEE 802.11n	Yes	Yes
• IEEE 802.11ac	Yes	Yes
• IEEE 802.11ax	Yes	Yes
• IEEE 802.11r	Yes	Yes
MTBF	26 a	26 a
• reference temperature	40 °C	40 °C
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	390.86 kg	391.129 kg
• during manufacturing	29.7 kg	29.7 kg
• during operation	361 kg	361 kg
• after end of life	0.16 kg	0.156 kg
further information internet links		
• internet link to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• internet link to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• Internet link to website: WLAN country approval	https://www.siemens.com/wireless-approvals	https://www.siemens.com/wireless-approvals
• internet link to the website: IWLAN	https://www.siemens.com/iwlan	https://www.siemens.com/iwlan
• internet link to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• internet link to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• internet link to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• internet link to website: CAx-Download-Manager	https://www.siemens.com/cax	https://www.siemens.com/cax
• internet link to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
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Overview



- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 Kbps
  - RS 232C, max. 115.2 Kbps
  - RS 422/RS 485, max. 19.2 Kbps
  - RS 422/RS 485, max. 115.2 Kbps
- Protocols supported
  - Freeport: User-parameterizable frame format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU master
  - Modbus RTU device
  - USS, implemented through instructions

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

Communications module SIPLUS S7-1500 CM PtP RS 232 BA (Extended temperature range and exposure to environmental substances) Basic communications module with 1 RS 232 interface, Freeport, 3964(R) and USS protocols, 9-pin D-sub connector, max. 19.2 Kbps	**6AG1540-1AD01-7AA0**
Communications module SIPLUS S7-1500 CM PtP RS 232 HF (Extended temperature range and exposure to environmental substances) High Feature communications module with 1 RS 232 interface, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin D-sub connector, max. 115.2 Kbps	**6AG1541-1AD01-7AB0**
Communications module SIPLUS S7-1500 CM PtP RS 422/485 BA (Extended temperature range and exposure to environmental substances) Basic communications module with 1 interface RS422/485, Freeport, 3964(R) and USS protocols, 15-pin D-sub socket, max. 19.2 Kbps	**6AG1540-1AB01-7AA0**
Communications module SIPLUS S7-1500 CM PtP RS 422/485 HF (Extended temperature range and exposure to environmental substances) High Feature communications module with 1 RS 422/485 interface, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin D-sub socket, max. 115.2 Kbps	**6AG1541-1AB01-7AB0**
Accessories	See SIMATIC S7-1500, CM PtP communications module

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Technical specifications

Article number	6AG1540-1AB01-7AA0	6AG1540-1AD01-7AA0	6AG1541-1AB01-7AB0	6AG1541-1AD01-7AB0
	SIPLUS S7-1500 CM PTP RS422/485 BA	SIPLUS S7-1500 CM PTP RS232 BA	SIPLUS S7-1500 CM PTP RS422/485 HF	SIPLUS S7-1500 CM PTP RS232 HF
General information				
Product type designation	CM PtP RS 422 / 485 BA	CM PtP RS 232 BA	CM PtP RS 422 / 485 HF	CM PtP RS 232 HF
Product function				
• I&M data	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0
• Fast startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Installation type/mounting				
Rail mounting	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail
Interface types				
RS 232				
• Transmission rate, max.		19.2 kbit/s		115.2 kbit/s
• Cable length, max.		15 m		15 m
• RS 232 auxiliary signals		RTS, CTS, DTR, DSR, RI, DCD		RTS, CTS, DTR, DSR, RI, DCD
RS 485				
• Transmission rate, max.	19.2 kbit/s		250 kbit/s	
• Cable length, max.	1 200 m		1 200 m	
RS 422				
• Transmission rate, max.	19.2 kbit/s		115.2 kbit/s	
• Cable length, max.	1 200 m		1 200 m	
• 4-wire full duplex connection	Yes		Yes	
• 4-wire multipoint connection	No		No	
Protocols				
Integrated protocols				
- Freeport				
- Telegram length, max.	1 kbyte	1 kbyte	4 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
- 3964 (R)				
- Telegram length, max.	1 kbyte	1 kbyte	4 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
- Modbus RTU master				
- Address area			1 to 247, extended 1 to 65535	1 to 247, extended 1 to 65535
- max. number of devices			32	1
- Modbus RTU device				
- Address area			1 to 247, extended 1 to 65535	1 to 247, extended 1 to 65535
Telegram buffer				
• Buffer memory for telegrams	2 kbyte	2 kbyte	8 kbyte	8 kbyte
• Number of telegrams which can be buffered	255	255	255	255
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	No	No	No	No
Diagnoses				
• Wire break	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1540-1AB01-7AA0 SIPLUS S7-1500 CM PTP RS422/485 BA	6AG1540-1AD01-7AA0 SIPLUS S7-1500 CM PTP RS232 BA	6AG1541-1AB01-7AB0 SIPLUS S7-1500 CM PTP RS422/485 HF	6AG1541-1AD01-7AB0 SIPLUS S7-1500 CM PTP RS232 HF
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• Receive RxD	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Transmit TxD	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
Potential separation				
between backplane bus and interface	Yes	Yes	Yes	Yes
Security				
signed firmware update	Yes	Yes		Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)		Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				

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Technical specifications (continued)

Article number	6AG1540-1AB01-7AA0	6AG1540-1AD01-7AA0	6AG1541-1AB01-7AB0	6AG1541-1AD01-7AB0
	SIPLUS S7-1500 CM PTP RS422/485 BA	SIPLUS S7-1500 CM PTP RS232 BA	SIPLUS S7-1500 CM PTP RS422/485 HF	SIPLUS S7-1500 CM PTP RS232 HF
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Decentralized operation				
to SIMATIC S7-300	Yes	Yes	Yes	Yes
to SIMATIC S7-400	Yes	Yes	Yes	Yes
to SIMATIC S7-1500	Yes	Yes	Yes	Yes
to standard PROFINET controller	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	127 mm	127 mm	127 mm	127 mm
Weights				
Weight, approx.	0.22 kg	0.22 kg	0.22 kg	0.22 kg

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Overview



DP-M	DP-S	FMS	PG/OP	S7	
●	●		●	●	

G_IK10_XX_10148

CM 1542-5

The CM 1542-5 communications module expands the SIMATIC S7-1500 Controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module can also be used to implement separate PROFIBUS lines, in other words, to control a number of different field devices via a number of PROFIBUS segments. The CM 1542-5 handles all communication tasks, thus reducing the CPU load.

Apart from classic PROFIBUS communication, the CM 1542-5 is also suitable for S7 communication. This makes it possible to establish communication between the S7-1500 controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP device with electrical interface for connecting a SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)
- Communications services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
  - Open user communication (SEND/RECEIVE) via FDL
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without programming device/engineering station
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Overview (continued)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

Communications module SIPLUS S7-1500 CM 1542-5 (Extended temperature range and exposure to environmental substances) Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS; S7 and PG/OP communication, time-of-day, synchronization, diagnostics	**6AG1542-5DX10-7XE0**
Accessories	See SIMATIC S7-1500, CM 1542-5 communications module

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Technical specifications

Article number	6AG1542-5DX10-7XE0	6AG1542-5FX10-7XE0
product type designation	CM 1542-5	CP 1542-5
product brand name	SIPLUS	SIPLUS
Technical Product Detail Page	https://i.siemens.com/1P6AG1542-5DX10-7XE0	https://i.siemens.com/1P6AG1542-5FX10-7XE0
transfer rate		
transfer rate		
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s	9.6 kbit/s ... 12 Mbit/s
interfaces		
number of interfaces according to Industrial Ethernet	0	0
number of electrical connections		
• at the 1st interface according to PROFIBUS	1	1
type of electrical connection		
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS485)	9-pin Sub-D socket (RS485)
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	DC
supply voltage 1 from backplane bus	15 V	15 V
relative symmetrical tolerance at DC		
• at 15 V	3 %	3 %
consumed current		
• from backplane bus at DC at 15 V typical	0.2 A	0.2 A
power loss [W]	3 W	3 W
ambient conditions		
ambient temperature		
• for vertical installation during operation	-40 ... +40 °C	-40 ... +40 °C
• for horizontally arranged busbars during operation	-40 ... +70 °C	-40 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
• note	Startup @ -25 °C	
installation altitude at height above sea level maximum	5 000 m	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity		
• with condensation according to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances		
• conformity according to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
resistance to chemically active substances		
• conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes	Yes
resistance to mechanically active substances		
• conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Protection of the type 1	Yes; Protection of the type 1

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Technical specifications (continued)

Article number	6AG1542-5DX10-7XE0	6AG1542-5FX10-7XE0
product type designation	CM 1542-5	CP 1542-5
type of test of the coating according to MIL-I-46058C	Yes; Coating discoloration during service life possible	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, class A	Yes; Conformal coating, class A
protection class IP	IP20	IP20
design, dimensions and weights		
module format	Compact module S7-1500 single width	Compact module S7-1500 single width
width	35 mm	35 mm
height	142 mm	142 mm
depth	129 mm	129 mm
net weight	0.4 kg	0.4 kg
fastening method		
• S7-1500 rail mounting	Yes	Yes
product features, product functions, product components general		
number of units		
• per CPU maximum	8	8
• note	depending on CPU type	depending on CPU type
performance data open communication		
number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	30	
data volume		
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte	
performance data PROFIBUS DP		
service as DP master		
• DPV1	Yes	Yes
number of DP devices		
• on DP master operable	125	32
data volume		
• of the address range of the inputs as DP master total	8 192 byte	2 048 byte
• of the address range of the outputs as DP master total	8 192 byte	2 048 byte
• of the address range of the inputs per DP device	244 byte	244 byte
• of the address range of the outputs per DP device	244 byte	244 byte
service as DP device		
• DPV0	Yes	Yes
• DPV1	Yes	Yes
data volume		
• of the address range of the inputs as DP device total	240 byte	240 byte
• of the address range of the outputs as DP device total	240 byte	240 byte
performance data S7 communication		
number of possible connections for S7 communication		
• maximum	48; depending on the system upper limit	16; depending on the system upper limit
performance data multi-protocol mode		
number of active connections with multi-protocol mode	48	16
performance data telecontrol		
protocol is supported		
• TCP/IP	No	No
product functions management, configuration, engineering		
configuration software		
• required	STEP 7 Professional V18 (TIA Portal) or higher	STEP 7 Professional V18 (TIA Portal) or higher
identification & maintenance function		
• I&M0 - device-specific information	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes
product functions diagnostics		
product function web-based diagnostics	Yes; via S7-1500 CPU	Yes; via S7-1500 CPU

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Technical specifications (continued)

Article number	6AG1542-5DX10-7XE0	6AG1542-5FX10-7XE0
product type designation	CM 1542-5	CP 1542-5
product functions time		
product function pass on time synchronization	Yes	Yes
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	115.54 kg	115.52 kg
• during manufacturing	21.26 kg	21.24 kg
• during operation	93.93 kg	93.93 kg
• after end of life	0.35 kg	0.35 kg
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●	●	●	●

G_IK10_XX_10353

The CP 1543-1 communications processor securely connects the SIMATIC S7-1500 PLC to Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols such as FTPS and SNMPv3, the communications processor protects individual S7-1500 stations or even entire automation cells against unauthorized access.

The CP can also be used for linking the S7-1500 station into an IPv6-based network. All functions are configured by means of STEP 7 Professional V12 (TIA Portal) or higher.

The CP 1543-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open user communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Access (read and write modes) to csv files stored on the memory card of the CPU via FTP(S)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Static IP routing with up to 1 Mbps via IPv4 to other CP 1543-1/CM 1542-1 units in an S7-1500 system, e.g. for web server access without real-time capability
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
  - Network authentication according to IEEE 802.1X using the EAP methods MD5, TLS, PEAP, TTLS, MSCHAPv2 or PWD

Overview (continued)

- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
  - Encrypted email communication via SMTPS (Port 587)
  - Secure open communication over TCP/IP
  - Connection to SINEMA Remote Connect via OpenVPN
- Integration of an S7-1500 into IPv6-based networks;
  An IPv6-compliant IP address can be used for the following communications services:
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing by program block
  - Email transfer with addressing by program block

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS NET CP 1543-1 communications processor (Extended temperature range and exposure to environmental substances) CP 1543-1 communications processor for the connection of SIMATIC S7-1500 to Industrial Ethernet; TCP/IP, ISO, UDP, with conformal coating -40 ... +70° C	**6AG1543-1AX10-7XE0**
Accessories	See SIMATIC S7-1500, CP 1543-1 communications processor

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Technical specifications

Article number product type designation	6AG1543-1AX10-7XE0 CP 1543-1
product brand name	SIPLUS
Technical Product Detail Page	https://i.siemens.com/1P6AG1543-1AX10-7XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	1
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	RJ45 port
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage 1 from backplane bus	15 V
relative symmetrical tolerance at DC	
• at 15 V	3 %
consumed current	
• from backplane bus at DC at 15 V typical	0.25 A
power loss [W]	3.75 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-40 ... +40 °C
• for horizontally arranged busbars during operation	-40 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
installation altitude at height above sea level maximum	5 000 m
ambient condition relating to ambient temperature - air pressure - installation altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
relative humidity	
• with condensation according to IEC 60068-2-38 maximum	100 %; RH including condensation/frost (no commissioning when condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. airborne diesel and oil droplets
resistance to biologically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (excluding fauna), Class 3B3 on request
• conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
resistance to chemically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray in accordance with EN 60068-2-52 (Severity 3). The supplied plug covers must remain in place on the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes
resistance to mechanically active substances	
• conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
• conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes
type of test of the coating according to MIL-I-46058C	Yes; Coating discoloration during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, class A
protection class IP	IP20
design, dimensions and weights	
module format	Compact module S7-1500 single width
width	35 mm
height	142 mm

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Technical specifications (continued)

Article number product type designation	6AG1543-1AX10-7XE0 CP 1543-1
depth	129 mm
net weight	0.26 kg
fastening method	
• S7-1500 rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	8
• note	depending on CPU type
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
number of Multicast stations	118
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	118; depending on the system upper limit
performance data multi-protocol mode	
number of active connections with multi-protocol mode	118
performance data IT functions	
number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
number of possible connections	
• as server by means of HTTP maximum	4
• as email client maximum	1
data volume as user data for email maximum	64 Kibyte
performance data telecontrol	
protocol is supported	
• TCP/IP	Yes
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V19 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes; via S7-1500 CPU
product functions routing	
service routing note	IP routing up to 1 Mbps
product function	
• static IP routing	Yes
• static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
protocol is supported	
• RIP v1	No

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Technical specifications (continued)

Article number product type designation	6AG1543-1AX10-7XE0 CP 1543-1
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
product functions security	
firewall version	stateful inspection
product function with VPN connection	IPSec
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1, SHA-256, SHA-384, SHA-512
number of possible connections with VPN connection	16
product function	
• IEEE 802.1x (radius)	Yes
• password protection for Web applications	No
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• blocking of communication via physical ports	No
• log file for unauthorized access	Yes
product functions time	
product function SICLOCK support	No
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	140.88 kg
• during manufacturing	21.24 kg
• during operation	119.29 kg
• after end of life	0.35 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



- Uniform, 40-pin front connector, suitable for SIMATIC S7-1500 I/O modules
- Versions for 25 mm wide or 35 mm wide modules
- With screw-type or push-in terminals
- Connectable core cross-sections: 0.25 $mm^2$to 1.5 mm^2 (AWG 24 to 16)
- Front connector for 35 mm modules to be ordered separately; front connector for 25 mm modules included in scope of supply of modules

Design

- 40 terminals, arranged in two rows, numbered consecutively from 1 to 40
- Direct assignment of terminal to LED and labeling simplifies wiring, commissioning, and troubleshooting
- Holders for four potential bridges for simple and flexible creation of potential groups;
  four units are supplied with the front connector (optionally available as spare parts in packs of 20)
- Integrated shielding concept for analog modules and technology modules;
  allows space-saving installation without tools and ensures high ruggedness and EMC stability;
  components supplied with analog modules
- Cable ties for mechanical fixing of the cable bundle and for strain relief;
  1 unit supplied with front connector

Selection and ordering data

Front connectors	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin for 25 mm wide modules and compact CPUs of the S7-1500, incl. cable tie	**6ES7592-1BM00-0XA0**
Accessories	
SIMATIC S7-1500, spare part jumper links For front connectors for 35 mm wide IO modules; can be used for all 24 V DC modules; 20 units per packing unit; Note: not suitable for 230 V, not suitable for analog modules	**6ES7592-3AA00-0AA0**

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Overview



With two cabling systems, SIMATIC TOP connect ensures efficient wiring of the input and output module of the SIMATIC S7-1500 (35 mm unit): Fully modular connection for fast and clearly arranged connecting to sensors and actuators in the field, and flexible connection for simple wiring inside the control cabinet.

With the TIA Selection Tool, you can select suitable system cabling for the individual I/O modules with a simple mouse click. Suitable components for the respective I/O module are always offered. These can be transferred to the order list and then ordered in the Industry Mall.

More information is available on the internet at

Design

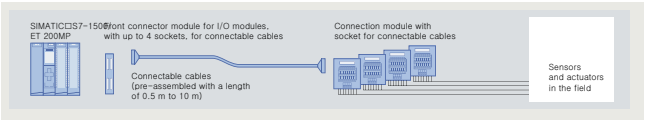
Two cabling variants are available for a wide range of control cabinet concepts:

Fully modular connection

The system consists of:

- Front connector module
- Connecting cable
- Connection modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is significantly reduced. Systematic connection of the SIMATIC system. The assembly work for the connecting cables is drastically reduced thanks to the use of pre-assembled cables sold by the meter.



SIMATIC TOP connect for S7-1500/ET 200MP, fully modular connection

Flexible connection

Flexible connection with front connectors is available with 20 (Pin1 – 20) or 40 wired single cores.

These are available in lengths from 2.5 m to 10.0 m.

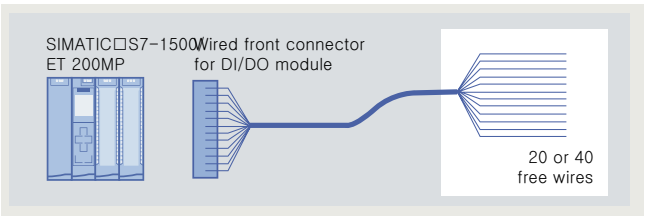
The single cores are available in different versions:

- Wire type H05V-K is used for industrial applications
- The UL/CSA-approved core is available for export to North America
- The halogen-free version is used where low smoke gas density in the event of fire is required, e.g. in building automation

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50% for assembly, since the single cores that have already been checked on the connector are fixed.

Thus no complex pre-assembly of up to two times 20 single cores per module is necessary.



SIMATIC TOP connect for S7-1500/ET 200MP, flexible connection

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Overview



The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-1500 or ET 200MP (35 mm design) consists of modified front connectors, called front connector modules, pre-assembled connecting cables of various lengths, and connection modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The connection modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

Benefits

- Front connector module, connecting cable and terminal module are easy to plug in
- Fast, low-cost wiring
- In the case of digital signals, the supply voltage can be connected to the front connector module or the connection module
- Reduction in wiring errors, clear control cabinet wiring
- Distribution of digital signals by byte or quadruple byte
- Each component can be replaced individually
- Use of pre-assembled cables possible

Design

Front connector module

Modified front connectors, called front connector modules, are available for connecting to the I/O modules (35 mm design). These are plugged into the I/O module to be wired instead of the front connector. The front connector modules are available in many different versions for digital I/O modules, analog I/O modules and for the 24 V, 2-ampère module. The connecting cables are plugged into these front connector modules.

Connecting cable

There are different versions of the connecting cable.

As a pre-assembled 16-pole or 50-pole round cable (shielded or unshielded) it is available in lengths up to 10 m.

When pre-assembled, there are one or two connectors in insulation displacement method (female ribbon connectors) at both ends of the cable.

The connecting cable connects the front connector module with the connection module.

As a pre-assembled round cable (unshielded) with a 40-pole plug on the side of the I/O module (64-channel) and a 50-pole plug for the connection to the connection module (4-byte version). The cable connectors are designed with the insulation displacement method.

Connection module

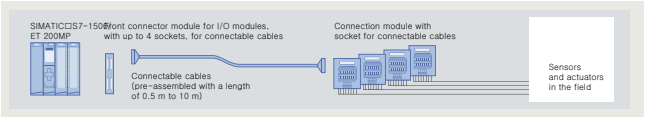
The system has both digital and analog connection modules for connecting the I/O signals. These are snapped onto the DIN rail. The connection modules with basic or signal functionality are available in 1-byte or 4-byte versions.

Connection modules are available for two different connection methods: with push-in or screw-type terminals. The potential can be fed in at the connection module or at the front connector module.

If other voltage or power levels are required in the field, the connection module for TPRo or TPOo output signals is used. For the TPRo connection module, relays are used for the implementation. For the TPOo connection module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC or 110 V AC input signals have to be transmitted to the PLC in the field, a connection module with relay TPRi is available that simply converts the 230/110 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay terminal module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency.



SIMATIC TOP connect for S7-1500/ET 200MP, fully modular connection

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Selection and ordering data

Front connector module for digital modules for the connection of 16-pole connecting cables	
Power supply via	
• Push-in	**6ES7921-5AH20-0AA0**
• Screw terminals	**6ES7921-5AB20-0AA0**
Front connector module for digital modules for the connection of 50-pole connecting cables	
Power supply via	
• Push-in	**6ES7921-5CH20-0AA0**
• Screw terminals	**6ES7921-5CB20-0AA0**
Front connector module for 2 A digital output modules for the connection of 16-pole connecting cables	
Power supply via	
• Push-in	**6ES7921-5AJ00-0AA0**
• Screw terminals	**6ES7921-5AD00-0AA0**
Front connector module for analog modules for the connection of 16-pole connecting cables	**6ES7921-5AK20-0AA0**
Front connector module for analog modules for the connection of 50-pole connecting cables	**6ES7921-5CK20-0AA0**

1) The terminal assignment of these front connector modules is unique and the dimensional drawings are shown in the Equipment Manual of SIMATIC TOP connect for S7-1500 and ET 200MP. The equipment manual is available as a download from Customer Support with the following ID: 95924607.

Technical specifications

Rated operating voltage	**24 V DC**
Max. permissible operating voltage	60 V DC
Max. permissible continuous current • per connector pin	1 A
Max. permissible total current	2 A/byte
Permissible ambient temperature	0 to +60 °C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Clearance and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2

Wiring rules for the front connector modules

SIMATIC TOP connect front connector module, connection for potential infeed

	Push-in	Screw terminals
	Modules up to 4 connections	
Connectable cable cross-sections		
• Solid conductors	No	
• Flexible cables with/without wire end ferrule	0.25 to 1.5 mm²	
Number of cables per connection	1 or a combination of 2 wires up to 1.5 mm² (total) in a common wire end ferrule	
Max. diameter of the cable insulation	3.1 mm	
Stripped length of the cables		
• Without insulating collar	6 mm	
• With insulating collar	-	
Wire end ferrules according to DIN 46228		
• Without insulating collar	Form A; 5 to 7 mm long	
• With insulating collar 0.25 to 1.0 mm²	-	
• With insulating collar 1.5 mm²	-	
Blade width of the screwdriver	3.5 mm (cylindrical design)	
Tightening torque for connecting the cables	-	0.4 Nm to 0.7 Nm

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Selection and ordering data

Connecting cables for SIMATIC S7-1500	
Pre-assembled round cable	
16-pin, 0.14 mm²	
Unshielded	
• 0.5 m	**6ES7923-0BA50-0CB0**
• 1.0 m	**6ES7923-0BB00-0CB0**
• 1.5 m	**6ES7923-0BB50-0CB0**
• 2.0 m	**6ES7923-0BC00-0CB0**
• 2.5 m	**6ES7923-0BC50-0CB0**
• 3.0 m	**6ES7923-0BD00-0CB0**
• 4.0 m	**6ES7923-0BE00-0CB0**
• 5.0 m	**6ES7923-0BF00-0CB0**
• 6.5 m	**6ES7923-0BG50-0CB0**
• 8.0 m	**6ES7923-0BJ00-0CB0**
• 10.0 m	**6ES7923-0CB00-0CB0**
Shielded	
• 1.0 m	**6ES7923-0BB00-0DB0**
• 2.0 m	**6ES7923-0BC00-0DB0**
• 2.5 m	**6ES7923-0BC50-0DB0**
• 3.0 m	**6ES7923-0BD00-0DB0**
• 4.0 m	**6ES7923-0BE00-0DB0**
• 5.0 m	**6ES7923-0BF00-0DB0**
• 6.5 m	**6ES7923-0BG50-0DB0**
• 8.0 m	**6ES7923-0BJ00-0DB0**
• 10.0 m	**6ES7923-0CB00-0DB0**
Version 4 x 16 to 1 x 50-pin, 0.14 mm²	
Unshielded	
• 0.5 m	**6ES7923-5BA50-0EB0**
• 1.0 m	**6ES7923-5BB00-0EB0**
• 1.5 m	**6ES7923-5BB50-0EB0**
• 2.0 m	**6ES7923-5BC00-0EB0**
• 2.5 m	**6ES7923-5BC50-0EB0**
• 3.0 m	**6ES7923-5BD00-0EB0**
• 4.0 m	**6ES7923-5BE00-0EB0**
• 5.0 m	**6ES7923-5BF00-0EB0**
• 6.5 m	**6ES7923-5BG50-0EB0**
• 8.0 m	**6ES7923-5BJ00-0EB0**
• 10.0 m	**6ES7923-5CB00-0EB0**
Connecting cables for S7-1500	
Pre-assembled round cable	
50-pin, 0.14 mm²	
Unshielded	
• 0.5 m	**6ES7923-5BA50-0CB0**
• 1.0 m	**6ES7923-5BB00-0CB0**
• 1.5 m	**6ES7923-5BB50-0CB0**
• 2.0 m	**6ES7923-5BC00-0CB0**
• 2.5 m	**6ES7923-5BC50-0CB0**
• 3.0 m	**6ES7923-5BD00-0CB0**
• 4.0 m	**6ES7923-5BE00-0CB0**
• 5.0 m	**6ES7923-5BF00-0CB0**
• 6.5 m	**6ES7923-5BG50-0CB0**
• 8.0 m	**6ES7923-5BJ00-0CB0**
• 10.0 m	**6ES7923-5CB00-0CB0**
Shielded	
• 1.0 m	**6ES7923-5BB00-0DB0**
• 2.0 m	**6ES7923-5BC00-0DB0**
• 2.5 m	**6ES7923-5BC50-0DB0**
• 3.0 m	**6ES7923-5BD00-0DB0**
• 4.0 m	**6ES7923-5BE00-0DB0**
• 5.0 m	**6ES7923-5BF00-0DB0**
• 6.5 m	**6ES7923-5BG50-0DB0**
• 8.0 m	**6ES7923-5BJ00-0DB0**
• 10.0 m	**6ES7923-5CB00-0DB0**
Version 1 x 40-pin to 1 x 50-pin, 0.14 mm²	
Unshielded	
• 1.0 m	**6ES7923-5BB00-0GB0**
• 2.0 m	**6ES7923-5BC00-0GB0**
• 2.5 m	**6ES7923-5BC50-0GB0**
• 3.0 m	**6ES7923-5BD00-0GB0**

Technical specifications

Technical specifications of connecting cable from SIMATIC S7 to connection module	
Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. total current	4 A/byte
Operating temperature	0 to +60 °C
Outer diameter of pre-assembled round cable in mm unshielded/shielded (16-pole)	Approx. 6.5/7.0

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Selection and ordering data

Connection modules

Connection module TP1	
For 1-wire connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0AA20-0BA0**
For 1-wire connection, for 50-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-2AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-2AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2AA20-0BA0**
• Push-in terminals, sourcing input, with LEDs	**6ES7924-2AK20-0BC0**
• Screw-type terminals, sourcing input, with LEDs	**6ES7924-2AK20-0BA0**
• Push-in terminals, mid-point conductor signal, with LEDs	**6ES7924-2AM20-0BC0**
• Screw-type terminals, mid-point conductor signal, with LEDs	**6ES7924-2AM20-0BA0**
Connection module TP3	
For 3-wire connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0CA20-0BA0**
• Push-in terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BC0**
• Screw-type terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BA0**
• Push-in terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BA0**
For 3-wire connection, for 50-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-2CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-2CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2CA20-0BA0**
Connection module TPRo	
Relay module for 8 outputs, relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BD20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BD20-0BA0**
Connection module TPRi	
Relay module for 8 inputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**
Connection module TPRi	
Relay module for 8 inputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
Connection module TPOo	
Optocoupler module for 8 outputs (max. 24 V DC/4 A)	
• Push-in terminals with LEDs	**6ES7924-0BF20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BF20-0BA0**
Connection module for digital output modules 2 A	
Connection module TP2	
• Push-in terminals without LEDs	**6ES7924-0BB20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0BB20-0AA0**
Connection module for analog modules	
TPA connection module, 16-pin	
• Push-in terminals without LEDs	**6ES7924-0CC20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CC20-0AA0**
TPA connection module, 50-pin	
• Push-in terminals without LEDs	**6ES7924-2CC20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2CC20-0AA0**
Accessories	
Labeling strip	
Labels for connection modules (6ES7924-... 20-0..0), PU = 340 units	**3RT2900-1SB20**
Shield plate	
For connection module 8 bits; Pck. unit = 4 units (for 15-pin connecting cable connection)	**6ES7928-1AA20-4AA0**
For connection module analog 32 bits; Pck. unit = 4 units (for 15-pin connecting cable connection)	**6ES7928-1BA20-4AA0**
Shield connection clamp	
For shield plate at SIMATIC end PU = 10 units	**6ES7590-5BA00-0AA0**
For shield plate at field end, 2 x 2 to 6 mm	**6ES7390-5AB00-0AA0**
For shield plate at field end, 3 to 8 mm	**6ES7390-5BA00-0AA0**
For shield plate at field end, 4 to 13 mm	**6ES7390-5CA00-0AA0**
Relay	
For TPRO 24 V DC, coil voltage 24 V DC, output 230 V AC, Pck. unit = 4 units	**6ES7928-3AA20-4AA0**
For TPRI 110 V AC, coil voltage 110 V AC, Pck. unit = 4 units	**6ES7928-3EA20-4AA0**
For TPRI 230 V AC, coil voltage 230 V AC, Pck. unit = 4 units	**6ES7928-3BA20-4AA0**
Solid-state relay for TPRO	
Excitation voltage 24 V DC, output 230 V AC, Pck. unit = 4 units	**6ES7928-3CA20-4AA0**
Excitation voltage 24 V DC, output 60 V DC, Pck. unit = 4 units	**6ES7928-3DA20-4AA0**
Housing cover for connection module	
TP1 8 bits, Pck. unit = 4 units	**6ES7928-5AA20-4AA0**
TP2 / TP3 / TPA 8 bits, Pck. unit = 4 units	**6ES7928-5BA20-4AA0**
TP3 32 bits, Pck. unit = 4 units	**6ES7928-5CA20-4AA0**
TP1 32 bits / TP3 switch / TPRO 8 bits, Pck. unit = 4 units	**6ES7928-5DA20-4AA0**
TPA 32 bits / TP3 fuse / TPRI / TPOO 8 bits, Pck. unit = 4 units	**6ES7928-5EA20-4AA0**
Fuses	
0.6 A, Pck. unit = 10 units	**6ES7928-6AA20-0AA0**

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Overview



Flexible connection of the cabling system consists of a S7-1500 front connector which has the 20 or 40 single cores already in place and which directly connects the I/O modules (35 mm design) with the sensors and actuators inside the control cabinet. With a cross-section of 0.5 square mm, the single wires are also suitable for higher currents and are available in different lengths and versions: as H05V-K cores (PVC insulation), H05Z-K (halogen-free insulation) or with UL/CSA certified cores. The halogen-free version has a low smoke gas density in the event of a fire and is thus particularly well suited for use in buildings.

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Selection and ordering data

Front connector with single cores for 32 channels (pins 1-40)	
Core type H05V-K (0.5 mm² with screw connection)	
• 2.5 m	**6ES7922-5BC50-0AC0**
• 3.2 m	**6ES7922-5BD20-0AC0**
• 5.0 m	**6ES7922-5BF00-0AC0**
• 6.5 m	**6ES7922-5BG50-0AC0**
• 8.0 m	**6ES7922-5BJ00-0AC0**
• 10.0 m	**6ES7922-5CB00-0AC0**
Core type H05Z-K, halogen-free (0.5 mm² with screw connection)	
• 2.5 m	**6ES7922-5BC50-0HC0**
• 3.2 m	**6ES7922-5BD20-0HC0**
• 5.0 m	**6ES7922-5BF00-0HC0**
• 6.5 m	**6ES7922-5BG50-0HC0**
• 8.0 m	**6ES7922-5BJ00-0HC0**
• 10.0 m	**6ES7922-5CB00-0HC0**
Core type UL/CSA-certified (0.5 mm² with screw connection)	
• 3.2 m	**6ES7922-5BD20-0UC0**
• 5.0 m	**6ES7922-5BF00-0UC0**
• 6.5 m	**6ES7922-5BG50-0UC0**
Front connector with single cores for 16 channels (pins 1-20)	
Core type H05V-K (0.5 mm² with screw connection)	
• 2.5 m	**6ES7922-5BC50-0AB0**
• 3.2 m	**6ES7922-5BD20-0AB0**
• 5.0 m	**6ES7922-5BF00-0AB0**
• 6.5 m	**6ES7922-5BG50-0AB0**
• 8.0 m	**6ES7922-5BJ00-0AB0**
• 10.0 m	**6ES7922-5CB00-0AB0**
Core type H05Z-K, halogen-free (0.5 mm² with screw connection)	
• 2.5 m	**6ES7922-5BC50-0HB0**
• 3.2 m	**6ES7922-5BD20-0HB0**
• 5.0 m	**6ES7922-5BF00-0HB0**
• 6.5 m	**6ES7922-5BG50-0HB0**
• 8.0 m	**6ES7922-5BJ00-0HB0**
• 10.0 m	**6ES7922-5CB00-0HB0**
Core type UL/CSA-certified (0.5 mm² with screw connection)	
• 3.2 m	**6ES7922-5BD20-0UB0**
• 5.0 m	**6ES7922-5BF00-0UB0**
• 6.5 m	**6ES7922-5BG50-0UB0**

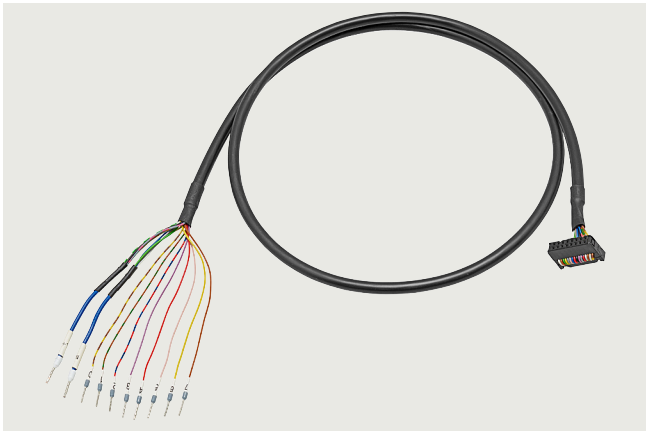
Technical specifications

Front connector with single cores for 16 channels (pins 1-20)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	20
Core cross-section	0.5 mm²; Cu
Bundle diameter in mm	approx. 15
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw contacts

Front connector with single cores for 32 channels (pins 1-40)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	40
Core cross-section	0.5 mm²; Cu
Bundle diameter in mm	approx. 17
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)
Assembly	Screw contacts

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Overview



SIMATIC TOP connect universal connecting cable

The wiring of the

- SIMATIC S7-1500 IO (25 mm)
- SIMATIC ET 200SP
- SIMATIC S7-1200
- LOGO!

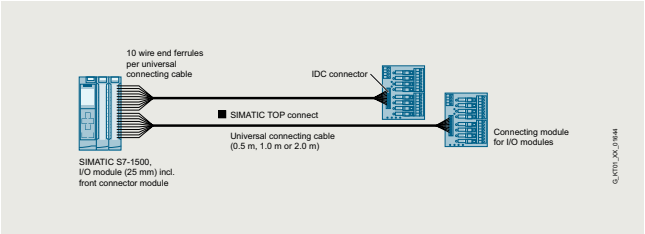
with the sensors/actuators is a significant factor with respect to time/cost overhead during configuration, control cabinet design, procurement and ease of servicing. The SIMATIC TOP connect system cabling makes connection easy, fast and secure.

Design

The unshielded universal connection cable is offered for a wide range of control cabinet concepts.

It comprises:

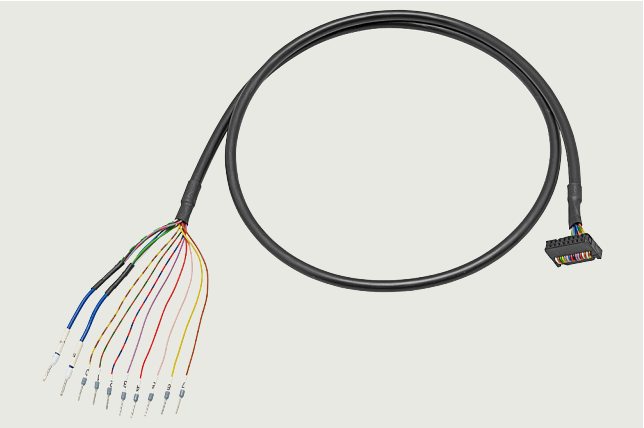
- 16-pin round cable with a core cross-section of 0.14 mm^2, pre-assembled with wire end ferrules for connection to the controller:
  - Labeled with "0" ... "7" for the control inputs/outputs
  - Labeled with "M" for mass
  - Labeled with "L+" for 24 V DC potential
- 16-pin ID (insulation displacement) connector for connection to the SIMATIC TOP connect connection modules for 8 I/Os:
  - 3-wire connection using the appropriate connection module for quick, error-free wiring
  - Galvanic isolation and adaptation using a coupling relay for easy implementation of potential groups in the system
  - High output current (up to 4 A), even for higher switching frequencies, using an optocoupler module (overload and short-circuit proof)
  - Implementation of isolating terminals using switch modules enabling individual signals to be measured
  - Channel-wise protection of I/Os using a fuse module with a thermal fuse



SIMATIC TOP connect universal connection cable

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Overview



SIMATIC TOP connect universal connecting cable

The universal connecting cable constitutes the link between the standard connection of the SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 or LOGO! and the SIMATIC TOP connect terminal module. It transmits 8 signals and the supply voltage. The connecting cable is available in lengths of 0.5 m / 1.0 m / 2.0 m. the maximum technically feasible length is 30 m.

Selection and ordering data

Designation	Article No.
Universal connecting cables for SIMATIC S7-1500 IO (25 mm), SIMATIC ET 200SP, SIMATIC S7-1200 and LOGO!	
16 x 0.14 mm² unshielded	
• 0.5 m	**6ES7923-0BA50-0FB0**
• 1.0 m	**6ES7923-0BB00-0FB0**
• 2.0 m	**6ES7923-0BC00-0FB0**

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Overview

The connection modules are used instead of conventional terminal blocks and act as the interface between the PLC and signals from the field. All digital modules with 8 I/Os can be used.

Selection and ordering data

TP1 connection module	
For 1-conductor connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0AA20-0BA0**
TP3 connection module	
For 3-conductor connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0CA20-0BA0**
• Push-in terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BC0**
• Screw-type terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BA0**
• Push-in terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and fuse per channel	**6ES7924-0CL20-0BA0**
TPRo connection module	
Relay module for 8 outputs, relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BD20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BD20-0BA0**
TPRi connection module	
Relay module for 8 inputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
TPRi connection module	
Relay module for 8 inputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**
TPOo connection module	
Optocoupler module for 8 outputs (max. 24 V DC/4 A)	
• Push-in terminals with LEDs	**6ES7924-0BF20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BF20-0BA0**

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Overview



Fail-safe digital input module:
F-DI 16x24VDC PROFISAFE
Important features:

- 16-channel fail-safe digital input module for ET 200MP/S7-1500
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 4 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

Selection and ordering data

F-digital input module	
SIMATIC S7-1500, F-digital input module F-DI 16x 24 V DC PROFIsafe; 35 mm width; up to PLe (ISO 13849-1)/ SIL 3 (IEC 61508)	**6ES7526-1BH00-0AB0**
Accessories	
SIMATIC DP, spare part 5 e-coding elements type F For ET 200MP modules F-DI, F-AI, F-DQ; 5 units per packing unit	**6ES7592-6EF00-1AA0**
Front connectors	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, labeling sheets For 35 mm width S7-1500 modules, color: yellow, material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2CX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Front door for F-I/O modules	
SIMATIC S7-1500, spare part front door for F-IO modules Consisting of: * front door (unlasered), * labeling strips (front, yellow for F-modules), * cabling diagram 5 units per packing unit	**6ES7528-0AA10-7AA0**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

S7 Distributed Safety V5.4 SP5 Update 2 programming tool **Task:** Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP **Requirement:** Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, floating license for 1 user, engineering software, software and documentation on DVD Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F	**6ES7833-1FC02-0YA5**
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, floating license for 1 user, software, documentation and license key for downloading[1)] Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FC02-0YH5**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7526-1BH00-0AB0 ET 200MP, F-DI 16X24VDC
General information	
Product type designation	F-DI 16x24VDC
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 with HSP 0086
Operating mode	
• DI	Yes
• MSI	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Max. 100 mA when mounted vertically
Digital inputs	
Number of digital inputs	16
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- Parameterizable	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	No
• short-circuit	Yes
• Group error	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm

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Technical specifications (continued)

Article number	6ES7526-1BH00-0AB0 ET 200MP, F-DI 16X24VDC
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	280 g

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Overview



Digital fail-safe output module:
F-DQ 8x24VDC 2A PPM PROFISAFE
Important features:

- 8-channel digital fail-safe output module for ET 200MP/S7-1500
- Fail-safe 2-channel activation (parameterizable PM/PP switching) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The module supports PROFIsafe in both PROFIBUS and PROFINET configurations.
- Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

Selection and ordering data

F-digital output module	
SIMATIC S7-1500, F-digital output module F-DQ 8x 24 V DC 2 A PPM PROFIsafe; 35 mm width; up to PLe (ISO 13849-1)/ SIL3 (IEC 61508)	**6ES7526-2BF00-0AB0**
Accessories	
SIMATIC DP, spare part 5 e-coding elements type F For ET 200MP modules F-DI, F-AI, F-DQ; 5 units per packing unit	**6ES7592-6EF00-1AA0**
Front connectors	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: yellow, material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2CX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Front door for F-I/O modules	
SIMATIC S7-1500, spare part front door for F-IO modules Consisting of: * front door (unlasered), * labeling strips (front, yellow for F-modules), * cabling diagram 5 units per packing unit	**6ES7528-0AA10-7AA0**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**

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Selection and ordering data (continued)

S7 Distributed Safety V5.4 SP5 Update 2 programming tool **Task:** Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP **Requirement:** Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, floating license for 1 user, engineering software, software and documentation on DVD Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F	**6ES7833-1FC02-0YA5**
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, floating license for 1 user, software, documentation and license key for downloading Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FC02-0YH5**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7526-2BF00-0AB0 ET 200MP, F-DQ 8x24VDC 2A PPM
General information	
Product type designation	F-DQ 8x24VDC/2A PPM
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 with HSP 0086
Operating mode	
• DQ	Yes
• MSO	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital outputs	
Number of digital outputs	8
Current-sinking	Yes
Current-sourcing	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	PM-switching: -24 V + (-47 V), PP-switching: -24 V
Controlling a digital input	Yes; digital output, according to IEC 61131-2, type 2
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	2 000 Ω
Output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA; Current-sourcing, or current sourcing and sinking switches individually, current sinking: max. 1 mA
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
Total current of the outputs (per module)	
- horizontal installation	
- up to 40 °C, max.	16 A
- up to 60 °C, max.	8 A
- vertical installation	
- up to 40 °C, max.	8 A
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED

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Technical specifications (continued)

Article number	6ES7526-2BF00-0AB0 ET 200MP, F-DQ 8x24VDC 2A PPM
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g

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Overview



Analog fail-safe input module:
F-AI 8xI 0(4)..20 mA
Important features:

- 8-channel analog fail-safe input module for ET 200MP/S7-1500
- Max. achievable safety classes: SIL3 (acc. to IEC 61508) and PLe (acc. to ISO 13849-1)
- Measurement type current, can be set for each channel:
  - 0 - 20 mA
  - 4 - 20 mA
- Interference frequency suppression: 50/60 Hz
- 8 analog inputs can be used as:
  - 8 channels - 1 of 1 (SIL3/Cat.3/PLd) or
  - Up to 4 channels - 1 of 2 (SIL3/Cat.4/PLe)
- Galvanic isolation:
  - To the backplane bus
  - Analog inputs in 2 groups of 4 channels
  - Between channels and power supply
- Resolution 16-bit including sign
- External encoder supply possible
- Internal short-circuit-proof encoder supply per channel
- Channel-wide and module-wide passivation
- HART communication
- Module width 35 mm
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version

Overview (continued)

- Optional labeling accessories
  - Labeling sheets, yellow
  - The module supports PROFIsafe in both PROFIBUS and PROFINET configurations.
  - Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

Selection and ordering data

F-analog input module	
SIMATIC S7-1500, F-analog input module F-AI 8xI 0(4)..20 mA PROFIsafe, 35 mm, width; up to PLe (ISO 13849-1)/ SIL 3 (IEC 61508)	**6ES7536-1MF00-0AB0**
Accessories	
SIMATIC DP, spare part 5 e-coding elements type F For ET 200MP modules F-DI, F-AI, F-DQ; 5 units per packing unit	**6ES7592-6EF00-1AA0**
Front connectors Incl. four potential bridges, cable ties and individual labeling strips, 40-pin	
SIMATIC S7-1500, front connector screw-type connection system 40-pin for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: yellow, material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2CX00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Front door for F-I/O modules	
SIMATIC S7-1500, spare part front door for F-IO modules Consisting of: * front door (unlasered), * labeling strips (front, yellow for F-modules) * Cabling diagram 5 units per packing unit	**6ES7528-0AA10-7AA0**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	

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Selection and ordering data (continued)

SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool **Task:** Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP **Requirement:** Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, floating license for 1 user, engineering software, software and documentation on DVD Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F	**6ES7833-1FC02-0YA5**
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, floating license for 1 user, software, documentation and license key for downloading Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FC02-0YH5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7536-1MF00-0AB0 ET 200MP, F-AI 8xI 0(4)..20mA
General information	
Product type designation	F-AI 8xI 0(4) ... 20 mA
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V18 with HSP0394 (FW V1.0) / V19 with HSP0451 (FW V2.0)
Operating mode	
• MSI	Yes; firmware V2.0 or higher
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
Analog inputs	
Number of analog inputs	8
permissible input current for current input (destruction limit), max.	35 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	1 000 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	20 / 16,667
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
Smoothing of measured values	
• Number of smoothing levels	7
• Parameterizable	Yes
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	650 Ω
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.05 %; without HART communication
Influence of a HART signal modulated on the input signal in relation to input range	
• error occurred at interference frequency suppression: 60 Hz	0.12 %
• error occurred at interference frequency suppression: 50 Hz	0.12 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode voltage, max.	60 V DC/30 V AC
• Common mode interference, min.	70 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• Overflow/Underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED

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Technical specifications (continued)

Article number	6ES7536-1MF00-0AB0 ET 200MP, F-AI 8xI 0(4)..20mA
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
Potential separation	
Potential separation analog inputs	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	290 g

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Overview



SIPLUS digital fail-safe input module:
F-DI 16x24 V DC
Important properties:

- 16-channel fail-safe digital input module for ET 200MP/S7-1500
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integrated discrepancy evaluation for 2-out-of-2 signals
- 4 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage, and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS F-digital input module 16 inputs, 24 V DC, PROFISAFE	**6AG1526-1BH00-2AB0**
Accessories	
Coding elements E-coding element type F for SIPLUS ET 200MP modules F-DI/F-DQ; 5 units, spare part	**6AG1592-6EF00-2AA0**
SIPLUS S7-1500 U connector Spare part for connecting I/O modules; self-assembling backplane bus; 5 pieces per packaging unit; with conformal coating, -40...+70 °C	**6AG1590-0AA00-7AA0**
Other accessories	See SIMATIC S7-1500 F-digital input modules

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Technical specifications

Article number	6AG1526-1BH00-2AB0 SIPLUS S7-1500 F-DI 16x24VDC
General information	
Product type designation	F-DI 16x24VDC
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Operating mode	
• DI	Yes
• MSI	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Max. 100 mA when mounted vertically
Digital inputs	
Number of digital inputs	16
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	No
• short-circuit	Yes
• Group error	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax
Altitude during operation relating to sea level	

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Technical specifications (continued)

Article number	6AG1526-1BH00-2AB0 SIPLUS S7-1500 F-DI 16x24VDC
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	280 g

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Overview



SIPLUS digital fail-safe output module:
F-DQ 8x24 V DC 2 A PPM

Important properties:

- 8-channel digital fail-safe output module for ET 200MP/S7-1500
- Fail-safe 2-channel activation (parameterizable PM/PP switching) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage, and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The module supports PROFIsafe in both PROFIBUS and PROFINET configurations.
- Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS F-digital output module 8 outputs, 24 V DC, 2 A, PROFISAFE, switching to sourcing/sinking output	**6AG1526-2BF00-2AB0**
Accessories	
Coding elements E-coding element type F for SIPLUS ET 200MP modules F-DI/F-DQ; 5 units, spare part	**6AG1592-6EF00-2AA0**
SIPLUS S7-1500 U connector Spare part for connecting I/O modules; self-assembling backplane bus; 5 pieces per packaging unit; with conformal coating, -40...+70 °C	**6AG1590-0AA00-7AA0**
Other accessories	See SIMATIC S7-1500, F-digital output modules

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Technical specifications

Article number	6AG1526-2BF00-2AB0 SIPLUS S7-1500 F-DQ 8x24VDC/2A
General information	
Product type designation	F-DQ 8x24VDC/2A PPM
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Operating mode	
• DQ	Yes
• MSO	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital outputs	
Number of digital outputs	8
Current-sinking	Yes
Current-sourcing	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	PM-switching: -24 V + (-47 V), PP-switching: -24 V
Controlling a digital input	Yes; digital output, according to IEC 61131-2, type 2
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	2 000 Ω
Output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA; Current-sourcing, or current sourcing and sinking switches individually, current sinking: max. 1 mA
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
Total current of the outputs (per module)	
- horizontal installation	
- up to 40 °C, max.	16 A
- up to 60 °C, max.	8 A
- vertical installation	
- up to 40 °C, max.	8 A
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED

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Technical specifications (continued)

Article number	6AG1526-2BF00-2AB0 SIPLUS S7-1500 F-DQ 8x24VDC/2A
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm

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Technical specifications (continued)

Article number	6AG1526-2BF00-2AB0 SIPLUS S7-1500 F-DQ 8x24VDC/2A
Weights	
Weight, approx.	300 g

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Overview



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

Selection and ordering data

	Article No.
SIMATIC PM 1507 Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 (with Ex approval) Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A	**6EP1332-4BA00-8AA0**
SIMATIC PM 1507 Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	**6EP1333-4BA00**
SIMATIC PM 1507 (with Ex approval) Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	**6EP1333-4BA00-8AA0**

Accessories

	Article No.
Power plug With coding element for power supply module; spare part, 10 units per packing unit	**6ES7590-8AA00-0AA0**
DIN rail adapter For adapting S7-1500 mounting rails on low or flat DIN rails, as pre-assembled in control cabinets and terminal boxes, for example. An adapter must be placed every 25 cm. Including mounting hardware. 10 units per packing unit	**6ES7590-6AA00-0AA0**

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Technical specifications

Article number	6EP1332-4BA00	6EP1332-4BA00-8AA0	6EP1333-4BA00	6EP1333-4BA00-8AA0
product brand name	SIMATIC	SIMATIC	SIMATIC	SIMATIC
type of current supply	24 V/3 A	24 V/3 A	24 V/8 A	24 V/8 A
General information				
Technical Product Detail Page	https://i.siemens.com/1P6EP1332-4BA00	https://i.siemens.com/1P6EP1332-4BA00-8A-A0	https://i.siemens.com/1P6EP1333-4BA00	https://i.siemens.com/1P6EP1333-4BA00-8A-A0
input				
type of the power supply network	1-phase AC	1-phase AC	1-phase AC	1-phase AC
supply voltage at AC	Automatic range selection	Automatic range selection	Automatic range selection	Automatic range selection
supply voltage	120 V/230 V	120 V/230 V	120 V/230 V	120 V/230 V
input voltage 1 at AC	85 ... 132 V	85 ... 132 V	85 ... 132 V	85 ... 132 V
input voltage 2 at AC	170 ... 264 V	170 ... 264 V	170 ... 264 V	170 ... 264 V
wide range input	No	No	No	No
overvoltage overload capability	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms
buffering time for rated value of the output current in the event of power failure minimum	20 ms	20 ms	20 ms	20 ms
operating condition of the mains buffering	at Vin = 93/187 V	at Vin = 93/187 V	at Vin = 93/187 V	at Vin = 93/187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	45 ... 65 Hz	45 ... 65 Hz	45 ... 65 Hz	45 ... 65 Hz
input current				
• at rated input voltage 120 V	1.4 A	1.4 A	3.7 A	3.7 A
• at rated input voltage 230 V	0.8 A	0.8 A	1.7 A	1.7 A
current limitation of inrush current at 25 °C maximum	23 A	23 A	62 A	62 A
duration of inrush current limiting at 25 °C				
• maximum	3 ms	3 ms	3 ms	3 ms
I2t value maximum	1.3 $A^2 \cdot s$	1.3 $A^2 \cdot s$	12 $A^2 \cdot s$	12 $A^2 \cdot s$
fuse protection type	T 3,15 A/250 V (not accessible)	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
fuse protection type in the feeder	Recommended miniature circuit breaker: 10 A characteristic B or 6 A characteristic C	Recommended miniature circuit breaker: 10 A characteristic B or 6 A characteristic C	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C
output				
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	24 V	24 V	24 V	24 V
output voltage				
• at output 1 at DC rated value	24 V	24 V	24 V	24 V
	24 V	24 V	24 V	24 V
output voltage adjustable	No	No	No	No
relative overall tolerance of the voltage	1 %	1 %	1 %	1 %
relative control precision of the output voltage				
• on slow fluctuation of input voltage	0.1 %	0.1 %	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.1 %	0.1 %	0.1 %	0.1 %
residual ripple				
• maximum	50 mV	50 mV	50 mV	50 mV
voltage peak				
• maximum	150 mV	150 mV	150 mV	150 mV
display version for normal operation	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by
behavior of the output voltage when switching on	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)
response delay maximum	1.5 s	1.5 s	1.5 s	1.5 s
voltage increase time of the output voltage				
• typical	10 ms	10 ms	10 ms	10 ms
output current				

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Technical specifications (continued)

Article number	6EP1332-4BA00	6EP1332-4BA00-8AA0	6EP1333-4BA00	6EP1333-4BA00-8AA0
product brand name	SIMATIC	SIMATIC	SIMATIC	SIMATIC
type of current supply	24 V/3 A	24 V/3 A	24 V/8 A	24 V/8 A
• rated value	3 A	3 A	8 A	8 A
• rated range	0 ... 3 A	0 ... 3 A	0 ... 8 A	0 ... 8 A
	2.6 ... 4.9 A	2.6 ... 4.9 A	5.1 ... 9.9 A	5.1 ... 9.9 A
supplied active power typical	72 W	72 W	192 W	192 W
short-term overload current				
• on short-circuiting during the start-up typical	12 A	12 A	35 A	35 A
• at short-circuit during operation typical	12 A	12 A	35 A	35 A
duration of overloading capability for excess current				
• on short-circuiting during the start-up	70 ms	70 ms	70 ms	70 ms
• at short-circuit during operation	70 ms	70 ms	70 ms	70 ms
bridging of equipment	Yes	Yes	Yes	Yes
number of parallel-switched equipment resources	2	2	2	2
efficiency				
efficiency in percent	87 %	87 %	90 %	90 %
power loss [W]				
• at rated output voltage for rated value of the output current typical	11 W	11 W	21 W	21 W
closed-loop control				
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.1 %	0.1 %	0.1 %	0.1 %
relative control precision of the output voltage load step of resistive load 50/100/50 % typical	1 %	1 %	2 %	2 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	3 %	3 %	3 %	3 %
setting time				
• load step 10 to 90% typical	5 ms	5 ms	5 ms	5 ms
• load step 90 to 10% typical	5 ms	5 ms	5 ms	5 ms
• maximum	5 ms	5 ms	5 ms	5 ms
protection and monitoring				
design of the overvoltage protection	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V
property of the output short-circuit proof	Yes	Yes	Yes	Yes
design of short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
response value current limitation	3.15 ... 3.6 A	3.15 ... 3.6 A	8.4 ... 9.6 A	8.4 ... 9.6 A
• typical	3.4 A	3.4 A	9 A	9 A
safety				
galvanic isolation between input and output	Yes	Yes	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class I	Class I	Class I	Class I
leakage current				
• maximum	3.5 mA	3.5 mA	3.5 mA	3.5 mA
• typical	0.4 mA	0.4 mA	1.3 mA	1.3 mA
protection class IP	IP20	IP20	IP20	IP20
EMC				
standard				
• for emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
• for mains harmonics limitation	EN 61000-3-2	EN 61000-3-2	EN 61000-3-2	EN 61000-3-2
• for interference immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2

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Technical specifications (continued)

Article number	6EP1332-4BA00	6EP1332-4BA00-8AA0	6EP1333-4BA00	6EP1333-4BA00-8AA0
product brand name	SIMATIC	SIMATIC	SIMATIC	SIMATIC
type of current supply	24 V/3 A	24 V/3 A	24 V/8 A	24 V/8 A
standards, specifications, approvals				
certificate of suitability				
• CE marking	Yes	Yes	Yes	Yes
• UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
• UKCA marking	Yes	Yes	Yes	Yes
• EAC approval	Yes	Yes	Yes	Yes
• Regulatory Compliance Mark (RCM)	Yes	Yes	Yes	Yes
• NEC Class 2	No	No	No	No
type of certification				
• BIS	Yes; R-41183539	Yes; R-41183539	Yes; R-41183539	Yes; R-41183539
• CB-certificate	Yes	Yes	Yes	Yes
MTBF at 40 °C	1 611 993 h	1 611 993 h	1 362 918 h	1 362 918 h
standards, specifications, approvals hazardous environments				
certificate of suitability				
• IECEx	No	Yes; IECEx Ex nA nC IIC T4 Gc	No	Yes; IECEx Ex nA nC IIC T3 Gc
• ATEX	No	Yes; ATEX (EX) II 3G Ex ec nC IIC T4 Gc	No	Yes; ATEX (EX) II 3G Ex ec nC IIC T3 Gc
• ULhazloc approval	No	Yes; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	No	Yes; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T3, File E330455
• UKEX	No	Yes	No	Yes
• CCC for hazardous zone according to GB standard	No	Yes	No	Yes
• FM registration	No	Yes; Class I, Div. 2, Group ABCD, T4	No	Yes; Class I, Div. 2, Group ABCD, T4
standards, specifications, approvals marine classification				
shipbuilding approval	Yes	Yes	Yes	Yes
Marine classification association				
• American Bureau of Shipping Europe Ltd. (ABS)	Yes	Yes	Yes	Yes
• French marine classification society (BV)	Yes	Yes	Yes	Yes
• Det Norske Veritas (DNV)	Yes	Yes	Yes	Yes
• Lloyds Register of Shipping (LRS)	No	No	No	No
standards, specifications, approvals Environmental Product Declaration				
Environmental Product Declaration	Yes		Yes	
global warming potential [CO2 eq]				
• total	309.8 kg		589.1 kg	
• during manufacturing	8.6 kg		14 kg	
• during operation	300.8 kg		574.3 kg	
• after end of life	0.31 kg		0.51 kg	
ambient conditions				
ambient temperature				
• during operation	0 ... 60 °C; with natural convection	0 ... 60 °C; with natural convection	0 ... 60 °C; with natural convection	0 ... 60 °C; with natural convection
• in horizontal mounting position during operation	0 ... 60 °C	0 ... 60 °C	0 ... 60 °C	0 ... 60 °C
• in vertical mounting position during operation	0 ... 40 °C	0 ... 40 °C	0 ... 40 °C	0 ... 40 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation

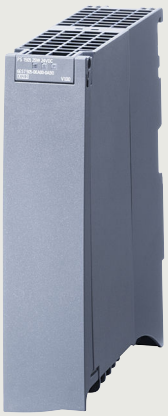
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Technical specifications (continued)

Article number	6EP1332-4BA00	6EP1332-4BA00-8AA0	6EP1333-4BA00	6EP1333-4BA00-8AA0
product brand name	SIMATIC	SIMATIC	SIMATIC	SIMATIC
type of current supply	24 V/3 A	24 V/3 A	24 V/8 A	24 V/8 A
connection method				
type of electrical connection	Screw-/spring clamp connection	Screw-/spring clamp connection	Screw-/spring clamp connection	Screw-/spring clamp connection
• at input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm²	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm²	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm²	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm²
• at output	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm²	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm²	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm²	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm²
removable terminal at input	Yes	Yes	Yes	Yes
removable terminal at output	Yes	Yes	Yes	Yes
mechanical data				
width × height × depth of the enclosure	50 mm × 147 mm × 129 mm	50 mm × 147 mm × 129 mm	75 mm × 147 mm × 129 mm	75 mm × 147 mm × 129 mm
installation width × mounting height	50 mm × 205 mm	50 mm × 205 mm	75 mm × 205 mm	75 mm × 205 mm
required spacing				
• top	40 mm	40 mm	40 mm	40 mm
• bottom	40 mm	40 mm	40 mm	40 mm
• left	0 mm	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm	0 mm
fastening method	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail
• DIN-rail mounting	No	No	No	No
• S7 rail mounting	Yes	Yes	Yes	Yes
• wall mounting	No	No	No	No
housing can be lined up	Yes	Yes	Yes	Yes
net weight	0.45 kg	0.45 kg	0.74 kg	0.74 kg
further information internet links				
internet link				
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop	https://siemens.com/sitop	https://siemens.com/sitop	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com	https://support.industry.siemens.com	https://support.industry.siemens.com
identification link	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
additional information				
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



- System power supplies for SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- In addition with PS 60W 24/48/60V DC HF: Retentive storage of CPU work memory (data) for all S7-1500 CPUs

Selection and ordering data

System power supply	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500, integrated power meter function	**6ES7505-0KA01-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
Accessories	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
SIMATIC S7-1500 spare part, connector For system power supply modules (PS) and load current supply modules (PM), 10 pieces per packing unit	**6ES7590-8AA00-0AA0**
SIMATIC S7-1500 spare part, front door For 35 mm wide power supply and PTP CP, 5 units per packing unit	**6ES7528-0AA80-7AA0**

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Technical specifications

Article number	6ES7505-0KA00-0AB0	6ES7505-0RA00-0AB0	6ES7505-0RB00-0AB0	6ES7507-0RA00-0AB0	6ES7505-0KA01-0AB0
	S7-1500, PS 25W 24V DC	S7-1500, PS 60W 24/48/60V DC	S7-1500, PS 60W 24/48/60V DC HF	S7-1500, PS 60W 120/230V AC/DC	S7-1500, PS 25W 24V DC
General information					
Product type designation	PS 25W 24VDC	PS 60 W 24/48/60 V DC	PS 60 W 24/48/60 V DC HF	PS 60 W 120/230 V AC/DC	PS 25W 24VDC
Product function					
• Voltage measurement					Yes; 19.2 ... 28.8 V DC (±2.5 %)
• Current measurement					Yes; 0 ... 1.67 A (±2.5 %)
• Power measurement					Yes; 0 ... 25 W (± 5 %)
• I&M data					Yes
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V12 / V12	V12 / V12	V14 SP1	V12 / V12	STEP 7 V18 or higher with HSP 0458
• STEP 7 configurable/integrated from version	V5.5 SP3 or higher	V5.5 SP3 or higher		V5.5 SP3 or higher	STEP 7 V5.7 or higher SP1 or higher
• PROFINET from GSD version/GSD revision					V2.45
Redundancy					
• Redundancy capability					Yes
- for uprating					Yes
Installation type/mounting					
Rail mounting					Yes
Supply voltage					
Rated value (DC)	24 V	24 V / 48 V / 60 V	24 V / 48 V / 60 V	120 V / 230 V	24 V
Rated value (AC)				120 V / 230 V	
Reverse polarity protection	Yes	Yes	Yes		Yes
Short-circuit protection	Yes	Yes	Yes	Yes	Yes
Line frequency					
• permissible range, lower limit				47 Hz	
• permissible range, upper limit				63 Hz	
Mains buffering					
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	20 ms	20 ms
Input current					
Rated value at 24 V DC	1.3 A	3 A	3 A		1.3 A
Rated value at 48 V DC		1.5 A	1.5 A		
Rated value at 60 V DC		1.2 A	1.2 A		
Rated value at 120 V DC				0.6 A	
Rated value at 230 V DC				0.3 A	
Rated value at 120 V AC				0.6 A	
Rated value at 230 V AC				0.34 A	
Inrush current, max.			≤ 8 A for t ≤ 1 s		
Output current					
Short-circuit protection	Yes	Yes	Yes	Yes	Yes
Power					
Infeed power to the backplane bus	25 W	60 W	60 W	60 W	25 W
Power loss					
Power loss at nominal rating conditions	6.2 W	12 W	12 W	12 W	6.2 W
Interrupts/diagnostics/status information					
Status indicator	Yes	Yes	Yes	Yes	Yes
Potential separation					
primary/secondary	Yes	Yes; Electrical isolation for 230 V AC (reinforced isolation)		Yes	Yes

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Technical specifications (continued)

Article number	6ES7505-0KA00-0AB0 S7-1500, PS 25W 24V DC	6ES7505-0RA00-0AB0 S7-1500, PS 60W 24/48/60V DC	6ES7505-0RB00-0AB0 S7-1500, PS 60W 24/48/60V DC HF	6ES7507-0RA00-0AB0 S7-1500, PS 60W 120/230V AC/DC	6ES7505-0KA01-0AB0 S7-1500, PS 25W 24V DC
EMC					
Interference immunity against voltage surge					
• Interference immunity on supply lines acc. to IEC 61000-4-5	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±0.5 kV (acc. to IEC 61000-4-5; 2014; surge line to line), ±1 kV (acc. to IEC 61000-4-5; 2014; surge line to earth), no external protective circuit required
Degree and class of protection					
Equipment protection class	III, with protective conductor	I, with protective conductor	I, with protective conductor	I, with protective conductor	III
Security					
signed firmware update					Yes
Ambient conditions					
Ambient temperature during operation					
• min.	-25 °C; up to FS03: 0 °C	-25 °C; up to FS04: 0 °C	-25 °C; up to FS02: 0 °C	-25 °C; up to FS04: 0 °C	-30 °C
• max.	60 °C	60 °C	60 °C	60 °C	60 °C
• horizontal installation, min.	-25 °C; up to FS03: 0 °C	-25 °C; up to FS04: 0 °C	-25 °C; up to FS02: 0 °C		-25 °C
• horizontal installation, max.	60 °C	60 °C	60 °C		60 °C
• vertical installation, min.	-25 °C; up to FS03: 0 °C	-25 °C; up to FS04: 0 °C	-25 °C; up to FS02: 0 °C		-25 °C
• vertical installation, max.	40 °C	40 °C	40 °C		40 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m	2 000 m	2 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions					
Width	35 mm	70 mm	105 mm	70 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
Weights					
Weight, approx.	350 g	600 g	865 g	600 g	350 g

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Overview



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

Note

SIPLUS extreme products are based on Siemens standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

SIPLUS S7-1500 PM 1507		
Article No.	**6AG1332-4BA00-7AA0**	**6AG1333-4BA00-7AA0**
Article No. based on	**6EP1332-4BA00**	**6EP1333-4BA00**
Range of ambient temperature	-40 ... +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical specifications	The technical specifications of the standard product apply, except for the ambient conditions.	
Ambient conditions		
Extended range of ambient conditions		

• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) //
	Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) //
	Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	

Relative humidity		
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)	
Resistance		
• to biologically active substances/compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.	
• to chemically active substances/compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.	
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.	

Selection and ordering data

SIPLUS S7-1500 PM 1507	
(Extended temperature range and exposure to environmental substances)	
Input 120/230 V AC, output 24 V DC, 3 A	**6AG1332-4BA00-7AA0**
Input 120/230 V AC, output 24 V DC, 8 A	**6AG1333-4BA00-7AA0**
Accessories	See SITOP in SIMATIC design, 1-phase, 24 V DC (for S7-1500 and ET200MP)

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Technical specifications

Article number	6AG1332-4BA00-7AA0	6AG1333-4BA00-7AA0
product brand name	SIPLUS	SIPLUS
type of current supply	24 V/3 A	24 V/8 A
General information		
Technical Product Detail Page	https://i.siemens.com/1P6AG1332-4BA00-7AA0	https://i.siemens.com/1P6AG1333-4BA00-7AA0
manufacturer's article number of the basic version used for SIPLUS product versions	6EP1332-4BA00	6EP1333-4BA00
input		
type of the power supply network	1-phase AC	1-phase AC
supply voltage at AC	Automatic range selection	Automatic range selection
supply voltage	120 V/230 V	120 V/230 V
input voltage 1 at AC	85 ... 132 V	85 ... 132 V
input voltage 2 at AC	170 ... 264 V	170 ... 264 V
wide range input	No	No
overvoltage overload capability	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms
buffering time for rated value of the output current in the event of power failure minimum	20 ms	20 ms
operating condition of the mains buffering	at Vin = 93/187 V	at Vin = 93/187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	45 ... 65 Hz	45 ... 65 Hz
input current		
• at rated input voltage 120 V	1.4 A	3.7 A
• at rated input voltage 230 V	0.8 A	1.7 A
current limitation of inrush current at 25 °C maximum	23 A	62 A
duration of inrush current limiting at 25 °C		
• maximum	3 ms	3 ms
I2t value maximum	1.3 A^2·s	12 A^2·s
fuse protection type	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
fuse protection type in the feeder	Recommended miniature circuit breaker: 10 A characteristic B or 6 A characteristic C	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C
output		
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	24 V	24 V
output voltage		
• at output 1 at DC rated value	24 V	24 V
	24 V	24 V
output voltage adjustable	No	No
relative overall tolerance of the voltage	1 %	1 %
relative control precision of the output voltage		
• on slow fluctuation of input voltage	0.1 %	0.1 %
• on slow fluctuation of ohm loading	0.1 %	0.1 %
residual ripple		
• maximum	50 mV	50 mV
voltage peak		
• maximum	150 mV	150 mV
display version for normal operation	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by
behavior of the output voltage when switching on	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)
response delay maximum	1.5 s	1.5 s
voltage increase time of the output voltage		
• typical	10 ms	10 ms
output current		
• rated value	3 A	8 A
• rated range	0 ... 3 A	0 ... 8 A
	2.6 ... 4.9 A	5.1 ... 9.9 A
supplied active power typical	72 W	192 W
short-term overload current		
• on short-circuiting during the start-up typical	12 A	35 A

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Technical specifications (continued)

Article number	6AG1332-4BA00-7AA0	6AG1333-4BA00-7AA0
product brand name	SIPLUS	SIPLUS
type of current supply	24 V/3 A	24 V/8 A
• at short-circuit during operation typical	12 A	35 A
duration of overloading capability for excess current		
• on short-circuiting during the start-up	70 ms	70 ms
• at short-circuit during operation	70 ms	70 ms
bridging of equipment	Yes	Yes
number of parallel-switched equipment resources	2	2
efficiency		
efficiency in percent	87 %	90 %
power loss [W]		
• at rated output voltage for rated value of the output current typical	11 W	21 W
closed-loop control		
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.1 %	0.1 %
relative control precision of the output voltage load step of resistive load 50/100/50 % typical	1 %	2 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	3 %	3 %
setting time		
• load step 10 to 90% typical	5 ms	5 ms
• load step 90 to 10% typical	5 ms	5 ms
• maximum	5 ms	5 ms
protection and monitoring		
design of the overvoltage protection	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V
property of the output short-circuit proof	Yes	Yes
design of short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
response value current limitation	3.15 ... 3.6 A	8.4 ... 9.6 A
• typical	3.4 A	9 A
safety		
galvanic isolation between input and output	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class I	Class I
leakage current		
• maximum	3.5 mA	3.5 mA
• typical	0.4 mA	1.3 mA
protection class IP	IP20	IP20
EMC		
standard		
• for emitted interference	EN 55022 Class B	EN 55022 Class B
• for mains harmonics limitation	EN 61000-3-2	EN 61000-3-2
• for interference immunity	EN 61000-6-2	EN 61000-6-2
standards, specifications, approvals		
certificate of suitability		
• CE marking	Yes	Yes
• UKCA marking	Yes	Yes
MTBF at 40 °C	1 611 993 h	1 362 918 h
ambient conditions		
ambient temperature		
• in horizontal mounting position during operation	-40 ... +70 °C; with natural convection	-40 ... +70 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
installation altitude at height above sea level maximum	6 000 m	6 000 m

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Technical specifications (continued)

Article number	6AG1332-4BA00-7AA0	6AG1333-4BA00-7AA0
product brand name	SIPLUS	SIPLUS
type of current supply	24 V/3 A	24 V/8 A
ambient condition relating to ambient temperature - air pressure - installation altitude	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m	In case of operation at altitudes of 2000 - 6000 m above sea level: Output power derating of -7.5 %/1000 m or reduction of the ambient temperature by 5 K/1000 m
relative humidity with condensation according to IEC 60068-2-38 maximum	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation	100 %; RH incl. condensation/frost (no commissioning if condensation is present), horizontal installation
chemical resistance to commercially available cooling lubricants	Yes; incl. diesel and oil droplets in the air	Yes; incl. diesel and oil droplets in the air
resistance to biologically active substances conformity according to EN 60721-3-3	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request	Yes; Class 3B2 mold, fungal, sponge spores (except fauna); class 3B3 upon request
resistance to chemically active substances conformity according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)
resistance to mechanically active substances conformity according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust
resistance to biologically active substances conformity according to EN 60721-3-6	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)	Yes; Class 6B2 mold, fungal, sponge spores (except fauna)
resistance to chemically active substances conformity according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity level 3)
resistance to mechanically active substances conformity according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust
coating for equipped printed circuit board according to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
type of coating protection against pollution according to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
type of test of the coating according to MIL-I-46058C	Yes; Discoloration of the coating during service life possible	Yes; Discoloration of the coating during service life possible
product conformity of the coating Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal Coating, Class A	Yes; Conformal Coating, Class A
connection method		
type of electrical connection	Screw-/spring clamp connection	Screw-/spring clamp connection
• at input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2
• at output	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm^2	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm^2
removable terminal at input	Yes	Yes
removable terminal at output	Yes	Yes
mechanical data		
width × height × depth of the enclosure	50 mm × 147 mm × 129 mm	75 mm × 147 mm × 129 mm
installation width × mounting height	50 mm × 205 mm	75 mm × 205 mm
required spacing		
• top	40 mm	40 mm
• bottom	40 mm	40 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
fastening method	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail
• DIN-rail mounting	No	No
• S7 rail mounting	Yes	Yes
• wall mounting	No	No
housing can be lined up	Yes	Yes
net weight	0.45 kg	0.74 kg
further information internet links		
internet link		
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
additional information		
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



- System power supplies for SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Engineering and configuration via STEP 7 V12

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS S7-1500 system power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 Controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Accessories	See SIMATIC S7-1500, system power supplies

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Technical specifications

Article number	6AG1505-0KA00-7AB0	6AG1505-0KA01-7AB0	6AG1505-0RA00-7AB0	6AG1507-0RA00-7AB0
	SIPLUS S7-1500 PS 25W 24V DC	SIPLUS S7-1500 PS 1505 25W 24VDC	SIPLUS S7-1500 PS 60W 24/48/60V DC	SIPLUS S7-1500 PS 60W 120/230V AC/DC
General information				
Product type designation	PS 25W 24VDC	PS 25W 24VDC	PS 60 W 24/48/60 V DC	PS 60 W 120/230 V AC/DC
Product function				
• Voltage measurement		Yes; 19.2 ... 28.8 V DC (±2.5 %)		
• Current measurement		Yes; 0 ... 1.67 A (±2.5 %)		
• Power measurement		Yes; 0 ... 25 W (± 5 %)		
• I&M data		Yes		
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Redundancy				
• Redundancy capability		Yes		
- for uprating		Yes		
Installation type/mounting				
Rail mounting		Yes		
Supply voltage				
Rated value (DC)	24 V; SELV	24 V	24 V / 48 V / 60 V	120 V / 230 V
Rated value (AC)				120 V / 230 V
Reverse polarity protection	Yes	Yes	Yes	
Short-circuit protection	Yes	Yes	Yes	Yes
Line frequency				
• permissible range, lower limit				47 Hz
• permissible range, upper limit				63 Hz
Mains buffering				
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	20 ms
Input current				
Rated value at 24 V DC	1.3 A	1.3 A	3 A	
Rated value at 48 V DC			1.5 A	
Rated value at 60 V DC			1.2 A	
Rated value at 120 V DC				0.6 A
Rated value at 230 V DC				0.3 A
Rated value at 120 V AC				0.6 A
Rated value at 230 V AC				0.34 A
Output current				
Short-circuit protection	Yes	Yes		
Power				
Infeed power to the backplane bus	25 W; > +60 °C max. power input 12.5 W	25 W; > +60 °C max. power input 12.5 W	60 W; > +60 °C max. power input 30 W	60 W; > +60 °C max. power input 30 W
Power loss				
Power loss at nominal rating conditions	6.2 W	6.2 W	12 W	12 W
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Potential separation				
primary/secondary	Yes	Yes	Yes; Electrical isolation for 230 V AC (reinforced isolation)	Yes
EMC				
Interference immunity against voltage surge				
• Interference immunity on supply lines acc. to IEC 61000-4-5	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±0.5 kV (acc. to IEC 61000-4-5; 2014; surge line to line), ±1 kV (acc. to IEC 61000-4-5; 2014; surge line to earth), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required

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Technical specifications (continued)

Article number	6AG1505-0KA00-7AB0 SIPLUS S7-1500 PS 25W 24V DC	6AG1505-0KA01-7AB0 SIPLUS S7-1500 PS 1505 25W 24VDC	6AG1505-0RA00-7AB0 SIPLUS S7-1500 PS 60W 24/48/60V DC	6AG1507-0RA00-7AB0 SIPLUS S7-1500 PS 60W 120/230V AC/DC
Degree and class of protection				
Equipment protection class	III, with protective conductor	III	I, with protective conductor	I, with protective conductor
Security				
signed firmware update		Yes		
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; > +60 °C max. infeed power 12.5 W	70 °C; = Tmax; > +60 °C max. power input 30 W; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C
• horizontal installation, min.		-40 °C; = Tmin (incl. condensation/frost)		
• horizontal installation, max.		70 °C; = Tmax; > +60 °C max. infeed power 12.5 W		
• vertical installation, min.		-40 °C; = Tmin		
• vertical installation, max.		40 °C; = Tmax		
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)		Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

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Technical specifications (continued)

Article number	6AG1505-0KA00-7AB0	6AG1505-0KA01-7AB0	6AG1505-0RA00-7AB0	6AG1507-0RA00-7AB0
	SIPLUS S7-1500 PS 25W 24V DC	SIPLUS S7-1500 PS 1505 25W 24VDC	SIPLUS S7-1500 PS 60W 24/48/60V DC	SIPLUS S7-1500 PS 60W 120/230V AC/DC
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions				
Width	35 mm	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	350 g	350 g	600 g	600 g

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Overview



Basic Panels 2nd Generation

With their fully developed HMI basic functions, SIMATIC HMI Basic Panels 2nd Generation are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or bar code scanner, and supports the simple archiving of data on a USB flash drive as well as the manual backup and restoring of the complete panel.

The integrated Ethernet or RS 485/RS 422 interface (version-specific) enables simple connection to the controller.

More information is available at this link

Selection and ordering data

SIMATIC HMI Basic Panels (2 nd Generation)	
Key and touch devices	
SIMATIC HMI KTP400 Basic Key/touch operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	**6AV2123-2DB03-0AX0**
SIMATIC HMI TP400 Basic Keyless Touch screen operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	**6AV2143-6DB00-0AA0**
SIMATIC HMI KTP700 Basic Key/touch operation; 7" TFT display, 65 536 colors, PROFINET interface	**6AV2123-2GB03-0AX0**
SIMATIC HMI KTP700 Basic DP Key/touch operation; 7" TFT display, 65 536 colors, PROFIBUS interface	**6AV2123-2GA03-0AX0**
SIMATIC HMI TP700 Basic Keyless Touch screen operation; 7" TFT display, 65 536 colors, PROFINET interface	**6AV2143-6GB00-0AA0**
SIMATIC HMI KTP900 Basic Key/touch operation; 9" TFT display, 65 536 colors, PROFINET interface	**6AV2123-2JB03-0AX0**
SIMATIC HMI TP900 Basic Keyless Touch screen operation; 9" TFT display, 65 536 colors, PROFINET interface	**6AV2143-6JB00-0AA0**
SIMATIC HMI KTP1200 Basic Key/touch operation; 12" TFT display, 65 536 colors, PROFINET interface	**6AV2123-2MB03-0AX0**
SIMATIC HMI KTP1200 Basic DP Key/touch operation; 12" TFT display, 65 536 colors, PROFIBUS interface	**6AV2123-2MA03-0AX0**
Documentation	
You can find the Equipment Manual for the Basic Panels on the Internet at:	Link
Accessories	See catalog ST 80 / ST PC

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Overview



SIMATIC HMI MTP2200 Unified Comfort Panel Standard design front view

SIMATIC HMI Unified Comfort Panels - standard devices

SIMATIC HMI Unified Comfort Panels consist of six different devices with varying display sizes.
All devices come with the same number of hardware interfaces and the same functionality – just select the perfect device for your needs based on the screen size.

Each Unified Comfort Panel is available in the standard design with Siemens and SIMATIC HMI branding and a silver-colored aluminum frame.

All Unified Comfort Panels come with integrated Edge functionality.

SIMATIC WinCC Unified contains visualization, communication, alarms/warnings, report creation, administration of parameter sets, archiving of user administration.
Furthermore, a WinCC Unified Client Operate (V17 or higher) for remote operator control and monitoring, and a WinCC Unified Client Monitor (V18 or higher) for monitoring only are also included.
Additional clients can be enabled with a license. Up to three client licenses can be used.

Client access is based on native web technologies such as HTML5, SVG and JavaScript. The visualization can be accessed via any modern web browser – without the need for additional installation.

Siemens Industrial Edge can be used in two different ways:

- Device-managed Edge
- Centrally-managed Edge (planned)

SIMATIC HMI Unified Comfort Panels can also be ordered with a neutral design.

Note:

The technical specifications of the neutral design devices correspond to the technical specifications of the devices with standard design.

Selection and ordering data

Touch devices for SIMATIC HMI Unified Comfort Panels	
Standard design	
SIMATIC HMI MTP700 Unified Comfort Panel 7" widescreen TFT display, touch operation, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source SW which is provided free of charge. See enclosed DVD	**6AV2128-3GB06-0AX1**
SIMATIC HMI MTP1000 Unified Comfort Panel 10.1" widescreen TFT display, touch operation, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source SW which is provided free of charge. See enclosed DVD	**6AV2128-3KB06-0AX1**
SIMATIC HMI MTP1200 Unified Comfort Panel 12.1" widescreen TFT display, touch operation, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source SW which is provided free of charge. See enclosed DVD	**6AV2128-3MB06-0AX1**
SIMATIC HMI MTP1500 Unified Comfort Panel 15.6" widescreen TFT display, touch operation, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source SW which is provided free of charge. See enclosed DVD	**6AV2128-3QB06-0AX1**
SIMATIC HMI MTP1900 Unified Comfort Panel 18.5" widescreen TFT display, touch operation, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source software, which is provided free of charge. See enclosed DVD	**6AV2128-3UB06-0AX1**
SIMATIC HMI MTP2200 Unified Comfort Panel 21.5" widescreen TFT display, touch operation, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source software, which is provided free of charge. See enclosed DVD	**6AV2128-3XB06-0AX1**
Neutral design	
SIMATIC HMI MTP700 Unified Comfort Panel Neutral, touch operation; 7" widescreen TFT display, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source software, which is provided free of charge. See enclosed DVD	**6AV2128-3GB36-0AX1**

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Selection and ordering data (continued)

SIMATIC HMI MTP1000 Unified Comfort Panel Neutral, touch operation; 10.1" widescreen TFT display, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source software, which is provided free of charge. See enclosed DVD	**6AV2128-3KB36-0AX1**
SIMATIC HMI MTP1200 Unified Comfort Panel Neutral, touch operation; 12.1" widescreen TFT display, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source software, which is provided free of charge. See enclosed DVD	**6AV2128-3MB36-0AX1**
SIMATIC HMI MTP1500 Unified Comfort Panel Neutral, touch operation; 15.6" widescreen TFT display, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source software, which is provided free of charge. See enclosed DVD	**6AV2128-3QB36-0AX1**
SIMATIC HMI MTP1900 Unified Comfort Panel Neutral, touch operation; 18.5" widescreen TFT display, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source software, which is provided free of charge. See enclosed DVD	**6AV2128-3UB36-0AX1**
SIMATIC HMI MTP2200 Unified Comfort Panel Neutral, touch operation; 21.5" widescreen TFT display, 16 million colors, PROFINET interface, configurable as from WinCC Unified Comfort V16; with additional certifications for explosion-proof areas and for use in marine engineering (see Technical specifications). Contains open source software, which is provided free of charge. See enclosed DVD	**6AV2128-3XB36-0AX1**
Software	
EDGE Runtime for SIMATIC Unified Comfort Runtime software, single license, license key for download, without software and documentation, Class A, email address required for delivery	**6AV2170-2BA00-0AA0**

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Overview



SIMATIC HMI Comfort Panels - Standard devices

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- All versions can be used as an OPC UA client or as a server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal engineering framework

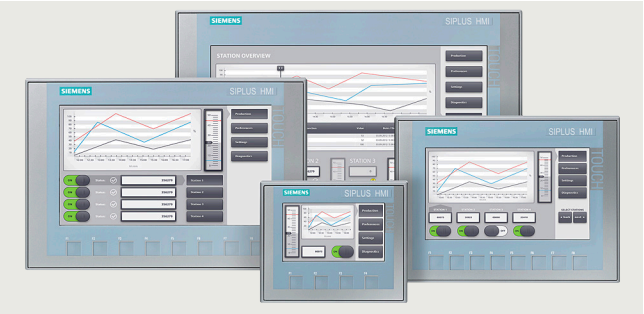
Note:
A 7" and a 15" Comfort Outdoor version are available. These devices have been specially designed for outdoor applications in difficult environments. Best display quality, even under sunlight, UV-resistant fronts and much more.
More information is available at this link

Selection and ordering data

SIMATIC HMI Comfort Panels	
Touch devices	
SIMATIC HMI TP700 Comfort Touch operation; 7" widescreen display	**6AV2124-0GC01-0AX0**
SIMATIC HMI TP900 Comfort Touch operation; 9" widescreen display	**6AV2124-0JC01-0AX0**
SIMATIC HMI TP1200 Comfort Touch operation; 12" widescreen display	**6AV2124-0MC01-0AX0**
SIMATIC HMI TP1500 Comfort Touch operation; 15" widescreen display; Ambient temperature up to 50 °C (up to 55 °C with restriction)	**6AV2124-0QC02-0AX1**
SIMATIC HMI TP1500 Comfort Touch operation; 15" widescreen display; Ambient temperature up to 45 °C	**6AV2124-0QC02-0AX2**
SIMATIC HMI TP1900 Comfort Touch operation; 19" widescreen display	**6AV2124-0UC02-0AX1**
SIMATIC HMI TP2200 Comfort Touch operation; 22" widescreen display	**6AV2124-0XC02-0AX1**
Key devices	
SIMATIC HMI KP700 Comfort Key operation; 7" widescreen display	**6AV2124-1GC01-0AX0**
SIMATIC HMI KP900 Comfort Key operation; 9" widescreen display	**6AV2124-1JC01-0AX0**
SIMATIC HMI KP1200 Comfort Key operation; 12" widescreen display	**6AV2124-1MC01-0AX0**
SIMATIC HMI KP1500 Comfort Key operation; 15" widescreen display; Ambient temperature up to 50 °C (up to 55 °C with restriction)	**6AV2124-1QC02-0AX1**
SIMATIC HMI KP1500 Comfort Key operation; 15" widescreen display; Ambient temperature up to 45 °C	**6AV2124-1QC02-0AX2**
Accessories	See catalog ST 80 / ST PC

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Overview



With their fully developed HMI basic functions, 2nd Generation SIPLUS Basic Panels are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS HMI Basic Panels, Key and Touch	
SIPLUS HMI KTP400 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	**6AG1123-2DB03-2AX0**
SIPLUS HMI KTP700 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	**6AG1123-2GB03-2AX0**
SIPLUS HMI KTP700 Basic DP For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	**6AG1123-2GA03-2AX0**
SIPLUS HMI KTP900 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	**6AG1123-2JB03-2AX0**
SIPLUS HMI KTP1200 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C	**6AG1123-2MB03-2AX0**
SIPLUS HMI KTP1200 Basic DP For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C	**6AG1123-2MA03-2AX0**
Accessories	See catalog ST 80 / ST PC

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Technical specifications

Article number	6AG1123-2DB03-2AX0 SIPLUS HMI KTP400 BASIC	6AG1123-2GB03-2AX0 SIPLUS HMI KTP700 BASIC	6AG1123-2GA03-2AX0 SIPLUS HMI KTP700 BASIC DP
General information			
Product type designation	KTP400 Basic color PN	KTP700 Basic color PN	KTP700 Basic color DP
Display			
Design of display	TFT widescreen display, LED backlighting	TFT widescreen display, LED backlighting	TFT widescreen display, LED backlighting
Screen diagonal	4.3 in	7 in	7 in
Number of colors	65 536	65 536	65 536
Resolution (pixels)			
• Horizontal image resolution	480 pixel	800 pixel	800 pixel
• Vertical image resolution	272 pixel	480 pixel	480 pixel
Backlighting			
• MTBF backlighting (at 25 °C)	20 000 h	20 000 h	20 000 h
Control elements			
Keyboard			
• Function keys			
- Number of function keys	4	8	8
Touch operation			
• Design as touch screen	Yes; Analog-resistive	Yes; Analog-resistive	Yes; Analog-resistive
Installation type/mounting			
Wall mounting/direct mounting	No	No	
Mounting in portrait format possible	Yes	Yes	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Storage			
Memory available for user data	10 Mbyte	10 Mbyte	10 Mbyte
Type of output			
Acoustics			
• Buzzer	Yes	Yes	Yes
Time of day			
Clock			
• Software clock	Yes	Yes	Yes
• retentive	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks
• synchronizable	Yes	Yes	Yes
Interfaces			
Number of industrial Ethernet interfaces	1	1	0
Number of RS 485 interfaces	0	0	1
Number of USB interfaces	1; Up to 16 GB	1; Up to 16 GB	1; Up to 16 GB
Number of SD card slots	0	0	0
Protocols			
PROFINET	Yes	Yes	No
IRT	No	No	No
PROFIBUS	No	No	Yes
MPI	No	No	Yes
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
Degree and class of protection			
IP (at the front)	IP65	IP65	IP65
IP (rear)	IP20	IP20	IP20
NEMA (front)			
• Enclosure Type 4x at the front	Yes	Yes	Yes
Ambient conditions			
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m

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Technical specifications (continued)

Article number	6AG1123-2DB03-2AX0 SIPLUS HMI KTP400 BASIC	6AG1123-2GB03-2AX0 SIPLUS HMI KTP700 BASIC	6AG1123-2GA03-2AX0 SIPLUS HMI KTP700 BASIC DP
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Languages			
Online languages			
• Number of online/runtime languages	10	10	10
Functionality under WinCC (TIA Portal)			
Applications/options			
• Web browser		Yes	No
• SIMATIC WinCC Sm@rtServer	Yes; Available with WinCC (TIA Portal) V14 or higher	Yes; Available with WinCC (TIA Portal) V14 or higher	No

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Technical specifications (continued)

Article number	6AG1123-2DB03-2AX0 SIPLUS HMI KTP400 BASIC	6AG1123-2GB03-2AX0 SIPLUS HMI KTP700 BASIC	6AG1123-2GA03-2AX0 SIPLUS HMI KTP700 BASIC DP
Number of Visual Basic Scripts	No	No	No
Task planner	Yes	Yes	Yes
• time-controlled	No	No	No
• task-controlled	Yes	Yes	Yes
Message system			
• Bit messages			
- Number of bit messages	1 000	1 000	1 000
• Analog messages			
- Number of analog messages	25	25	25
• Message buffer	Yes		
- Number of entries	256	256	256
- Circulating buffer	Yes	Yes	Yes
- retentive	Yes	Yes	Yes
Recipe management			
• Number of recipes	50	50	50
• Size of internal recipe memory	256 kbyte	256 kbyte	256 kbyte
• Recipe memory expandable	No	No	No
Variables			
• Number of variables per device	800	800	800
• Number of variables per screen	100	100	100
Images			
• Number of configurable images	250	250	250
Archiving			
• Number of archives per device	2; One message and one process value archive	2; One message and one process value archive	2; One message and one process value archive
• Number of entries per archive	10 000	10 000	10 000
• Message archive	Yes	Yes	Yes
• Process value archive	Yes	Yes	Yes
• Archiving methods			
- Sequential archive	Yes	Yes	Yes
- Short-term archive	Yes	Yes	Yes
• Memory location			
- Memory card	No	No	No
- USB memory	Yes	Yes	Yes
- Ethernet	No	No	No
• Data storage format			
- CSV	No	No	No
- TXT	Yes	Yes	Yes
- RDB	No	No	No
Security			
• Number of user groups	50	50	50
• Number of users	50	50	50
• SIMATIC Logon	No	No	No
Transfer (upload/download)			
• MPI/PROFIBUS DP	No	No	Yes
• Ethernet	Yes	Yes	No
Process coupling			
• S7-1200	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes
• WinAC	Yes	Yes	Yes
• SIMOTION	Yes	Yes	Yes
• Allen Bradley (EtherNet/IP)	Yes	Yes	No

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Technical specifications (continued)

Article number	6AG1123-2DB03-2AX0 SIPLUS HMI KTP400 BASIC	6AG1123-2GB03-2AX0 SIPLUS HMI KTP700 BASIC	6AG1123-2GA03-2AX0 SIPLUS HMI KTP700 BASIC DP
• Allen Bradley (DF1)	No	No	Yes
• Mitsubishi (MC TCP/IP)	Yes	Yes	No
• Mitsubishi (FX)	No	No	Yes
• OMRON (FINS TCP)	No	No	No
• OMRON (Host Link)	No	No	Yes
• Modicon (Modbus TCP/IP)	Yes	Yes	No
• Modicon (Modbus RTU)	No	No	Yes
Peripherals/Options			
Printer	No	No	No
SIMATIC HMI MM memory card: Multi Media Card	No	No	No
SIMATIC HMI SD memory card: Secure Digital memory card	No	No	No
USB memory	Yes	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• plastic	Yes	Yes	Yes
• Aluminum	No	No	No
• Stainless steel	No	No	No
Dimensions			
Width of the housing front	140 mm	214 mm	214 mm
Height of housing front	116 mm	158 mm	158 mm
Mounting cutout, width	124 mm	198 mm	198 mm
Mounting cutout, height	100 mm	142 mm	142 mm
mounting depth	34.9 mm	39 mm	39 mm
Weights			
Weight (without packaging)	360 g	780 g	800 g

Article number	6AG1123-2JB03-2AX0 SIPLUS HMI KTP900 BASIC	6AG1123-2MB03-2AX0 SIPLUS HMI KTP1200 BASIC	6AG1123-2MA03-2AX0 SIPLUS HMI KTP1200 BASIC DP
General information			
Product type designation	KTP900 Basic color PN	KTP1200 Basic color PN	KTP1200 Basic color DP
Display			
Design of display	TFT widescreen display, LED backlighting	TFT widescreen display, LED backlighting	TFT widescreen display, LED backlighting
Screen diagonal	9 in	12 in	12 in
Number of colors	65 536	65 536	65 536
Resolution (pixels)			
• Horizontal image resolution	800 pixel	1 280 pixel	1 280 pixel
• Vertical image resolution	480 pixel	800 pixel	800 pixel
Backlighting			
• MTBF backlighting (at 25 °C)	20 000 h	20 000 h	20 000 h
Control elements			
Keyboard			
• Function keys			
- Number of function keys	8	10	10
Touch operation			
• Design as touch screen	Yes; Analog-resistive	Yes; Analog-resistive	Yes; Analog-resistive
Installation type/mounting			
Mounting in portrait format possible	Yes	Yes	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Storage			
Memory available for user data	10 Mbyte	10 Mbyte	10 Mbyte
Type of output			
Acoustics			

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Technical specifications (continued)

Article number	6AG1123-2JB03-2AX0 SIPLUS HMI KTP900 BASIC	6AG1123-2MB03-2AX0 SIPLUS HMI KTP1200 BASIC	6AG1123-2MA03-2AX0 SIPLUS HMI KTP1200 BASIC DP
• Buzzer	Yes	Yes	Yes
Time of day			
Clock			
• Software clock	Yes	Yes	Yes
• retentive	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks
• synchronizable	Yes	Yes	Yes
Interfaces			
Number of industrial Ethernet interfaces	1	1	0
Number of RS 485 interfaces	0	0	1
Number of USB interfaces	1; Up to 16 GB	1; Up to 16 GB	1; Up to 16 GB
Number of SD card slots	0	0	0
Protocols			
PROFINET	Yes	Yes	No
IRT	No	No	No
PROFIBUS	No	No	Yes
MPI	No	No	Yes
Redundancy mode			
- Media redundancy			
- MRP	No	No	No
Degree and class of protection			
IP (at the front)	IP65	IP65	IP65
IP (rear)	IP20	IP20	IP20
NEMA (front)			
• Enclosure Type 4x at the front	Yes	Yes	Yes
Ambient conditions			
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *

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Technical specifications (continued)

Article number	6AG1123-2JB03-2AX0 SIPLUS HMI KTP900 BASIC	6AG1123-2MB03-2AX0 SIPLUS HMI KTP1200 BASIC	6AG1123-2MA03-2AX0 SIPLUS HMI KTP1200 BASIC DP
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Languages			
Online languages			
• Number of online/runtime languages	10	10	10
Functionality under WinCC (TIA Portal)			
Applications/options			
• Web browser	Yes	Yes	No
• SIMATIC WinCC Sm@rtServer	Yes; Available with WinCC (TIA Portal) V14 or higher	Yes; Available with WinCC (TIA Portal) V14 or higher	No
Number of Visual Basic Scripts	No	No	No
Task planner	Yes	Yes	Yes
• time-controlled	No	No	No
• task-controlled	Yes	Yes	Yes
Message system			
• Bit messages			
- Number of bit messages	1 000	1 000	1 000
• Analog messages			
- Number of analog messages	25	25	25
• Message buffer	Yes		
- Number of entries	256	256	256
- Circulating buffer	Yes	Yes	Yes
- retentive	Yes	Yes	Yes
Recipe management			
• Number of recipes	50	50	50
• Size of internal recipe memory	256 kbyte	256 kbyte	256 kbyte
• Recipe memory expandable	No	No	No
Variables			
• Number of variables per device	800	800	800
• Number of variables per screen	100	100	100
Images			
• Number of configurable images	250	250	250
Archiving			
• Number of archives per device	2	2; One message and one process value archive	2
• Number of entries per archive	10 000	10 000	10 000

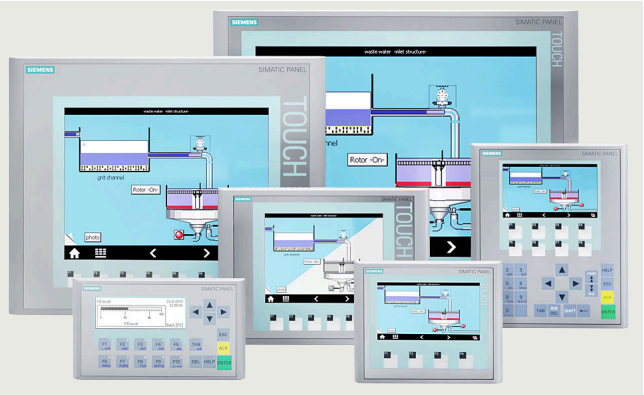
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Technical specifications (continued)

Article number	6AG1123-2JB03-2AX0 SIPLUS HMI KTP900 BASIC	6AG1123-2MB03-2AX0 SIPLUS HMI KTP1200 BASIC	6AG1123-2MA03-2AX0 SIPLUS HMI KTP1200 BASIC DP
• Message archive	Yes	Yes	Yes
• Process value archive	Yes	Yes	Yes
• Archiving methods			
- Sequential archive	Yes	Yes	Yes
- Short-term archive	Yes	Yes	Yes
• Memory location			
- Memory card	No	No	No
- USB memory	Yes	Yes	Yes
- Ethernet	No	No	No
• Data storage format			
- CSV	No	No	No
- TXT	Yes	Yes	Yes
- RDB	No	No	No
Security			
• Number of user groups	50	50	50
• Number of users	50	50	50
• SIMATIC Logon	No	No	No
Transfer (upload/download)			
• MPI/PROFIBUS DP	No	No	Yes
• Ethernet	Yes	Yes	No
Process coupling			
• S7-1200	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes
• WinAC	Yes	Yes	Yes
• SIMOTION	Yes	Yes	Yes
• Allen Bradley (EtherNet/IP)	Yes	Yes	No
• Allen Bradley (DF1)	No	No	Yes
• Mitsubishi (MC TCP/IP)	Yes	Yes	No
• Mitsubishi (FX)	No	No	Yes
• OMRON (FINS TCP)	No	No	No
• OMRON (Host Link)	No	No	Yes
• Modicon (Modbus TCP/IP)	Yes	Yes	No
• Modicon (Modbus RTU)	No	No	Yes
Peripherals/Options			
Printer	No	No	No
SIMATIC HMI MM memory card: Multi Media Card	No	No	No
SIMATIC HMI SD memory card: Secure Digital memory card	No	No	No
USB memory	Yes	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• plastic	Yes	Yes	Yes
• Aluminum	No	No	No
• Stainless steel	No	No	No
Dimensions			
Width of the housing front	267 mm	330 mm	330 mm
Height of housing front	182 mm	245 mm	245 mm
Mounting cutout, width	251 mm	310 mm	310 mm
Mounting cutout, height	166 mm	221 mm	221 mm
mounting depth	39.4 mm	54.9 mm	54.9 mm
Weights			
Weight (without packaging)	1 130 g	1 710 g	1 710 g

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Overview



- Ideal entry-level series of 3.8" to 15" for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS485/422
- Faster commissioning thanks to integrated diagnostics viewer and IP setting for SIMATIC S7-1200 and S7-1500 PLCs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS HMI Basic Panels	
SIPLUS HMI KP300 Basic mono PN with conformal coating, ambient temperature -25... +60°C, based on 6AV6647-0AH11-3AX1	**6AG1647-0AH11-2AX1**
Accessories	See catalog ST 80 / ST PC

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Technical specifications

Article number	6AG1647-0AH11-2AX1 SIPLUS HMI KP300 Basic mono PN
General information	
Product type designation	KP300 Basic mono PN
Display	
Design of display	FSTN
Screen diagonal	3.6 in
Number of colors	4; backlit display only (white, red, green, yellow)
Resolution (pixels)	
• Horizontal image resolution	240 pixel
• Vertical image resolution	80 pixel
Backlighting	
• MTBF backlighting (at 25 °C)	50 000 h
Control elements	
Keyboard	
• Function keys	
- Number of function keys	10
Touch operation	
• Design as touch screen	No; without
Installation type/mounting	
Rack mounting	No
Wall mounting/direct mounting	No
Mounting in portrait format possible	No
Supply voltage	
Rated value (DC)	24 V
Storage	
Memory available for user data	1 Mbyte
Type of output	
Acoustics	
• Buzzer	No
Time of day	
Clock	
• Software clock	Yes
• retentive	No
• synchronizable	Yes
Interfaces	
Number of industrial Ethernet interfaces	1
Number of RS 485 interfaces	0
Number of USB interfaces	0
Number of SD card slots	0
Protocols	
PROFINET	Yes
IRT	No
PROFIBUS	No
MPI	No
Redundancy mode	
- Media redundancy	
- MRP	No
Degree and class of protection	
IP (at the front)	IP65
IP (rear)	IP20
NEMA (front)	
• Enclosure Type 4x at the front	Yes
Ambient conditions	
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m

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Technical specifications (continued)

Article number	6AG1647-0AH11-2AX1 SIPLUS HMI KP300 Basic mono PN
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning when condensation present), horizontal at vertical mounting position
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Languages	
Online languages	
• Number of online/runtime languages	5
Functionality under WinCC (TIA Portal)	
Applications/options	none
• Web browser	No
• SIMATIC WinCC Sm@rtServer	No
Task planner	
• time-controlled	No
• task-controlled	Yes
Message system	
• Bit messages	Yes
- Number of bit messages	200
• Analog messages	Yes
- Number of analog messages	15
• Message buffer	
- Number of entries	256
- Circulating buffer	Yes
- retentive	Yes
Recipe management	
• Number of recipes	5
• Size of internal recipe memory	40 kbyte

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Technical specifications (continued)

Article number	6AG1647-0AH11-2AX1 SIPLUS HMI KP300 Basic mono PN
• Recipe memory expandable	No
Variables	
• Number of variables per device	250
• Number of variables per screen	30
Images	
• Number of configurable images	50
Archiving	
• Number of archives per device	0
Security	
• Number of user groups	50
• Number of users	50
• SIMATIC Logon	No
Transfer (upload/download)	
• MPI/PROFIBUS DP	No
• Ethernet	Yes
Process coupling	
• S7-1200	Yes
• S7-1500	Yes
• S7-200	Yes
• S7-300/400	Yes
• LOGO!	Yes
• WinAC	Yes
• SIMOTION	No
• Allen Bradley (EtherNet/IP)	Yes
• Allen Bradley (DF1)	No
• Mitsubishi (MC TCP/IP)	Yes
• Mitsubishi (FX)	No
• OMRON (FINS TCP)	No
• OMRON (Host Link)	No
• Modicon (Modbus TCP/IP)	Yes
• Modicon (Modbus RTU)	No
Peripherals/Options	
Printer	No
SIMATIC HMI MM memory card: Multi Media Card	No
SIMATIC HMI SD memory card: Secure Digital memory card	No
USB memory	No
Mechanics/material	
Enclosure material (front)	
• plastic	Yes
• Aluminum	No
• Stainless steel	No
Dimensions	
Width of the housing front	165 mm
Height of housing front	97 mm
Mounting cutout, width	149 mm
Mounting cutout, height	82 mm
mounting depth	30 mm
Weights	
Weight (without packaging)	0.25 kg

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Overview



SIPLUS HMI Unified Comfort Panels - standard devices

SIPLUS HMI Unified Comfort Panels consist of six different devices with varying display sizes.
All devices come with the same number of hardware interfaces and the same functionality – just select the perfect device for your needs based on the screen size.

Each Unified Comfort Panel is available in the standard design with Siemens and SIMATIC HMI branding and a silver-colored aluminum frame.

All Unified Comfort Panels come with integrated Edge functionality.

SIMATIC WinCC Unified contains visualization, communication, alarms/warnings, report creation, administration of parameter sets, archiving of user administration.
Furthermore, a WinCC Unified Client Operate (V17 or higher) for remote operator control and monitoring, and a WinCC Unified Client Monitor (V18 or higher) for monitoring only are also included.
Additional clients can be enabled with a license. Up to three client licenses can be used.

Client access is based on native web technologies such as HTML5, SVG and JavaScript. The visualization can be accessed via any modern web browser – without the need for additional installation.

Siemens Industrial Edge can be used in two different ways:

- Device-managed Edge
- Centrally-managed Edge (planned)

SIMATIC HMI Unified Comfort Panels can also be ordered with a neutral design.

Note:

The technical specifications of the neutral design devices correspond to the technical specifications of the devices with standard design.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS HMI Unified Comfort Panels	
Standard design	
SIPLUS HMI MTP700 Unified Comfort, with conformal coating	**6AG1128-3GB06-4AX1**
SIMATIC HMI MTP1000 Unified Comfort Panel, with conformal coating	**6AG1128-3KB06-4AX1**
SIMATIC HMI MTP1200 Unified Comfort Panel, with conformal coating	**6AG1128-3MB06-4AX1**
Accessories	
EDGE Runtime for SIMATIC Unified Comfort Runtime software, single license, license key for download, without software and documentation, Class A, email address required for delivery	**6AV2170-2BA00-0AA0**
Accessories	See catalog ST 80 / ST PC

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Technical specifications

Article number	6AG1128-3GB06-4AX1 SIPLUS HMI MTP700 Unified Comfort	6AG1128-3KB06-4AX1 SIPLUS HMI MTP1000 Unified Comfort	6AG1128-3MB06-4AX1 SIPLUS HMI MTP1200 Unified Comfort
General information			
Product type designation	MTP700 Unified Comfort	MTP1000 Unified Comfort	MTP1200 Unified Comfort
Display			
Design of display	TFT	TFT	TFT
Screen diagonal	7 in	10.1 in	12.1 in
Number of colors	16 777 216	16 777 216	16 777 216
Resolution (pixels)			
• Horizontal image resolution	800 pixel	1 280 pixel	1 280 pixel
• Vertical image resolution	480 pixel	800 pixel	800 pixel
Backlighting			
• MTBF backlighting (at 25 °C)	50 000 h; At 25°C	50 000 h; At 25°C	50 000 h; At 25°C
Control elements			
Touch operation			
• Design as touch screen	Yes	Yes	Yes
• Design as multi-touch screen	Yes	Yes	Yes
Installation type/mounting			
Mounting in portrait format possible	Yes	Yes	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Type of output			
Acoustics			
• Speaker	No	No	No
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
• retentive	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks
• synchronizable	Yes	Yes	Yes
Interfaces			
Number of industrial Ethernet interfaces	2; 2 ports (switch) + independent port	2; 2 ports (switch) + independent port	2; 2 ports (switch) + independent port
Number of RS 485 interfaces	1; RS 422 / 485 combined	1; RS 422 / 485 combined	1; RS 422 / 485 combined
Number of USB interfaces	4; USB 3.1 Gen. 1 (type A)	4; USB 3.1 Gen. 1 (type A)	4; USB 3.1 Gen. 1 (type A)
Number of SD card slots	2	2	2
Industrial Ethernet			
• Number of ports of the integrated switch	2	2	2
Protocols			
PROFINET	Yes	Yes	Yes
Redundancy mode			
- Media redundancy			
- MRP	Yes	Yes	Yes
Degree and class of protection			
IP (at the front)	IP65	IP65	IP65
IP (rear)	IP20	IP20	IP20
NEMA (front)			
• Enclosure Type 4x at the front	Yes	Yes	Yes
• Enclosure Type 12 at the front	Yes	Yes	Yes
Ambient conditions			
Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
Ambient temperature during operation			
- Operation (vertical installation)			
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level			

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Technical specifications (continued)

Article number	6AG1128-3GB06-4AX1 SIPLUS HMI MTP700 Unified Comfort	6AG1128-3KB06-4AX1 SIPLUS HMI MTP1000 Unified Comfort	6AG1128-3MB06-4AX1 SIPLUS HMI MTP1200 Unified Comfort
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning when condensation present), horizontal at vertical mounting position	100 %; RH incl. condensation/frost (no commissioning when condensation present), horizontal at vertical mounting position	100 %; RH incl. condensation/frost (no commissioning when condensation present), horizontal at vertical mounting position
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Configuration			
Configuration software			
• WinCC Unified Comfort Engineering (TIA Portal)	Yes	Yes	Yes
• WinCC Unified PC Engineering (TIA Portal)	Yes	Yes	Yes
Languages			
Online languages			
• Number of online/runtime languages	32	32	32

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Technical specifications (continued)

Article number	6AG1128-3GB06-4AX1 SIPLUS HMI MTP700 Unified Comfort	6AG1128-3KB06-4AX1 SIPLUS HMI MTP1000 Unified Comfort	6AG1128-3MB06-4AX1 SIPLUS HMI MTP1200 Unified Comfort
Functionality under WinCC Unified			
Applications/options			
• Writer	Yes	Yes	Yes
• Calc	Yes		
• Web browser	Yes	Yes	Yes
• PDF Viewer	Yes		
• Media Player	Yes	Yes	Yes
• SIMATIC WinCC Sm@rtServer	Yes	Yes	Yes
• SIMATIC WinCC Audit	No	Yes	No
• Unified Collaboration	Yes	Yes	Yes
Number of Visual Basic Scripts	No		
JavaScript	Yes	Yes	Yes
Task planner			
• time-controlled	Yes	Yes	Yes
• task-controlled	Yes	Yes	Yes
Message system			
• Bit messages			
- Number of bit messages	9 000	9 000	9 000
• Analog messages			
- Number of analog messages	300	300	300
• Message buffer	Yes; Configured as alarm archive	Yes; Configured as alarm archive	Yes; Configured as alarm archive
- Circulating buffer	Yes	Yes	Yes
- retentive	Yes	Yes	Yes
Parameter set management (recipes)			
• Number of parameter set types	750	750	750
• Size of internal parameter set memory	12 Mbyte	12 Mbyte	12 Mbyte
• Parameter set memory expandable	Yes	Yes	Yes
Variables			
• Number of variables per device	8 000	8 000	8 000
• Number of variables per screen	600	600	600
Images			
• Number of configurable images	1 200	1 200	1 200
Archiving			
• Number of archives per device	50	50	50
Security			
• Number of roles	50	50	50
• Number of users	200	200	200
• Central user administration	Yes; as of WinCC V17	Yes; as of WinCC V17	Yes; as of WinCC V17
Transfer (upload/download)			
• Ethernet	Yes	Yes	Yes
Process coupling			
• S7-1200	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes
• S7-200	No	No	No
• S7-300/400	Yes	Yes	Yes
• Number of S7 connections	16	16	16
• LOGO!	Yes; as of WinCC Unified V20	Yes; as of WinCC Unified V20	Yes; as of WinCC Unified V20
• SIMOTION	No	No	No
• OPC UA Client	Yes	Yes	Yes
• OPC UA Server	Yes	Yes	Yes
• Software Controller/Open Controller	Yes	Yes	Yes
Peripherals/Options			
Peripherals	Printer, barcode reader	Printer, barcode reader	Printer, barcode reader
Printer	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1128-3GB06-4AX1 SIPLUS HMI MTP700 Unified Comfort	6AG1128-3KB06-4AX1 SIPLUS HMI MTP1000 Unified Comfort	6AG1128-3MB06-4AX1 SIPLUS HMI MTP1200 Unified Comfort
SIMATIC HMI MM memory card: Multi Media Card	No	No	No
SIMATIC HMI SD memory card: Secure Digital memory card	Yes	Yes	Yes
USB memory	Yes	Yes	Yes
Network camera	No	No	No
Mechanics/material			
Enclosure material (front)			
• Aluminum	Yes	Yes	Yes
Dimensions			
Width of the housing front	214 mm	280 mm	326 mm
Height of housing front	158 mm	205 mm	237 mm
Mounting cutout, width	198.3 mm	264.6 mm	310.6 mm
Mounting cutout, height	142 mm	189.1 mm	221.1 mm
mounting depth	63.6 mm	63.6 mm	64 mm
Weights			
Weight (without packaging)	1.4 kg	2.1 kg	2.8 kg

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Overview



- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Easy project transfer via standard cable (standard Ethernet cable, standard USB cable)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2x PROFINET with integrated switch for 7" models or larger; plus 1 additional PROFINET with Gigabit support for 15" models or larger
- All variants can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- Key-operated devices with stamped keys for optimum tactile feedback
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS HMI Comfort Panels, Touch	
SIPLUS HMI TP700 Comfort	6AG1124-0GC01-4AX0
SIPLUS HMI TP900 Comfort	6AG1124-0JC01-4AX0
SIPLUS HMI TP1200 Comfort	6AG1124-0MC01-4AX0
SIPLUS HMI TP1500 Comfort	6AG1124-0QC02-4AX1
SIPLUS HMI TP1900 Comfort	6AG1124-0UC02-4AX1
SIPLUS HMI TP2200 Comfort	6AG1124-0XC02-4AX1
SIPLUS HMI Comfort Panels, Keys	
SIPLUS HMI KP700 Comfort	6AG1124-1GC01-4AX0
SIPLUS HMI KP900 Comfort	6AG1124-1JC01-4AX0
SIPLUS HMI KP1200 Comfort	6AG1124-1MC01-4AX0
SIPLUS HMI KP1500 Comfort	6AG1124-1QC02-4AX1
Accessories	See catalog ST 80 / ST PC

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Technical specifications

Article number	6AG1124-1GC01-4AX0 SIPLUS HMI KP700 COMFORT	6AG1124-1JC01-4AX0 SIPLUS HMI KP900 COMFORT	6AG1124-1MC01-4AX0 SIPLUS HMI KP1200 COMFORT	6AG1124-1QC02-4AX1 SIPLUS HMI KP1500 Comfort
General information				
Product type designation	KP700 Comfort	KP900 Comfort	KP1200 Comfort	KP1500 Comfort
Display				
Design of display	TFT	TFT	TFT	TFT
Screen diagonal	7 in	9 in	12.1 in	15.4 in
Number of colors	16 777 216	16 777 216	16 777 216	16 777 216
Resolution (pixels)				
• Horizontal image resolution	800 pixel	800 pixel	1 280 pixel	1 280 pixel
• Vertical image resolution	480 pixel	480 pixel	800 pixel	800 pixel
Backlighting				
• MTBF backlighting (at 25 °C)	80 000 h	80 000 h	80 000 h	80 000 h
Control elements				
Keyboard				
• Function keys				
- Number of function keys	24	26	34	36
Touch operation				
• Design as touch screen	No; without	No; without	No; without	No; without
Installation type/mounting				
Wall mounting/direct mounting	No	No	No	
Mounting in portrait format possible	No	No	No	No
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Storage				
Memory available for user data	12 Mbyte	12 Mbyte	12 Mbyte	24 Mbyte
Type of output				
Acoustics				
• Speaker	Yes	Yes	Yes	Yes
Time of day				
Clock				
• Hardware clock (real-time)	Yes	Yes	Yes	Yes
• retentive	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks	Yes; Back-up duration typically 6 weeks
• synchronizable	Yes	Yes	Yes	Yes
Interfaces				
Number of industrial Ethernet interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)	2; 2 ports (switch) + independent port
Number of RS 485 interfaces	1; RS 422 / 485 combined	1; RS 422 / 485 combined	1; RS 422 / 485 combined	1; RS 422 / 485 combined
Number of USB interfaces	2; USB 2.0	2; USB 2.0	2; USB 2.0	2; USB 2.0
• USB Mini B	1; 5-pole	1; 5-pole	1; 5-pole	
Number of SD card slots	2	2	2	2
Industrial Ethernet				
• Number of ports of the integrated switch	2	2	2	2
Protocols				
PROFINET	Yes	Yes	Yes	Yes
IRT	Yes; As of WinCC V12	Yes; As of WinCC V12	Yes; As of WinCC V12	Yes
PROFIBUS	Yes	Yes	Yes	Yes
MPI	Yes	Yes	Yes	Yes
Redundancy mode				
- Media redundancy				
- MRP	Yes; As of WinCC V12	Yes; As of WinCC V12	Yes; As of WinCC V12	Yes
Degree and class of protection				
IP (at the front)	IP65	IP65	IP65	IP65
IP (rear)	IP20	IP20	IP20	IP20
NEMA (front)				
• Enclosure Type 4x at the front	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1124-1GC01-4AX0 SIPLUS HMI KP700 COMFORT	6AG1124-1JC01-4AX0 SIPLUS HMI KP900 COMFORT	6AG1124-1MC01-4AX0 SIPLUS HMI KP1200 COMFORT	6AG1124-1QC02-4AX1 SIPLUS HMI KP1500 Comfort
Ambient conditions				
Suited for indoor use				Yes
Suited for outdoor use				No
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection

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Technical specifications (continued)

Article number	6AG1124-1GC01-4AX0 SIPLUS HMI KP700 COMFORT	6AG1124-1JC01-4AX0 SIPLUS HMI KP900 COMFORT	6AG1124-1MC01-4AX0 SIPLUS HMI KP1200 COMFORT	6AG1124-1QC02-4AX1 SIPLUS HMI KP1500 Comfort
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Languages				
Online languages				
• Number of online/runtime languages	32	32	32	32
Functionality under WinCC (TIA Portal)				
Applications/options				
• Web browser	Yes	Yes	Yes	Yes
• Pocket Word	Yes	Yes	Yes	Yes
• Pocket Excel	Yes	Yes	Yes	Yes
• PDF Viewer	Yes	Yes	Yes	Yes
• Media Player	Yes	Yes	Yes	Yes
• SIMATIC WinCC Sm@rtServer	Yes	Yes	Yes	Yes
• SIMATIC WinCC Audit	Yes	Yes	Yes	Yes
Number of Visual Basic Scripts	Yes	Yes	Yes	Yes
Task planner				
• time-controlled	Yes	Yes	Yes	Yes
• task-controlled	Yes	Yes	Yes	Yes
Message system				
• Bit messages	Yes		Yes	
- Number of bit messages	4 000	4 000	4 000	6 000
• Analog messages	Yes		Yes	
- Number of analog messages	200	200	200	200
• Message buffer				
- Number of entries	1 024	1 024	1 024	1 024
- Circulating buffer	Yes	Yes	Yes	Yes
- retentive	Yes	Yes	Yes	Yes
Recipe management				
• Number of recipes	300	300	300	500
• Size of internal recipe memory	2 Mbyte	2 Mbyte	2 Mbyte	4 Mbyte
• Recipe memory expandable	Yes	Yes	Yes	Yes
Variables				
• Number of variables per device	2 048	2 048	2 048	4 096
• Number of variables per screen	400	400	400	400
Images				
• Number of configurable images	500	500	500	750
Archiving				
• Number of archives per device	50	50	50	50
Security				
• Number of user groups	50	50	50	50
• Number of users	50	50	50	50
• SIMATIC Logon	Yes	Yes	Yes	Yes
Logging through printer				
• Alarms	Yes	Yes	Yes	Yes
• Report (shift log)	Yes	Yes	Yes	Yes
• Hardcopy	Yes	Yes	Yes	Yes
• Electronic print to file	Yes; PDF, HTML	Yes; PDF, HTML	Yes; PDF, HTML	Yes; PDF, HTML
Transfer (upload/download)				
• MPI/PROFIBUS DP	Yes	Yes	Yes	Yes
• Ethernet	Yes	Yes	Yes	Yes
Process coupling				

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Technical specifications (continued)

Article number	6AG1124-1GC01-4AX0 SIPLUS HMI KP700 COMFORT	6AG1124-1JC01-4AX0 SIPLUS HMI KP900 COMFORT	6AG1124-1MC01-4AX0 SIPLUS HMI KP1200 COMFORT	6AG1124-1QC02-4AX1 SIPLUS HMI KP1500 Comfort
• S7-1200	Yes	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes	Yes
• WinAC	Yes	Yes	Yes	Yes
• SIMOTION	Yes	Yes	Yes	Yes
• Allen Bradley (EtherNet/IP)	Yes	Yes	Yes	Yes
• Allen Bradley (DF1)	Yes	Yes	Yes	Yes
• Mitsubishi (MC TCP/IP)	Yes	Yes	Yes	Yes
• Mitsubishi (FX)	Yes	Yes	Yes	Yes
• OMRON (FINS TCP)	No	No	No	No
• OMRON (Host Link)	Yes	Yes	Yes	Yes
• Modicon (Modbus TCP/IP)	Yes	Yes	Yes	Yes
• Modicon (Modbus RTU)	Yes	Yes	Yes	Yes
• OPC UA Client	Yes	Yes	Yes	Yes
• OPC UA Server	Yes	Yes	Yes	Yes
Peripherals/Options				
Printer	Yes	Yes	Yes	Yes
SIMATIC HMI MM memory card: Multi Media Card	Yes; Up to 128 MB	Yes; Up to 128 MB	Yes; Up to 128 MB	Yes; Up to 128 MB
SIMATIC HMI SD memory card: Secure Digital memory card	Yes; Up to 2 GB	Yes; Up to 2 GB	Yes; Up to 2 GB	Yes; Up to 2 GB
USB memory	Yes	Yes	Yes	Yes
Network camera	Yes	Yes	Yes	Yes
Mechanics/material				
Enclosure material (front)				
• plastic	No	No	No	No
• Aluminum	Yes	Yes	Yes	Yes
• Stainless steel	No	No	No	No
Dimensions				
Width of the housing front	308 mm	361.2 mm	454 mm	483 mm
Height of housing front	204 mm	230 mm	289 mm	310 mm
Mounting cutout, width	282 mm	338 mm	434 mm	450 mm
Mounting cutout, height	178 mm	206 mm	269 mm	291 mm
mounting depth	63 mm	63 mm	64.6 mm	75 mm
Weights				
Weight (without packaging)	2.2 kg	2.7 kg	4.4 kg	4.7 kg

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Overview



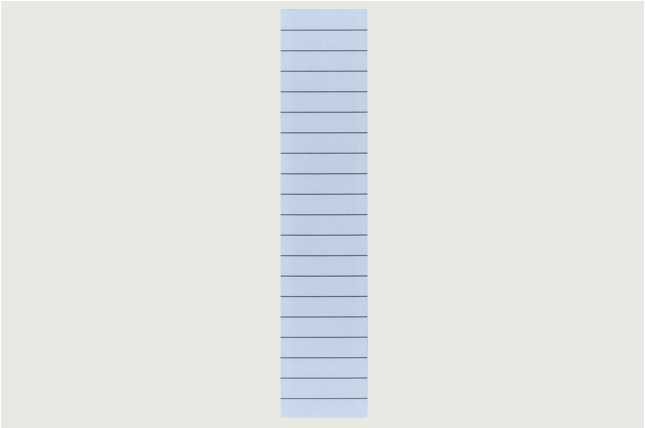
- Aluminum mounting rail for mounting the SIMATIC S7-1500 or ET 200MP
- With integrated DIN rail for snapping on a wide range of standard components
- Attachment of modules with a single screw
- Installation by screwing to the control cabinet wall
- Entire length of rail can be used
- Can also be mounted on low or flat DIN rails, e.g. in control cabinets and terminals boxes, using DIN rail adapter

Selection and ordering data

SIMATIC S7-1500 mounting rail	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) **Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays**	**6ES7590-1AF30-0AA0**
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
SIMATIC S7-1500, DIN rail adapter For adapting S7-1500 mounting rails on low or flat DIN rails, as preassembled in control cabinets and terminal boxes, for example. An adapter must be placed every 25 cm. Including mounting hardware. 10 units per packing unit	**6ES7590-6AA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Overview



- Film sheets for the application-specific, automatic labeling of SIMATIC S7-1500 I/O modules using standard laser printers
- Direct printing possible from the TIA Portal
  - No double entry of symbols and/or addresses
  - Saves time and avoids typing errors
- Plain color films, tear-resistant, dirt-repellent
- Simple handling:
  - Perforated labeling sheets in DIN A4 format for easy separation of the labeling strips.
  - Detached strips can be inserted directly into the I/O modules.
- Different colors to differentiate module types; yellow reserved for fail-safe systems

Selection and ordering data

DIN A4 labeling sheet	
SIMATIC S7-1500, labeling sheets for 35 mm wide S7-1500 modules Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 10 strips per packing unit sufficient for 100 modules	**6ES7592-2AX00-0AA0**
SIMATIC S7-1500, labeling sheets for 25 mm wide S7-1500 modules and compact CPUs Color: AL gray; material: film, perforated; suitable for printing with commercially available laser printers; 10 sheets of 20 strips per packing unit sufficient for 200 modules	**6ES7592-1AX00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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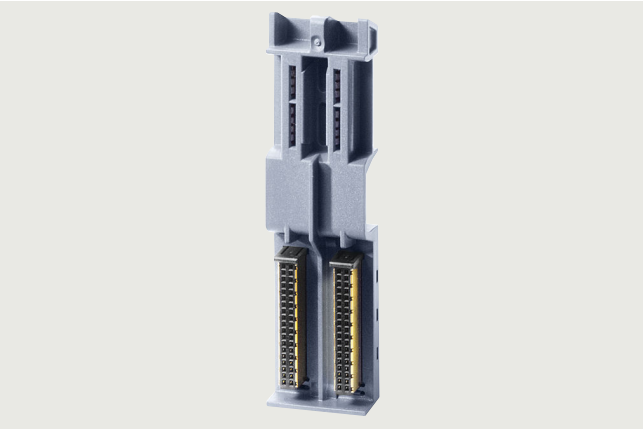
Overview

Front doors



- Versions:
  - Universal front doors for digital and analog I/O modules
  - Universal front doors for the interface module IM155-5 PN ST
- Included in the scope of supply of the respective modules. Can be ordered as a spare part in a set consisting of five universal (unlabeled) front doors.
- Front doors for I/O modules: Universal labeling sheets and cabling diagrams are included. Cabling diagrams can be detached from preperforated sheets and inserted inside the door.

U connector



- To interconnect the modules (self-assembling backplane bus)
- Implementation of a rugged, interference-free station setup through
  - Consistent separation of supply voltage of modules and data signals
  - Fully shielded, gold-plated contacts for the data bus
- Included in the scope of supply of each module. Available as spare part in sets of 5.

Overview (continued)

Shielding



- Components for implementing the integrated S7-1500 shielding concept:
  - 24 V DC infeed element for supplying the analog module: strict separation of infeed and analog signals ensures high EMC stability.
  - Shield bracket for insertion in the front connector: allows a low-impedance connection and optimally dissipates interference.
  - Universal shield terminal: connects the cable shield with the shield bracket and is simultaneously used for mechanical fixing.
- Included in the scope of supply of the analog modules. Available as a spare part in two versions:
  - Shielding set, comprising infeed element, shield bracket, and shield terminal (pack of 5 units each)
  - Individual shield terminals (pack of 20)
- No tool required for assembly/disassembly

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Selection and ordering data

SIMATIC ET 200MP, spare part front door For IM 155-5 (6ES7155-5AA00-0AB0) 5 units per packing unit	**6ES7528-0AA70-7AA0**
Universal front door for I/O modules	
SIMATIC S7-1500, spare part front door for 35 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram 5 units per packing unit	**6ES7528-0AA00-7AA0**
SIMATIC S7-1500, spare part front door for 25 mm wide I/O modules Consisting of: * front door (unlasered), * labeling strips (front) * cabling diagram 5 units per packing unit	**6ES7528-0AA00-0AA0**
SIMATIC S7-1500, spare part U-type connector for connecting I/O modules Self-assembling backplane bus 5 units per packing unit	**6ES7590-0AA00-0AA0**
Shielding set I/O	
SIMATIC S7-1500, spare part, shielding set Consisting of: * shield terminal, * shielding bracket, * 24 V DC infeed element with screw-type connection system, suitable for analog and technology modules of the S7-1500, suitable for all front connectors for 35 mm wide modules 5 units per packing unit	**6ES7590-5CA00-0AA0**
SIMATIC S7-1500, spare part, shielding set Consisting of: * 4x shield terminal, * 4x shielding bracket, * 4x 24 V DC infeed element with push-in technology, suitable for analog modules, technology modules and compact CPU of the S7-1500, suitable for all front connectors for 25 mm wide modules	**6ES7590-5CA10-0XA0**
SIMATIC S7-1500, spare part shield terminal Suitable for analog modules and technology modules with 35 mm width without shielding bracket and without 24 V DC infeed element 10 units per packing unit	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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6/2 **Overview**
6/2 S7-400

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Overview

SIMATIC S7-400:
The powerful controller for system solutions in the manufacturing and process industries



Within the controller family, the SIMATIC S7-400 is designed for system solutions in the manufacturing and process automation industry.

- The modularly designed S7-400H can be flexibly adapted to your requirements. The redundant configuration further increases system availability.
- An additional protective coating (conformal coating) on the circuit board optimally protects the modules against external influences and makes them durable.
- The S7-400H stands out thanks to its long-term availability.
- Safety engineering, SIMATIC F-systems and standard automation can be integrated into a single automation system.
- The configuration of the distributed I/O of the S7-400 can be modified during operation. In addition signal modules can be removed and inserted while live (hot swapping). This makes it very easy to expand the system or replace modules in the event of a fault.
- Storage of the entire project data, including symbols and comments, on the CPU simplifies service and maintenance calls.

SIMATIC S7-400, CPU	412-5H[4)]	414-5H[4)]	416-5H[4)]	417-5H[4)]
Work memory	1 MB	4 MB	16 MB	32 MB
Processing times (ns)				
Bit/word/fixed point/floating point	31.25/31.25/31.25/62.5	18.75/18.75/18.75/37.5	12.5/12.5/12.5/25	7.5/7.5/7.5/15
Timers/counters	2048/2048	2048/2048	2048/2048	2048/2048
Address ranges				
Digital inputs/outputs	65536 each	65536 each	131072 each	131072 each
Analog inputs/outputs	4096 each	4096 each	8192 each	8192 each
DP interfaces				
Number of MPI/DP interfaces	1	1	1	1
Number of DP interfaces	1	1	1	1
Number of DP slaves per MPI/DP	32	32	32	32
Number of DP slaves per DP	64	96	125	125
Plug-in interface modules	—	—	—	—
Data set gateway	●	●	●	●
PN interfaces				
Number of PN interfaces	1 (2 ports)	1 (2 ports)	1 (2 ports)	1 (2 ports)
PROFINET IO	●	●	●	●
PROFINET with IRT	—	—	—	—
PROFINET CBA	—	—	—	—
TCP/IP	●	●	●	●
UDP	●	●	●	●
Web server	—	—	—	—
ISO-on-TCP (RFC 1006)	●	●	●	●
Mounting dimensions W x H x D (mm)	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219

— = cannot be used/not available
● = can be used/available
4) also as SIPLUS extreme component for corrosive atmosphere/condensation

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Overview (continued)



- The S7-400 is especially suitable for data-intensive tasks in the process industry. High processing speeds and deterministic response times guarantee short machine cycle times on high-speed machines in the manufacturing industry. The high-speed backplane bus of S7-400 ensures efficient linking of central I/O modules.
- The S7-400 is used preferably to coordinate complete plants and to control lower-level devices/stations; this is guaranteed by the high communication power and the integral interfaces.
- The performance is scalable thanks to a graded range of CPUs; Interfaces for the PROFIBUS/PROFINET connection ensure optimal connectivity.
- To further increase ruggedness and durability in the harsh everyday industrial environment, the S7-400 has a "G3" conformal coating.

SIMATIC S7-400, CPU	412-1 / 412-2	412-2 PN[4]	414-2 / 414-3	414-3 PN/DP[4]	416-2 / 416-3[4]	416-3 PN/DP[4]	417-4[4]
Work memory	512 KB/ 1[1] MB	1 MB	2/4[2] MB	4 MB	8/16[3] MB	16 MB	32 MB
Processing times (ns)							
Bit/word/fixed point/floating point	31.25/31.25/31.25/6-2.5	31.25/31.25/31.25/6-2.5	18.75/18.75/18.75/3-7.5	18.75/18.75/18.75/3-7.5	12.5/12.5/12.5/25	12.5/12.5/12.5/25	7.5/7.5/7.5/15
Timers/counters	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048
Address ranges							
Digital inputs/outputs	32768 each	32768 each	65536 each	65536 each	131072 each	131072 each	131072 each
Analog inputs/outputs	2048 each	2048 each	4096 each	4096 each	8192 each	8192 each	8192 each
DP interfaces							
Number of MPI/DP interfaces	1	1	1	1	1	1	1
Number of DP interfaces	— / 1[1]	—	1	—	1	1	1
Number of DP slaves per MPI/DP	32	32	32	32	32	32	32
Number of DP slaves per DP	64	—	96 each	125 each	125 each	125 each	125 each
Plug-in interface modules	—	—	— / 1 x DP[2]	1 x DP	— / 1 x DP[3]	1 x DP	2 x DP
Data set gateway	●	●	●	●	●	●	●
PN interfaces							
Number of PN interfaces	—	1 (2 ports)	—	1 (2 ports)	—	1 (2 ports)	—
PROFINET IO	—	●	—	●	—	●	—
PROFINET with IRT	—	●	—	●	—	●	—
PROFINET CBA	—	●	—	●	—	●	—
TCP/IP	—	●	—	●	—	●	—
UDP	—	●	—	●	—	●	—
Web server	—	●	—	●	—	●	—
ISO-on-TCP (RFC 1006)	—	●	—	●	—	●	—
Mounting dimensions W x H x D (mm)	25 x 290 x 219	25 x 290 x 219	25 x 290 x 219 50 x 290 x 219[2]	50 x 290 x 219	25 x 290 x 219 50 x 290 x 219[3]	50 x 290 x 219	50 x 290 x 219

— = cannot be used/not available
● = can be used/available
1) CPU 412-2
2) CPU 414-3
3) CPU 416-3
4) also as SIPLUS extreme component for corrosive atmosphere/condensation

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Overview (continued)



- Safety engineering and standard automation can be integrated into a single S7-400.
- For demanding, safety-oriented automation in mechanical engineering with S7 Distributed Safety.
- Many S7-400 components are also available in a SIPLUS extreme version for extreme environmental conditions, e.g. for use where there is a corrosive atmosphere/condensation. For more detailed information, see under this link.

SIMATIC S7-400, CPU	414F-3 PN/DP	416F-2	416F-3 PN/DP
Work memory	4 MB	8 MB	16 MB
Processing times (ns)			
Bit/word/fixed point/floating point	18.75/18.75/18.75/37.5	12.5/12.5/12.5/25	12.5/12.5/12.5/25
Timers/counters	2048/2048	2048/2048	2048/2048
Address ranges			
Digital inputs/outputs	65536 each	131072 each	131072 each
Analog inputs/outputs	4096 each	8192 each	8192 each
DP interfaces			
Number of MPI/DP interfaces	1	1	1
Number of DP interfaces	1	1	1
Number of DP slaves per MPI/DP	32	32	32
Number of DP slaves per DP	125 each	125	125 each
Plug-in interface modules	1 x DP	—	1 x DP
Data set gateway	●	●	●
PN interfaces			
Number of PN interfaces	1 (2 ports)	—	1 (2 ports)
PROFINET IO	●	—	●
PROFINET with IRT	●	—	●
PROFINET CBA	●	—	●
TCP/IP	●	—	●
UDP	●	—	●
Web server	●	—	●
ISO-on-TCP (RFC 1006)	●	—	●
Mounting dimensions W x H x D (mm)	50 x 290 x 219	25 x 290 x 219	50 x 290 x 219

— = cannot be used/not available
● = can be used/available

For more information, refer to this link.
Detailed information on SIMATIC S7-400, see under this link in SiePortal.

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7/2	**based on ET 200SP**
7/2	Standard CPUs
7/2	CPU 1510SP-1 PN
7/8	CPU 1512SP-1 PN
7/14	CPU 1514SP-2 PN
7/21	SIPLUS standard CPUs
7/21	SIPLUS CPU 1510SP-1 PN
7/27	SIPLUS CPU 1512SP-1 PN
7/33	Fail-safe CPUs
7/33	CPU 1510SP F-1 PN
7/40	CPU 1512SP F-1 PN
7/47	CPU 1514SP F-2 PN
7/55	SIPLUS fail-safe CPUs
7/55	SIPLUS CPU 1510SP F-1 PN
7/61	SIPLUS CPU 1512SP F-1 PN
7/68	Technology CPUs
7/68	CPU 1514SP T-2 PN
7/75	CPU 1514SP TF-2 PN
7/82	ET 200SP Open Controllers
7/82	Standard CPUs
7/82	CPU 1515SP PC2
7/88	Fail-safe CPUs
7/88	CPU 1515SP PC2 F
7/95	Technology-CPUs
7/95	CPU 1515SP PC2 T
7/102	CPU 1515SP PC2 TF
7/109	SIPLUS ET 200SP Open Controllers
7/109	SIPLUS standard CPUs
7/109	SIPLUS CPU 1515SP PC2
7/115	SIPLUS fail-safe CPUs
7/115	SIPLUS CPU 1515SP PC2 F
7/121	**based on ET 200pro**
7/121	Standard CPUs
7/121	CPU 1513pro-2 PN
7/128	CPU 1516pro-2 PN
7/135	Fail-safe CPUs
7/135	IM 154-8 F PN/DP CPU
7/141	CPU 1513pro F-2 PN
7/148	CPU 1516pro F-2 PN

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Overview



- CPU 1510SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 I/O devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options:
  PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.
The BusAdapter is not included in scope of supply and is to be ordered separately.

Selection and ordering data

SIMATIC DP, CPU 1510SP-1 PN for ET 200SP Central processing unit with 200 KB work memory for program and 1 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2 Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!	**6ES7510-1DK03-0AB0**
Accessories	
SIMATIC DP, CM PROFIBUS DP For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device	**6ES7545-5DA00-0AB0**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
DIN rail 35 mm	
SIMATIC, DIN rail 35 mm Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
SIMATIC, DIN rail 35 mm Length 2 m	**6ES5710-8MA41**
SIMATIC S7-1500, grounding screw For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail, 20 units per packing unit	**6ES7590-5AA00-0AA0**
SIMATIC ET 200SP, BA 2xRJ45 BusAdapter 2 RJ45 sockets	**6ES7193-6AR00-0AA0**
SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connection	**6ES7193-6AF00-0AA0**
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	**6ES7193-6AP00-0AA0**
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	**6ES7193-6AP20-0AA0**
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	**6ES7193-6AP40-0AA0**
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**
Labeling strips	
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	**6ES7193-6LR10-0AA0**
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	**6ES7193-6LR10-0AG0**
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AA0**

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Selection and ordering data (continued)

SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AG0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 1 unit.	**6GK1901-1BB20-2AA0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 10 units.	**6GK1901-1BB20-2AB0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 50 units.	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under this link.	

Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery. Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XE01-8YE2**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
Spare parts	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit	**6ES7193-4JB00-0AA0**
SIMATIC ET 200SP, spare part 5 covers For BusAdapter interface of the ET 200SP CPU	**6ES7591-3AA00-0AA0**
SIMATIC ET 200SP, spare part server module For ET 200SP	**6ES7193-6PA00-0AA0**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
General information	
Product type designation	CPU 1510SP-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7510-1DJ01-0AB0
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	200 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes

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Technical specifications (continued)

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- CPU 1512SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 I/O devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.
BusAdapter is not included in scope of delivery and is to be ordered separately.

Selection and ordering data

SIMATIC DP, CPU 1512SP-1 PN for ET 200SP Central processing unit with 400 KB work memory for program and 2 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2 Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!	**6ES7512-1DM03-0AB0**
Accessories	
SIMATIC DP, CM PROFIBUS DP for ET 200SP CPU module with PROFIBUS DP interface (9-pin SUB-D socket) DP master for 125 DP devices, DP device	**6ES7545-5DA00-0AB0**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
DIN rail 35 mm	
SIMATIC, DIN rail 35 mm, Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
SIMATIC, DIN rail 35 mm Length 2 m	**6ES5710-8MA41**
SIMATIC S7-1500, grounding screw For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
SIMATIC ET 200SP, BA 2xRJ45 BusAdapter 2 RJ45 sockets	**6ES7193-6AR00-0AA0**
SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connection	**6ES7193-6AF00-0AA0**
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	**6ES7193-6AP00-0AA0**
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	**6ES7193-6AP20-0AA0**
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	**6ES7193-6AP40-0AA0**
SIMATIC BA 2xLC BusAdapter 2x LC glass fiber-optic cable connections	**6ES7193-6AG00-0AA0**
SIMATIC BusAdapter: BA LC/RJ45 Media converter glass FOC/CU 1x LC FO connection and 1x RJ45 connection	**6ES7193-6AG20-0AA0**
SIMATIC BusAdapter: BA LC/FC Media converter glass FOC/CU 1x LC FO connection and 1x FastConnect (FC) connection	**6ES7193-6AG40-0AA0**
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**
Labeling strips	
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	**6ES7193-6LR10-0AA0**

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Selection and ordering data (continued)

SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	**6ES7193-6LR10-0AG0**
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AA0**
SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AG0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 1 unit.	**6GK1901-1BB20-2AA0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 10 units.	**6GK1901-1BB20-2AB0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 50 units.	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**

Selection and ordering data (continued)

Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files under this link.	
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
Spare parts	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit	**6ES7193-4JB00-0AA0**
SIMATIC ET 200SP, spare part 5 covers For BusAdapter interface of the ET 200SP CPU	**6ES7591-3AA00-0AA0**
SIMATIC ET 200SP, spare part server module For ET 200SP	**6ES7193-6PA00-0AA0**

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Selection and ordering data (continued)

1) Up-to-date information and download availability can be found at this link.

Technical specifications

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400KB Prog., 2MB Data
General information	
Product type designation	CPU 1512SP-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7 512-1DK01-0AB0
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	400 kbyte
• integrated (for data)	2 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400KB Prog., 2MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400KB Prog., 2MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes

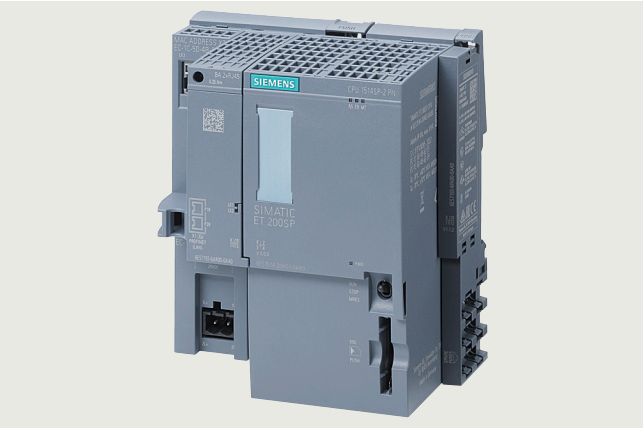
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Technical specifications (continued)

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400KB Prog., 2MB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- CPU 1514SP-2 PN for SIMATIC ET 200SP based on S7-1500 CPU 1515-2 PN
- For applications with medium/high requirements regarding program scope, networking and processing speed, for distributed configuration via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines. The additional integrated PROFINET interface with separate IP address can be used for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device, for example.
- PROFINET IO controller for up to 128 I/O devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 2-port switch
- Additional PROFINET interface with separate IP address
- Isochronous mode on PROFINET
- With multiple communication options:
  PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.
BusAdapter is not included in scope of delivery and is to be ordered separately.

Selection and ordering data

SIMATIC DP, CPU 1514SP-2 PN for ET 200SP Central processing unit with 600 KB work memory for program and 3.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required, BusAdapter required for 1st interface Observe the approvals and certificates according to entry 109818872 at support.industry.siemens.com!	**6ES7514-2DN03-0AB0**
Accessories	
SIMATIC DP, CM PROFIBUS DP For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device	**6ES7545-5DA00-0AB0**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
DIN rail 35 mm	
SIMATIC, DIN rail 35 mm Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
SIMATIC, DIN rail 35 mm Length 2 m	**6ES5710-8MA41**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
SIMATIC ET 200SP, BA 2xRJ45 BusAdapter 2 RJ45 sockets	**6ES7193-6AR00-0AA0**
SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connection	**6ES7193-6AF00-0AA0**
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	**6ES7193-6AP00-0AA0**
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	**6ES7193-6AP20-0AA0**
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	**6ES7193-6AP40-0AA0**
SIMATIC BA 2xLC BusAdapter 2x LC glass fiber-optic cable connections	**6ES7193-6AG00-0AA0**
SIMATIC BusAdapter: BA LC/RJ45 Media converter glass FOC/CU 1x LC FO connection and 1x RJ45 connection	**6ES7193-6AG20-0AA0**
SIMATIC BusAdapter: BA LC/FC Media converter glass FOC/CU 1x LC FO connection and 1x FastConnect (FC) connection	**6ES7193-6AG40-0AA0**
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**
Labeling strips	

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Selection and ordering data (continued)

SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	**6ES7193-6LR10-0AA0**
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	**6ES7193-6LR10-0AG0**
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AA0**
SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AG0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 1 unit.	**6GK1901-1BB20-2AA0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 10 units.	**6GK1901-1BB20-2AB0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 50 units.	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles) Delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**

Selection and ordering data (continued)

Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files under this link.	
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery. Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XE01-8YE2**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download1) Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
Spare parts	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit	**6ES7193-4JB00-0AA0**
SIMATIC ET 200SP, spare part 5 covers For BusAdapter interface of the ET 200SP CPU	**6ES7591-3AA00-0AA0**
SIMATIC ET 200SP, spare part server module For ET 200SP	**6ES7193-6PA00-0AA0**

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Selection and ordering data (continued)

[1] Up-to-date information and download availability can be found at this link.

Technical specifications

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
General information	
Product type designation	CPU 1514SP-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

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Technical specifications (continued)

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C

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Technical specifications (continued)

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600KB Prog.,3,5MB Data
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- SIPLUS CPU 1510SP-1 PN for SIPLUS ET 200SP based on SIPLUS S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 I/O devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options:
  PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP device (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.
The BusAdapter is not included in the scope of supply and is to be ordered separately.
No BusAdapter can be inserted with the variant for the temperature range -40...+70 °C.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1510SP-1 PN (Extended temperature range and exposure to environmental substances)	
200 KB work memory for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required Temperature range -40 ... +60 °C	**6AG1510-1DK03-2AB0**
200 KB work memory for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required Temperature range -40 ... +70 °C; No BusAdapter can be inserted	**6AG1510-1DK03-7AB0**
Accessories	
BA 2xRJ45 BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AR00-7AA0**
BA 2xFC BusAdapter for increased vibration and EMC loads (Extended temperature range and exposure to environmental substances)	**6AG1193-6AF00-7AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 (Extended temperature range and exposure to environmental substances) 180° cable outlet 1 unit	**6AG1901-1BB10-7AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP CPU 1510SP-1 PN

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Technical specifications

Article number	6AG1510-1DK03-2AB0 SIPLUS ET 200SP CPU 1510SP-1 PN	6AG1510-1DK03-7AB0 SIPLUS ET 200SP CPU 1510SP-1 PN
General information		
Product type designation	CPU 1510SP-1 PN	CPU 1510SP-1 PN
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	200 kbyte	200 kbyte
• integrated (for data)	1 Mbyte	1 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	6 ns	6 ns
for word operations, typ.	7 ns	7 ns
for fixed point arithmetic, typ.	9 ns	9 ns
for floating point arithmetic, typ.	37 ns	37 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Address space per module		
• Address space per module, max.	288 byte; For input and output data respectively	288 byte; For input and output data respectively
Address space per station		
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day		
Clock		
• Type	Hardware clock	Hardware clock

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Technical specifications (continued)

Article number	6AG1510-1DK03-2AB0 SIPLUS ET 200SP CPU 1510SP-1 PN	6AG1510-1DK03-7AB0 SIPLUS ET 200SP CPU 1510SP-1 PN
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6AG1510-1DK03-2AB0 SIPLUS ET 200SP CPU 1510SP-1 PN	6AG1510-1DK03-7AB0 SIPLUS ET 200SP CPU 1510SP-1 PN
2. Interface		
Interface types		
• RS 485	Yes; Via CM DP module	Yes; Via CM DP module
• Number of ports	1	1
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols		
Number of connections		
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode		
- Media redundancy		
- Media redundancy	Yes; only via BusAdapter	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes	Yes
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120	1 120
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes

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Technical specifications (continued)

Article number	6AG1510-1DK03-2AB0 SIPLUS ET 200SP CPU 1510SP-1 PN	6AG1510-1DK03-7AB0 SIPLUS ET 200SP CPU 1510SP-1 PN
Security		
PROFINET Security Class	1	1
signed firmware update	Yes	Yes
Secure Boot	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0-AA0)	
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0-AA0)	
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1510-1DK03-2AB0 SIPLUS ET 200SP CPU 1510SP-1 PN	6AG1510-1DK03-7AB0 SIPLUS ET 200SP CPU 1510SP-1 PN
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	No	No
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users	100	100
Dimensions		
Width	100 mm	100 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	265 g	415 g

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Overview



- SIPLUS CPU 1512SP-1 PN for SIPLUS ET 200SP based on SIPLUS S7-1500 CPU 1513-1 PN
- For applications with average requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options:
  PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP device (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.
BusAdapter is not included in scope of supply and is to be ordered separately.
No BusAdapter can be inserted with the variant for the temperature range -40...+70 °C.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1512SP-1 PN (Extended temperature range and exposure to environmental substances)	
400 KB work memory for program, 2 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required Temperature range -40 ... +60 °C;	**6AG1512-1DM03-2AB0**
400 KB work memory for program, 2 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required Temperature range -40 ... +70 °C; No BusAdapter can be inserted	**6AG1512-1DM03-7AB0**
Accessories	
BA 2xRJ45 BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AR00-7AA0**
BA 2xFC BusAdapter for increased vibration and EMC loads (Extended temperature range and exposure to environmental substances)	**6AG1193-6AF00-7AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 180° cable outlet 1 unit	**6AG1901-1BB10-7AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, CPU 1512SP-1 PN

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Technical specifications

Article number	6AG1512-1DM03-2AB0 SIPLUS ET 200SP CPU 1512SP-1 PN	6AG1512-1DM03-7AB0 SIPLUS ET 200SP CPU 1512SP-1 PN
General information		
Product type designation	CPU 1512SP-1 PN	CPU 1512SP-1 PN
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	400 kbyte	400 kbyte
• integrated (for data)	2 Mbyte	2 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	6 ns	6 ns
for word operations, typ.	7 ns	7 ns
for fixed point arithmetic, typ.	9 ns	9 ns
for floating point arithmetic, typ.	37 ns	37 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Address space per module		
• Address space per module, max.	288 byte; For input and output data respectively	288 byte; For input and output data respectively
Address space per station		
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day		
Clock		
• Type	Hardware clock	Hardware clock

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Technical specifications (continued)

Article number	6AG1512-1DM03-2AB0 SIPLUS ET 200SP CPU 1512SP-1 PN	6AG1512-1DM03-7AB0 SIPLUS ET 200SP CPU 1512SP-1 PN
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- PG/OP communication		Yes
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6AG1512-1DM03-2AB0 SIPLUS ET 200SP CPU 1512SP-1 PN	6AG1512-1DM03-7AB0 SIPLUS ET 200SP CPU 1512SP-1 PN
2. Interface		
Interface types		
• RS 485	Yes; Via CM DP module	Yes; Via CM DP module
• Number of ports	1	1
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols		
Number of connections		
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode		
- Media redundancy		
- Media redundancy	Yes; only via BusAdapter	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes	Yes
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120	1 120
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes

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Technical specifications (continued)

Article number	6AG1512-1DM03-2AB0 SIPLUS ET 200SP CPU 1512SP-1 PN	6AG1512-1DM03-7AB0 SIPLUS ET 200SP CPU 1512SP-1 PN
Security		
PROFINET Security Class	1	1
signed firmware update		Yes
Secure Boot		Yes
safely removing data		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0-AA0)	
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0-AA0)	
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1512-1DM03-2AB0 SIPLUS ET 200SP CPU 1512SP-1 PN	6AG1512-1DM03-7AB0 SIPLUS ET 200SP CPU 1512SP-1 PN
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	No	No
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users	100	100
Dimensions		
Width	100 mm	100 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	265 g	415 g

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Overview



- CPU 1510SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 64 I/O devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Selection and ordering data

SIMATIC DP, CPU 1510SP F-1 PN for ET 200SP Central processing unit with 300 KB work memory for program and 1 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2 Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!	**6ES7510-1SK03-0AB0**
Accessories	
SIMATIC DP, CM PROFIBUS DP For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device	**6ES7545-5DA00-0AB0**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
DIN rail 35 mm	
SIMATIC, DIN rail 35 mm Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
SIMATIC, DIN rail 35 mm Length 2 m	**6ES5710-8MA41**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
SIMATIC ET 200SP, BA 2xRJ45 BusAdapter 2 RJ45 sockets	**6ES7193-6AR00-0AA0**
SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connection	**6ES7193-6AF00-0AA0**
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	**6ES7193-6AP00-0AA0**
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	**6ES7193-6AP20-0AA0**
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	**6ES7193-6AP40-0AA0**
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**
Labeling strips	
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	**6ES7193-6LR10-0AA0**
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	**6ES7193-6LR10-0AG0**
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AA0**

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Selection and ordering data (continued)

SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AG0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 1 unit.	**6GK1901-1BB20-2AA0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 10 units.	**6GK1901-1BB20-2AB0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 50 units.	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under this link.	

Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1)] Engineering software in the TIA Portal; software, documentation and license key for downloading[1)]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	

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Selection and ordering data (continued)

SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
Spare parts	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit	**6ES7193-4JB00-0AA0**
SIMATIC ET 200SP, spare part 5 covers For BusAdapter interface of the ET 200SP CPU	**6ES7591-3AA00-0AA0**
SIMATIC ET 200SP, spare part server module For ET 200SP	**6ES7193-6PA00-0AA0**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
General information	
Product type designation	CPU 1510SP F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7510-1SJ01-0AB0
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes

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Technical specifications (continued)

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- CPU 1512SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 128 I/O devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options:
  PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Selection and ordering data

SIMATIC DP, CPU 1512SP F-1 PN for ET 200SP Central processing unit with 600 KB work memory for program and 2 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2 Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!	**6ES7512-1SM03-0AB0**
Accessories	
SIMATIC DP, CM PROFIBUS DP for ET 200SP CPU Module with PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device	**6ES7545-5DA00-0AB0**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
DIN rail 35 mm	
SIMATIC, DIN rail 35 mm Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
SIMATIC, DIN rail 35 mm Length 2 m	**6ES5710-8MA41**
SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
SIMATIC ET 200SP, BA 2xRJ45 BusAdapter 2 RJ45 sockets	**6ES7193-6AR00-0AA0**
SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connection	**6ES7193-6AF00-0AA0**
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	**6ES7193-6AP00-0AA0**
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	**6ES7193-6AP20-0AA0**
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	**6ES7193-6AP40-0AA0**
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**
Labeling strips	
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	**6ES7193-6LR10-0AA0**
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	**6ES7193-6LR10-0AG0**
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AA0**

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Selection and ordering data (continued)

SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AG0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 1 unit.	**6GK1901-1BB20-2AA0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 10 units.	**6GK1901-1BB20-2AB0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 50 units.	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under this link.	

Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery. Current Manual Collection DVD and the three subsequent updates	**6ES7998-8XE01-8YE2**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	

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Selection and ordering data (continued)

SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
Spare parts	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit	**6ES7193-4JB00-0AA0**
SIMATIC ET 200SP, spare part 5 covers For BusAdapter interface of the ET 200SP CPU	**6ES7591-3AA00-0AA0**
SIMATIC ET 200SP, spare part server module For ET 200SP	**6ES7193-6PA00-0AA0**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600KB Prog.2MB Data
General information	
Product type designation	CPU 1512SP F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7 512-1SK01-0AB0
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	2 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600KB Prog.2MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600KB Prog.2MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes

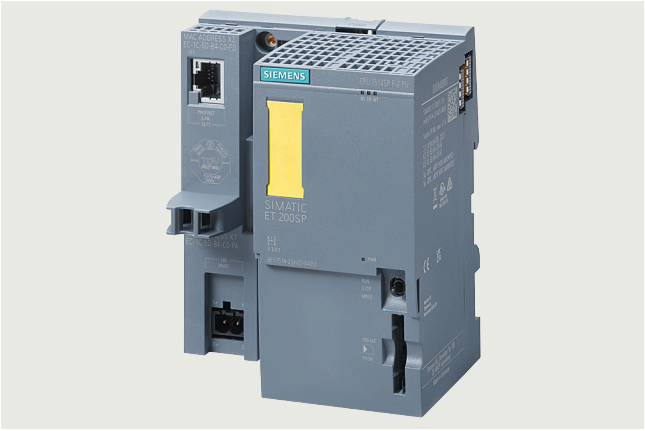
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Technical specifications (continued)

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600KB Prog.2MB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- CPU 1514SP F21 PN for SIMATIC ET 200SP based on S7-1500 CPU 1515F-2 PN
- For applications with medium/high requirements regarding program scope, networking and processing speed, for distributed configuration via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines. The additional integrated PROFINET interface with separate IP address can be used for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device, for example.
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 128 I/O devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 2-port switch
- Additional PROFINET interface with separate IP address
- Isochronous mode on PROFINET
- With multiple communication options:
  PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Selection and ordering data

SIMATIC DP, CPU 1514SP F-2 PN for ET 200SP Central processing unit with 900 KB work memory for program and 3.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required, BusAdapter required for 1st interface Observe the approvals and certificates according to entry 109818872 at support.industry.siemens.com!	**6ES7514-2SN03-0AB0**
Accessories	
SIMATIC DP, CM PROFIBUS DP For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device	**6ES7545-5DA00-0AB0**
SIMATIC Memory Card	
SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS 3.3 V Flash, 4 MB	**6ES7954-8LC04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 12 MB	**6ES7954-8LE04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS 3.3 V Flash, 24 MB	**6ES7954-8LF04-0AA0**
SIMATIC S7, memory card for S7-1x00 CPU 3.3 V Flash, 256 MB	**6ES7954-8LL04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 2 GB	**6ES7954-8LP04-0AA0**
SIMATIC S7, memory card for S7-1x 00 CPU 3.3 V Flash, 32 GB	**6ES7954-8LT04-0AA0**
DIN rail 35 mm	
SIMATIC, DIN rail 35 mm Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
SIMATIC, DIN rail 35 mm Length 2 m	**6ES5710-8MA41**
SIMATIC S7-1500, grounding screw For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
SIMATIC ET 200SP, BA 2XRJ45 BusAdapter 2x RJ45 sockets	**6ES7193-6AR00-0AA0**
SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connections	**6ES7193-6AF00-0AA0**
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	**6ES7193-6AP00-0AA0**
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	**6ES7193-6AP20-0AA0**
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	**6ES7193-6AP40-0AA0**
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**
Labeling strips	
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	**6ES7193-6LR10-0AA0**
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	**6ES7193-6LR10-0AG0**
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AA0**

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Selection and ordering data (continued)

SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AG0**
IE FC RJ45 plugs	
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 1 unit.	**6GK1901-1BB20-2AA0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 10 units.	**6GK1901-1BB20-2AB0**
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 50 units.	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180	
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m, minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under this link.	

Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	

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Selection and ordering data (continued)

SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user; license key on USB flash drive Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user; license key for download[1)] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
Spare parts	
Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit	**6ES7193-4JB00-0AA0**
SIMATIC ET 200SP, spare part 5 covers For BusAdapter interface of the ET 200SP CPU	**6ES7591-3AA00-0AA0**
SIMATIC ET 200SP, spare part server module For ET 200SP	**6ES7193-6PA00-0AA0**

[1)] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KB Prog.3,5MB Data
General information	
Product type designation	CPU 1514SP F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KB Prog.3,5MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KB Prog.3,5MB Data
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

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Technical specifications (continued)

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KB Prog.3,5MB Data
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C

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Technical specifications (continued)

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900KB Prog.3,5MB Data
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- SIPLUS CPU 1510SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1510SP F-1 PN (Extended temperature range and exposure to environmental substances) Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required Temperature range -40 ... +60 °C	**6AG1510-1SK03-2AB0**
Accessories	
SIPLUS BA 2xRJ45 BusAdapter	**6AG1193-6AR00-7AA0**
SIPLUS BA 2xFC BusAdapter	**6AG1193-6AF00-7AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 (Extended temperature range and exposure to environmental substances) 180° cable outlet 1 unit	**6AG1901-1BB10-7AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, CPU 1510 F-1 PN

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Technical specifications

Article number	6AG1510-1SK03-2AB0 SIPLUS ET 200SP CPU 1510SP F-1 PN
General information	
Product type designation	CPU 1510SP F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6AG1510-1SK03-2AB0 SIPLUS ET 200SP CPU 1510SP F-1 PN
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

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Technical specifications (continued)

Article number	6AG1510-1SK03-2AB0 SIPLUS ET 200SP CPU 1510SP F-1 PN
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes

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Technical specifications (continued)

Article number	6AG1510-1SK03-2AB0 SIPLUS ET 200SP CPU 1510SP F-1 PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100

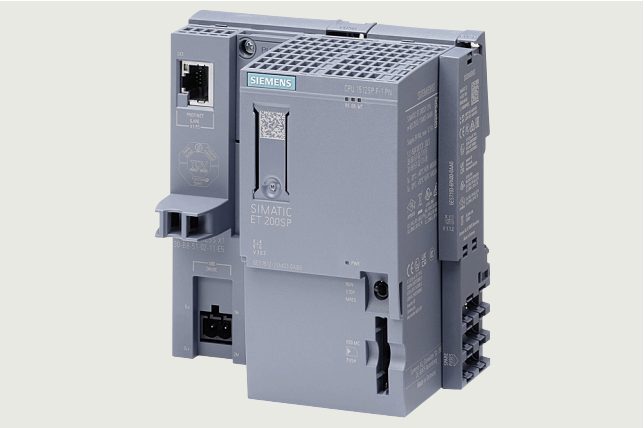
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Technical specifications (continued)

Article number	6AG1510-1SK03-2AB0 SIPLUS ET 200SP CPU 1510SP F-1 PN
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- SIPLUS CPU 1512SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with average requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options:
  PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CPU 1512SP F-1 PN (Extended temperature range and exposure to environmental substances) Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required Temperature range -40...+70 °C; No BusAdapter can be inserted	**6AG1512-1SK01-7AB0**
600 KB work memory for program, 2 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required Temperature range -40...+0 °C;	**6AG1512-1SM03-2AB0**
600 KB work memory for program, 2 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required Temperature range -40...+70 °C; No BusAdapter can be inserted	**6AG1512-1SM03-7AB0**
Accessories	
SIPLUS BA 2xRJ45 BusAdapter	**6AG1193-6AR00-7AA0**
SIPLUS BA 2xFC BusAdapter	**6AG1193-6AF00-7AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 (Extended temperature range and exposure to environmental substances) 180° cable outlet 1 unit	**6AG1901-1BB10-7AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, CPU 1512 F-1 PN

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Technical specifications

Article number	6AG1512-1SK01-7AB0 SIPLUS ET 200SP CPU 1512SP F-1 PN	6AG1512-1SM03-2AB0 SIPLUS ET 200SP CPU 1512SP F-1 PN	6AG1512-1SM03-7AB0 SIPLUS ET 200SP CPU 1512SP F-1 PN
General information			
Product type designation	CPU 1512SP F-1 PN	CPU 1512SP F-1 PN	CPU 1512SP F-1 PN
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Storage			
Work memory			
• integrated (for program)	300 kbyte	600 kbyte	600 kbyte
• integrated (for data)	1 Mbyte	2 Mbyte	2 Mbyte
Load memory			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times			
for bit operations, typ.	48 ns	6 ns	25 ns
for word operations, typ.	58 ns	7 ns	32 ns
for fixed point arithmetic, typ.	77 ns	9 ns	42 ns
for floating point arithmetic, typ.	307 ns	37 ns	170 ns
Counters, timers and their retentivity			
S7 counter			
• Number	2 048	2 048	2 048
IEC counter			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer			
• Number	2 048	2 048	2 048
IEC timer			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity			
Flag			
• Size, max.	16 kbyte	16 kbyte	16 kbyte
Address area			
I/O address area			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Address space per module			
• Address space per module, max.	288 byte; For input and output data respectively	288 byte; For input and output data respectively	288 byte; For input and output data respectively
Address space per station			
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day			
Clock			
• Type	Hardware clock	Hardware clock	Hardware clock

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Technical specifications (continued)

Article number	6AG1512-1SK01-7AB0	6AG1512-1SM03-2AB0	6AG1512-1SM03-7AB0
	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN
1. Interface			
Interface types			
• RJ 45 (Ethernet)	Yes; X1 P3	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	1	3; 1. integr. + 2. via BusAdapter	3; 1. integr. + 2. via BusAdapter
• integrated switch		Yes	Yes
• BusAdapter (PROFINET)	No	Yes	Yes
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	Yes	Yes
PROFINET IO Controller			
- Services			
- PG/OP communication	Yes		
- Isochronous mode	Yes	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes	Yes
- Dynamic Frame Packing (DFP)		Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max.	128	128	128
- of which in line, max.	128	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1	1
PROFINET IO Device			
- Services			
- PG/OP communication	Yes		
- Isochronous mode	No	No	No
- IRT	Yes	Yes	Yes
- Dynamic Frame Packing (DFP)		No	No
- PROFIenergy	Yes; per user program	Yes; per user program	Yes; per user program
- Prioritized startup		Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6AG1512-1SK01-7AB0	6AG1512-1SM03-2AB0	6AG1512-1SM03-7AB0
	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN
2. Interface			
Interface types			
• RS 485	Yes; Via CM DP module	Yes; Via CM DP module	Yes; Via CM DP module
• Number of ports	1	1	1
Protocols			
• PROFIBUS DP master	Yes	Yes	Yes
• PROFIBUS DP device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
PROFIBUS DP master			
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols			
Number of connections			
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode			
- Media redundancy			
- Media redundancy	No	Yes; only via BusAdapter	Yes; only via BusAdapter
- MRP	No	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	No	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	No	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.		200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.		50	50
SIMATIC communication			
• S7 routing	Yes	Yes	Yes
OPC UA			
• OPC UA Client	Yes	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions		Yes	Yes

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Technical specifications (continued)

Article number	6AG1512-1SK01-7AB0	6AG1512-1SM03-2AB0	6AG1512-1SM03-7AB0
	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN
Supported technology objects			
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	1 120	1 120
• Required Motion Control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
Controller			
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring			
• High-speed counter	Yes	Yes	Yes
Security			
PROFINET Security Class		1	1
signed firmware update		Yes	Yes
Secure Boot		Yes	Yes
safely removing data		Yes	Yes

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Technical specifications (continued)

Article number	6AG1512-1SK01-7AB0	6AG1512-1SM03-2AB0	6AG1512-1SM03-7AB0
	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	No	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3		Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG119-3-6AB00-0AA0)	
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust (with the exception of oil droplets in the air); *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6		Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193--6AB00-0AA0)	
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

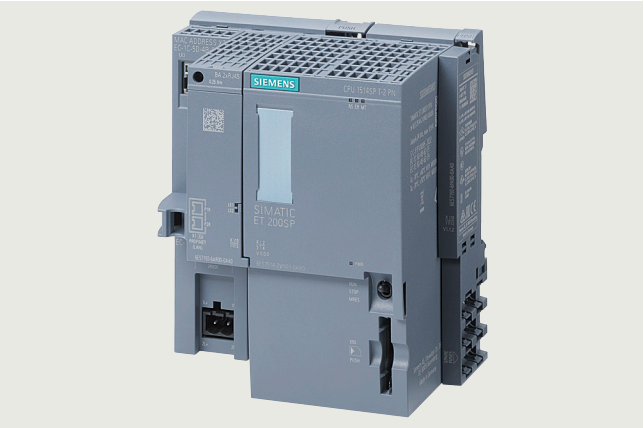
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Technical specifications (continued)

Article number	6AG1512-1SK01-7AB0	6AG1512-1SM03-2AB0	6AG1512-1SM03-7AB0
	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN
Configuration			
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• protection of confidential configuration data		Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Write protection for Failsafe		Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
• User administration		Yes; device-wide and centralized	Yes; device-wide and centralized
• Number of users		100	100
Dimensions			
Width	100 mm	100 mm	100 mm
Height	117 mm	117 mm	117 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	470 g	265 g	415 g

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Overview



- The CPU for applications with medium to high requirements regarding program/data storage in the SIMATIC ET 200SP T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- PROFINET IO IRT interface with 2-port switch, corresponding BusAdapter required
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note
SIMATIC Memory Card required for operation of the CPU.

Overview (continued)

The BusAdapter is not included in the scope of supply and must be ordered separately.

Selection and ordering data

CPU 1514SP T-2 PN 900 KB work memory for program, 3.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required	**6ES7514-2VN03-0AB0**
Accessories	
CM DP for ET 200SP CPU PROFIBUS DP master/device with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
SIMATIC Memory Card	
4 MB	**6ES7954-8LC04-0AA0**
12 MB	**6ES7954-8LE04-0AA0**
24 MB	**6ES7954-8LF04-0AA0**
256 MB	**6ES7954-8LL04-0AA0**
2 GB	**6ES7954-8LP04-0AA0**
32 GB	**6ES7954-8LT04-0AA0**
DIN rail 35 mm	
• Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
• Length: 483 mm for 600 mm cabinets	**6ES5710-8MA21**
• Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
• Length 2 m	**6ES5710-8MA41**
PE connection element for 2000 mm mounting rail 20 units	**6ES7590-5AA00-0AA0**
BA 2xRJ45 BusAdapter	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter for increased vibration and EMC loads	**6ES7193-6AF00-0AA0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
IE FC RJ45 plugs RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 90 90° cable outlet	
1 unit	**6GK1901-1BB20-2AA0**
10 units	**6GK1901-1BB20-2AB0**
50 units	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**

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Selection and ordering data (continued)

IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use in cable carriers; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP marine cable 2 x 2 (type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**

Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**
Spare parts	
Power supply connector Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals; 10 units	**6ES7193-4JB00-0AA0**
Cover for BusAdapter interface 5 units	**6ES7591-3AA00-0AA0**
Server module	**6ES7193-6PA00-0AA0**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
General information	
Product type designation	CPU 1514SP T-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC, BA 2x LC-LD, BA LC-LD / RJ45, BA LC-LD / M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

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Technical specifications (continued)

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

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Technical specifications (continued)

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

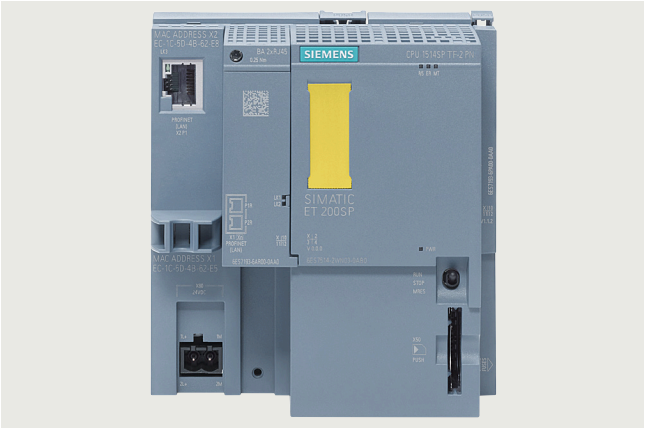
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Technical specifications (continued)

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- The CPU for standard and fail-safe applications with medium to high requirements regarding program/data storage in the SIMATIC ET 200SP T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- PROFINET IO IRT interface with 2-port switch, corresponding BusAdapter required
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-device
- OPC UA Server and Client as Runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications
  - OPC UA Alarms & Conditions
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Overview (continued)

The BusAdapter is not included in the scope of supply and must be ordered separately.

Selection and ordering data

CPU 1514SP TF-2 PN 900 KB work memory for program, 3.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required	**6ES7514-2WN03-0AB0**
Accessories	
CM DP for ET 200SP CPU PROFIBUS DP master/device with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
SIMATIC Memory Card	
4 MB	**6ES7954-8LC04-0AA0**
12 MB	**6ES7954-8LE04-0AA0**
24 MB	**6ES7954-8LF04-0AA0**
256 MB	**6ES7954-8LL04-0AA0**
2 GB	**6ES7954-8LP04-0AA0**
32 GB	**6ES7954-8LT04-0AA0**
DIN rail 35 mm	
• Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
• Length: 483 mm for 600 mm cabinets	**6ES5710-8MA21**
• Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
• Length 2 m	**6ES5710-8MA41**
PE connection element for 2000 mm mounting rail 20 units	**6ES7590-5AA00-0AA0**
BA 2xRJ45 BusAdapter	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter for increased vibration and EMC loads	**6ES7193-6AF00-0AA0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
IE FC RJ45 plugs RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 90 90° cable outlet	
1 unit	**6GK1901-1BB20-2AA0**
10 units	**6GK1901-1BB20-2AB0**
50 units	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**

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Selection and ordering data (continued)

IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use in cable carriers; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP marine cable 2 x 2 (type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**

Selection and ordering data (continued)

STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA25-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA25-0YH5**
SIMATIC Manual Collection DL in 5 languages[1] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**
Spare parts	
Power supply connector Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals; 10 units	**6ES7193-4JB00-0AA0**
Cover for BusAdapter interface 5 units	**6ES7591-3AA00-0AA0**
Server module	**6ES7193-6PA00-0AA0**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
General information	
Product type designation	CPU 1514SP TF-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V4.1) / V18 (FW V3.0) or higher
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC, BA 2x LC-LD, BA LC-LD / RJ45, BA LC-LD / M12
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program

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Technical specifications (continued)

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

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Technical specifications (continued)

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

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Technical specifications (continued)

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900KB Prg, 3,5MB Dat
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; No condensation
• vertical installation, max.	50 °C
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

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Overview



- Turnkey all-in-one solution with preinstalled SIMATIC S7-1500 Software Controller Standard and optional preinstalled WinCC Runtime Advanced
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor:
  For separating the Windows or Linux operating system from control functions
- Quad-core processor for optimal use of the Hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DisplayPort; 2x USB 3.0; 2 x USB 2.0 port
- 2 PROFINET interfaces: X1 via PN-IO BusAdapter (RJ45 or FC) with 2 ports; X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, ISO-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP Module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes with support for external encoders
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

Selection and ordering data

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 **Type of delivery:** en, de, fr, es, it, zh Industrial OS and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card	
• CPU 1515SP PC2 (8 GB RAM) Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card	**6ES7677-2DB43-0GB1**
• CPU 1515SP PC2 (48 GB RAM) Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card	**6ES7677-2DB42-0GB1**
• CPU 1515SP PC2 + HMI 128PT	**6ES7677-2DB42-0GK0**
• CPU 1515SP PC2 + HMI 512PT	**6ES7677-2DB42-0GL0**
• CPU 1515SP PC2 + HMI 2048PT	**6ES7677-2DB42-0GM0**
Accessories	
BA 2xRJ45 BusAdapter	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter	**6ES7193-6AF00-0AA0**
BA 2xSCRJ BusAdapter	**6ES7193-6AP00-0AA0**
BA SCRJ/RJ45 BusAdapter	**6ES7193-6AP20-0AA0**
BA SCRJ/FC BusAdapter For increased vibration and EMC loads	**6ES7193-6AP40-0AA0**
BA 2XLC BusAdapter	**6ES7193-6AG00-0AA0**
BA LC/RJ45 BusAdapter	**6ES7193-6AG20-0AA0**
BA LC/FC BusAdapter	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Server module Spare part	**6ES7193-6PA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 operating system upgrade package Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade image	**6ES7678-2AD01-0AA0**

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Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC ODK 1500S	
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) [1] Email address required for delivery	**6ES7806-2CD03-0YG0**
WinCC Advanced V19 Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA02-3AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA02-3AH5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
General information		
Product type designation	CPU 1515SP PC2	CPU1515SP PC2 - IndOS
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V19	V19
Installed software		
• Visualization	No	No
• Control	S7-1500 Software Controller CPU 1505SP	S7-1500 Software Controller CPU 1505SP
Supply voltage		
Rated value (DC)	24 V	24 V
Processor		
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores	Intel Atom E3940, 1.6 GHz, 4 cores
Storage		
Type of memory	DDR3L	DDR3L
Main memory	8 GB RAM	8 GB RAM
CFast memory card	Yes; 128 GB flash memory	Yes; 128 GB flash memory
Work memory		
• integrated (for program)	2 Mbyte	2 Mbyte
• integrated (for data)	7.5 Mbyte	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte	20 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s	Yes; Resolution: 1 s

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Technical specifications (continued)

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
1. Interface		
Interface type	PROFINET	PROFINET
Number of connections	88	88
Interface types		
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- of which in line, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
- Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
2. Interface		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
Interface types		
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No
• Number of ports	1	1
3. Interface		
Interface type	PROFIBUS with CM DP	PROFIBUS with CM DP
Number of connections	44	44
Interface types		
• RS 485	Yes	Yes
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125	125
Protocols		
Number of connections		
• Number of connections, max.	88	88
Redundancy mode		
- Media redundancy		
- Media redundancy	Yes; only via BusAdapter	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes

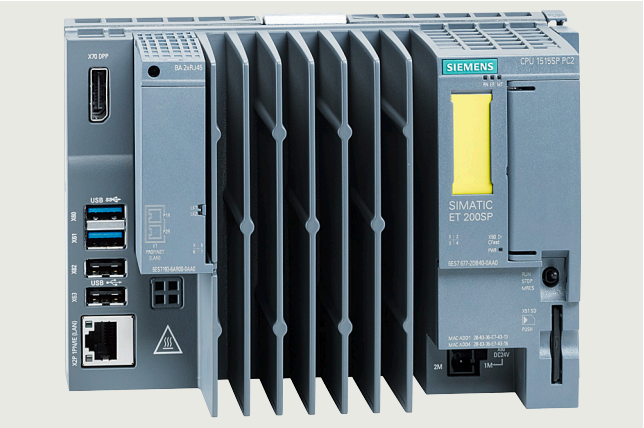
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Technical specifications (continued)

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-20 °C	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems		
pre-installed operating system	Windows 10 IoT Enterprise 2021 LTSC	SIMATIC Industrial OS
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
• Number of users	100	100
Open Development interfaces		
• Size of ODK SO file, max.	5.8 Mbyte	5.8 Mbyte
Peripherals/Options		
SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	0.83 kg	0.83 kg

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Overview



- Turnkey all-in-one solution with preinstalled fail-safe SIMATIC S7-1500 Software Controller and optional preinstalled WinCC Runtime Advanced
- Fail-safe versions make it possible to control machines or plants in a fail-safe environment. This makes it possible to address applications which require an SIL3 (Safety Integrity Level) safety class according to IEC 61508 2nd Edition or a PL e (Performance Level) according to ISO 13849.
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor:
  For separating the Windows or Linux operating system from control functions
- Quad-core processor for optimal use of the Hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DisplayPort; 2x USB 3.0; 2x USB 2.0 port
- 2 PROFINET interfaces: X1 via PN-IO BusAdapter (RJ45 or FC) with 2 ports; X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, ISO-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP Module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes with support for external encoders
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

Selection and ordering data

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 F (+ HMI) **Type of delivery:** en, de, fr, es, it, zh	
Industrial OS and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card	
• **CPU 1515SP PC2 F (8 GB RAM)**	**6ES7677-2SB43-0GB1**
Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card	
• **CPU 1515SP PC2 F (8 GB RAM)**	**6ES7677-2SB42-0GB1**
Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card	
• **CPU 1515SP PC2 F + HMI 128PT (8 GB RAM)**	**6ES7677-2SB42-0GK0**
• **CPU 1515SP PC2 F + HMI 512PT (8 GB RAM)**	**6ES7677-2SB42-0GL0**
• **CPU 1515SP PC2 F + HMI 2048PT (8 GB RAM)**	**6ES7677-2SB42-0GM0**
Accessories	
BA 2xRJ45 BusAdapter	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter	**6ES7193-6AF00-0AA0**
BA 2xSCRJ BusAdapter	**6ES7193-6AP00-0AA0**
BA SCRJ/RJ45 BusAdapter	**6ES7193-6AP20-0AA0**
BA SCRJ/FC BusAdapter For increased vibration and EMC loads	**6ES7193-6AP40-0AA0**
BA 2XLC BusAdapter	**6ES7193-6AG00-0AA0**
BA LC/RJ45 BusAdapter	**6ES7193-6AG20-0AA0**
BA LC/FC BusAdapter	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Server module Spare part	**6ES7193-6PA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 F **Operating system upgrade package** Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and SB flash drive with upgrade image	**6ES7678-2AS01-0AA0**

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Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC ODK 1500S	
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) [1] Email address required for delivery	**6ES7806-2CD03-0YG0**
WinCC Advanced V19 Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA02-3AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA02-3AH5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
General information		
Product type designation	CPU 1515SP PC2 F	CPU1515SP PC2 F - IndOS
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V31.1) / V18 (FW V30.0) or higher	V20 (FW V31.1) / V18 (FW V30.0) or higher
Installed software		
• Visualization	No	No
• Control	S7-1500 Software Controller CPU 1505SP F	S7-1500 Software Controller CPU 1505SP F
Supply voltage		
Rated value (DC)	24 V	24 V
Processor		
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores	Intel Atom E3940, 1.6 GHz, 4 cores
Storage		
Type of memory	DDR3L	DDR3L
Main memory	8 GB RAM	8 GB RAM
CFast memory card	Yes; 128 GB flash memory	Yes; 128 GB flash memory
Work memory		
• integrated (for program)	3 Mbyte	3 Mbyte
• integrated (for data)	7.5 Mbyte	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte	20 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s	Yes; Resolution: 1 s

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Technical specifications (continued)

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
1. Interface		
Interface type	PROFINET	PROFINET
Number of connections	88	88
Interface types		
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- of which in line, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
- Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte

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Technical specifications (continued)

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
2. Interface		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
Interface types		
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No
• Number of ports	1	1
3. Interface		
Interface type	PROFIBUS with CM DP	PROFIBUS with CM DP
Number of connections	44	44
Interface types		
• RS 485	Yes	Yes
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125	125
Protocols		
Number of connections		
• Number of connections, max.	88	88
Redundancy mode		
- Media redundancy		
- Media redundancy	Yes; only via BusAdapter	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes

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Technical specifications (continued)

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-20 °C	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems		
pre-installed operating system	Windows 10 IoT Enterprise 2021 LTSC	SIMATIC Industrial OS
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
• Number of users	100	100
Open Development interfaces		
• Size of ODK SO file, max.	5.8 Mbyte	5.8 Mbyte
Peripherals/Options		
SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm

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Technical specifications (continued)

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
Weights		
Weight, approx.	0.83 kg	0.83 kg

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Overview



ET 200SP Open Controller CPU, 1515SP PC2 T combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one solution with preinstalled SIMATIC S7-1500 Software Controller T and optional preinstalled WinCC Runtime Advanced
- High performance automation tasks with the use of Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S
- PROFINET IO IRT interface with 2-port switch (corresponding BusAdapter required)
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Increased number of Motion Control resources (5,120 credits) from version 30.1 of the Software Controller and TIA Portal V19 Update 1

Selection and ordering data

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 T ET 200SP central module with Windows 10 IoT Enterprise 64-bit and preinstalled SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 128 GB CFast card; with extended Motion Control functionality **Type of delivery:** en, de, fr, es, it, zh	
• **CPU 1515SP PC2 T** With preinstalled WinCC RT Advanced	**6ES7677-2VB42-0GB1**
• **CPU 1515SP PC2 T + HMI 128PT**	**6ES7677-2VB42-0GK0**
• **CPU 1515SP PC2 T + HMI 512PT**	**6ES7677-2VB42-0GL0**
• **CPU 1515SP PC2 T + HMI 2048PT**	**6ES7677-2VB42-0GM0**
Accessories	
BA 2xRJ45 BusAdapter	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter	**6ES7193-6AF00-0AA0**
BA 2xSCRJ BusAdapter	**6ES7193-6AP00-0AA0**
BA SCRJ/RJ45 BusAdapter	**6ES7193-6AP20-0AA0**
BA SCRJ/FC BusAdapter For increased vibration and EMC loads	**6ES7193-6AP40-0AA0**
BA 2XLC BusAdapter	**6ES7193-6AG00-0AA0**
BA LC/RJ45 BusAdapter	**6ES7193-6AG20-0AA0**
BA LC/FC BusAdapter	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Server module Spare part	**6ES7193-6PA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 T **Operating system upgrade package** Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade Image, license stick: CPU 1505SP T V3	**6ES7678-2AV01-0AA0**

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Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC ODK 1500S	
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) [1] Email address required for delivery	**6ES7806-2CD03-0YG0**
WinCC Advanced V19	
Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA02-3AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AH5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
General information	
Product type designation	CPU 1515SP PC2 T
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V31.1) / V18 (FW V30.0) or higher
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP T
Supply voltage	
Rated value (DC)	24 V
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Storage	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 128 GB flash memory
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s

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Technical specifications (continued)

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
1. Interface	
Interface type	PROFINET
Number of connections	88
Interface types	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
2. Interface	
Interface type	Integrated Ethernet interface
Interface types	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
3. Interface	
Interface type	PROFIBUS with CM DP
Number of connections	44
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125
Protocols	
Number of connections	
• Number of connections, max.	88
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes

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Technical specifications (continued)

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	5 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- Per leading axis proxy	3
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2021 LTSC
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm

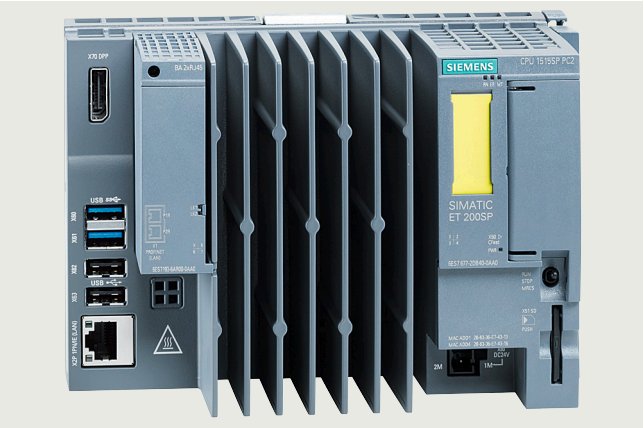
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Technical specifications (continued)

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
Weights	
Weight, approx.	0.83 kg

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Overview



ET 200SP Open Controller, CPU 1515SP PC2 TF, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one solution with preinstalled fail-safe SIMATIC S7-1500 Software Controller TF and optional preinstalled WinCC Runtime Advanced
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S
- PROFINET IO IRT interface with 2-port switch (corresponding BusAdapter required)
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed axes and positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Increased number of Motion Control resources (5,120 credits) from version 30.1 of the Software Controller and TIA Portal V19 Update 1

Selection and ordering data

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 TF Fail-safe ET 200SP central module with Windows 10 IoT Enterprise 64-bit and preinstalled fail-safe SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 128 GB CFast card; with extended Motion Control functionality **Type of delivery:** en, de, fr, es, it, zh	
• **CPU 1515SP PC2 TF** With preinstalled WinCC RT Advanced	**6ES7677-2WB42-0GB1**
• **CPU 1515SP PC2 TF + HMI 128PT**	**6ES7677-2WB42-0GK0**
• **CPU 1515SP PC2 TF + HMI 512PT**	**6ES7677-2WB42-0GL0**
• **CPU 1515SP PC2 TF + HMI 2048PT**	**6ES7677-2WB42-0GM0**
Accessories	
BA 2xRJ45 BusAdapter	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter	**6ES7193-6AF00-0AA0**
BA 2xSCRJ BusAdapter	**6ES7193-6AP00-0AA0**
BA SCRJ/RJ45 BusAdapter	**6ES7193-6AP20-0AA0**
BA SCRJ/FC BusAdapter For increased vibration and EMC loads	**6ES7193-6AP40-0AA0**
BA 2XLC BusAdapter	**6ES7193-6AG00-0AA0**
BA LC/RJ45 BusAdapter	**6ES7193-6AG20-0AA0**
BA LC/FC BusAdapter	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Server module Spare part	**6ES7193-6PA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 TF **Operating system upgrade package,** Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade Image, license stick: CPU 1505SP TF V3	**6ES7678-2AW01-0AA0**

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Selection and ordering data (continued)

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
SIMATIC STEP 7 Professional V21; floating license Engineering software in the TIA Portal; software, documentation and license key on USB flash drive; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link	**6ES7822-1AA25-0YA5**
SIMATIC STEP 7 Professional V21, floating license download[1] Engineering software in the TIA Portal; software, documentation and license key for downloading[1]; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at this link Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
SIMATIC ODK 1500S	
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) [1] Email address required for delivery	**6ES7806-2CD03-0YG0**
WinCC Advanced V19 Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA02-3AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA02-3AH5**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
General information	
Product type designation	CPU 1515SP PC2 TF
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V31.1) / V18 (FW V30.0) or higher
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP TF
Supply voltage	
Rated value (DC)	24 V
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Storage	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 128 GB flash memory
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s

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Technical specifications (continued)

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
1. Interface	
Interface type	PROFINET
Number of connections	88
Interface types	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
2. Interface	
Interface type	Integrated Ethernet interface
Interface types	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
3. Interface	
Interface type	PROFIBUS with CM DP
Number of connections	44
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125
Protocols	
Number of connections	
• Number of connections, max.	88
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes

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Technical specifications (continued)

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	5 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- Per leading axis proxy	3
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems	
pre-installed operating system	Windows 10 Enterprise 2021 LTSC
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm

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Technical specifications (continued)

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
Weights	
Weight, approx.	0.83 kg

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Overview



SIPLUS ET 200SP Open Controller, SIPLUS CPU 1515SP PC2, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the SIPLUS ET 200SP system, the SIPLUS S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a SIPLUS ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS ET 200SP Open Controller CPU 1515SP PC2 SIPLUS ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and preinstalled SIMATIC S7-1500 Software Controller; 8 GB RAM, 30 GB CFast card **Type of delivery:** en, de, fr, es, it, zh	
• **SIPLUS ET 200SP CPU 1515SP PC2** For areas with exceptional exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C	**6AG1677-2DB42-2GB1**
• **SIPLUS ET 200SP CPU 1515SP PC2 Spare** Spare part, without CFast card	**6AG1677-2DB40-2AA0**
Accessories	
BA 2xRJ45 BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AR00-7AA0**
SIPLUS BA 2xFC BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AF00-7AA0**
BA 2xSCRJ BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AP00-2AA0**
BA 2xLC BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AG00-2AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC CPU 1515SP PC2

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Technical specifications

Article number	6AG1677-2DB40-2AA0 SIPLUS ET 200SP CPU1515SP PC2	6AG1677-2DB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2
General information		
Product type designation	CPU 1515SP PC2	CPU 1515SP PC2
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Installed software		
• Visualization	No	No
• Control	No	S7-1500 Software Controller CPU 1505SP
Supply voltage		
Rated value (DC)	24 V	24 V
Processor		
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores	Intel Atom E3940, 1.6 GHz, 4 cores
Storage		
Type of memory	DDR3L	DDR3L
Main memory	8 GB RAM	8 GB RAM
CFast memory card	No	Yes; 128 GB flash memory
Work memory		
• integrated (for program)		2 Mbyte
• integrated (for data)		7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)		20 Mbyte
Load memory		
• integrated (on PC mass storage)		320 Mbyte
Counters, timers and their retentivity		
S7 counter		
• Number		2 048
IEC counter		
• Number		Any (only limited by the main memory)
S7 timer		
• Number		2 048
IEC timer		
• Number		Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.		16 kbyte
Address area		
I/O address area		
• Inputs		32 kbyte; All inputs are in the process image
• Outputs		32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)		Yes; Resolution: 1 s

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Technical specifications (continued)

Article number	6AG1677-2DB40-2AA0 SIPLUS ET 200SP CPU1515SP PC2	6AG1677-2DB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2
1. Interface		
Interface type	PROFINET	PROFINET
Number of connections		88
Interface types		
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)		Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
Protocols		
• IP protocol		Yes; IPv4
• PROFINET IO Controller		Yes
• PROFINET IO device		Yes
• SIMATIC communication		Yes
• Open IE communication		Yes; Optionally also encrypted
• Web server		Yes
PROFINET IO Controller		
- Services		
- Isochronous mode		Yes
- Direct data exchange		Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse		500 µs
- IRT		Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy		Yes
- Prioritized startup		Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.		128
- Of which IO devices with IRT, max.		64
- of which in line, max.		64
- Number of connectable IO Devices for RT, max.		128
- of which in line, max.		128
- Number of IO Devices that can be simultaneously activated/deactivated, max.		8
- IO Devices changing during operation (partner ports), supported		Yes
- Number of IO Devices per tool, max.		8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.		8 kbyte
- Outputs, max.		8 kbyte
PROFINET IO Device		

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Technical specifications (continued)

Article number	6AG1677-2DB40-2AA0 SIPLUS ET 200SP CPU1515SP PC2	6AG1677-2DB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2
- Services		
- Isochronous mode		No
- IRT		Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy		Yes; per user program
- Prioritized startup		Yes
- Shared device		Yes
- Number of IO Controllers with shared device, max.		4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record		Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface type		Integrated Ethernet interface
Interface types		
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No
• Number of ports	1	1
3. Interface		
Interface type		PROFIBUS with CM DP
Number of connections		44
Interface types		
• RS 485		Yes
Protocols		
• PROFIBUS DP master		Yes
• PROFIBUS DP device		Yes
• SIMATIC communication		Yes
PROFIBUS DP master		
• max. number of DP devices		125
Protocols		
Number of connections		
• Number of connections, max.		88
Redundancy mode		
- Media redundancy		
- Media redundancy		Yes; only via BusAdapter
- MRP		Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported		Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD		Yes; Requirement: IRT
- Switchover time on line break, typ.		200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.		50
SIMATIC communication		
• S7 routing		Yes
OPC UA		
• OPC UA Client		Yes; Data access (read, write), method call
• OPC UA Server		Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions		Yes

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Technical specifications (continued)

Article number	6AG1677-2DB40-2AA0 SIPLUS ET 200SP CPU1515SP PC2	6AG1677-2DB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2
Supported technology objects		
Motion Control		Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects		2 400
• Required Motion Control resources		
- per speed-controlled axis		40
- per positioning axis		80
- per synchronous axis		160
- per external encoder		80
- per output cam		20
- per cam track		160
- per probe		40
Controller		
• PID_Compact		Yes; Universal PID controller with integrated optimization
• PID_3Step		Yes; PID controller with integrated optimization for valves
• PID-Temp		Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; from 55 °C: with max. 32 ET 200SP modules and 4x 500 mA USB load; from 60 °C with max. 16 ET 200SP modules, max. 4x 100 mA USB load, no visualization and projected empty space between CPU and ET 200SP module
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load	50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *

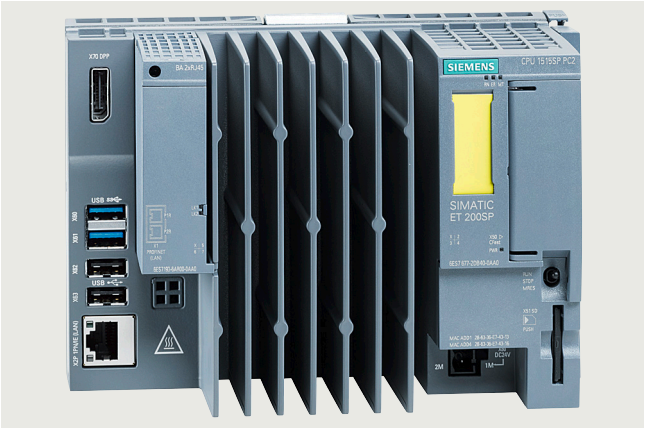
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Technical specifications (continued)

Article number	6AG1677-2DB40-2AA0 SIPLUS ET 200SP CPU1515SP PC2	6AG1677-2DB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Operating systems		
pre-installed operating system		Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI
Configuration		
Know-how protection		
• User program protection/password protection		Yes
• Copy protection		Yes
• Block protection		Yes
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection		Yes
• Protection level: Read/write protection		Yes
• Protection level: Complete protection		Yes
• User administration		Yes; device-wide
• Number of users		100
Open Development interfaces		
• Size of ODK SO file, max.		5.8 Mbyte
Peripherals/Options		
SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	0.83 kg	0.83 kg

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Overview



SIPLUS ET 200SP Open Controller, SIPLUS CPU 1515SP PC2 F, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the SIPLUS ET 200SP system, the SIPLUS S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a SIPLUS ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS ET 200SP Open Controller CPU 1515SP PC2 F (Extended temperature range and exposure to environmental substances) 8 GB RAM, 128 GB CFast with Windows 10 IoT Enterprise 64-bit and S7-1500 Failsafe Software Controller CPU 1505SP F preinstalled, interfaces: 1x slot CFast, 1x slot SD/MMC, 1x connector for ET 200SP BusAdapter PROFINET, 1x 10/100/1000 Mbps Ethernet, 2x USB 3.0; 2x USB 2.0, 1x DisplayPort, documentation on CFast, restore image on CFast	
• **SIPLUS CPU 1515SP PC2 F**	**6AG1677-2SB42-2GB1**
Accessories	
BA 2xRJ45 BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AR00-7AA0**
SIPLUS BA 2xFC BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AF00-7AA0**
BA 2xSCRJ BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AP00-2AA0**
BA 2xLC BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AG00-2AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC CPU 1515SP PC2 F

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Technical specifications

Article number	6AG1677-2SB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2 F
General information	
Product type designation	CPU 1515SP PC2 F
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP F
Supply voltage	
Rated value (DC)	24 V
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Storage	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 128 GB flash memory
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s

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Technical specifications (continued)

Article number	6AG1677-2SB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2 F
1. Interface	
Interface type	PROFINET
Number of connections	88
Interface types	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6AG1677-2SB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2 F
2. Interface	
Interface type	Integrated Ethernet interface
Interface types	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
3. Interface	
Interface type	PROFIBUS with CM DP
Number of connections	44
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125
Protocols	
Number of connections	
• Number of connections, max.	88
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

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Technical specifications (continued)

Article number	6AG1677-2SB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2 F
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; from 55 °C: with max. 32 ET 200SP modules and 4x 500 mA USB load; from 60 °C with max. 16 ET 200SP modules, max. 4x 100 mA USB load, no visualization and projected empty space between CPU and ET 200SP module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2021 LTSC

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Technical specifications (continued)

Article number	6AG1677-2SB42-2GB1 SIPLUS ET 200SP CPU 1515SP PC2 F
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

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Overview



- CPU 1513pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements on the program scope and processing speed, for distributed setup via PROFINET IO.
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of SIMATIC ET 200pro to third-party devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

CPU 1513pro-2 PN	
600 KB work memory for program, 2.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required	**6ES7513-2PM03-0AB0**
Accessories	
SIMATIC Memory Card	
4 MB[1)]	**6ES7954-8LC04-0AA0**
12 MB[1)]	**6ES7954-8LE04-0AA0**
24 MB[1)]	**6ES7954-8LF04-0AA0**
256 MB[1)]	**6ES7954-8LL04-0AA0**
2 GB[1)]	**6ES7954-8LP04-0AA0**
32 GB[1)]	**6ES7954-8LT04-0AA0**
Connection module	**6ES7194-4AP00-0AA0**
CM CPU 2PN M12 / 7/8"; With 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET	
Industrial Ethernet FC RJ45 plug 180	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**

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Selection and ordering data (continued)

M12-180/M12-180 IE connecting cable	
• Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP65/IP67, in various lengths:	
• 0.3 m	**6XV1870-8AE30**
• 0.5 m	**6XV1870-8AE50**
• 1.0 m	**6XV1870-8AH10**
• 1.5 m	**6XV1870-8AH15**
• 2.0 m	**6XV1870-8AH20**
• 3.0 m	**6XV1870-8AH30**
• 5.0 m	**6XV1870-8AH50**
• 10 m	**6XV1870-8AN10**
• 15 m	**6XV1870-8AN15**
• 20 m	**6XV1870-8AN20**
• 30 m	**6XV1870-8AN30**
• 40 m	**6XV1870-8AN40**
• 50 m	**6XV1870-8AN50**
• PROFINET M12 trailable connecting cable, preassembled at both ends with angled M12 plugs (contact pin insert), in various lengths:	
• 3.0 m	**3RK1902-2NB30**
• 5.0 m	**3RK1902-2NB50**
• 10 m	**3RK1902-2NC10**
• PROFINET M12 trailable connecting cable, preassembled at one end with angled M12 plug (contact pin at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-2HB30**
• 5.0 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
IE FC M12 plug PRO PROFINET M12 plug connector, D-coded with quick-connect technology, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled.	**3RK1902-2DA00**
IE panel feedthrough Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	**6GK1901-0DM20-2AA5**

Selection and ordering data (continued)

7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
• 1.5 m	**6XV1822-5BH15**
• 2.0 m	**6XV1822-5BH20**
• 3.0 m	**6XV1822-5BH30**
• 5.0 m	**6XV1822-5BH50**
• 10 m	**6XV1822-5BN10**
• 15 m	**6XV1822-5BN15**
• Other special lengths with 90° or 180° cable outlet.	See under this link.
• Trailable power cable, 5 x 1.5 mm², preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths:	
• 3.0 m	**3RK1902-3NB30**
• 5.0 m	**3RK1902-3NB50**
• 10 m	**3RK1902-3NC10**
• Trailable power cable, 5 x 1.5 mm², preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-3GB30**
• 5.0 m	**3RK1902-3GB50**
• 10 m	**3RK1902-3GC10**
Power cable 5-wire, 5 x 1.5 mm², trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	**6XV1830-8AH10**
7/8" connection plug For ET 200eco, with axial cable outlet	
• With contact pin insert, 5-pack	**6GK1905-0FA00**
• With socket insert, 5-pack	**6GK1905-0FB00**
• Angled, with socket insert, 1 unit	**3RK1902-3DA00**
• Angled, with contact pin insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**
Twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**
M12 sealing caps with internal thread 5 units	**6ES7194-4JD60-0AA0**

[1] An MMC is essential for operating the CPU

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Technical specifications

Article number	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
General information	
Product type designation	CPU 1513pro-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7513-2PL00-0AB0
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	2.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
2. Interface	
Interface types	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C

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Technical specifications (continued)

Article number	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; without connection module M12 7/8 inch
Weights	
Weight, approx.	474 g; device only

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Overview



- CPU 1516pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of SIMATIC ET 200pro to third-party devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU

Selection and ordering data

CPU 1516pro-2 PN	
2 MB work memory for program, 7.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC Memory Card required	**6ES7516-2PP03-0AB0**
Accessories	
SIMATIC Memory Card	
4 MB[1)]	**6ES7954-8LC04-0AA0**
12 MB[1)]	**6ES7954-8LE04-0AA0**
24 MB[1)]	**6ES7954-8LF04-0AA0**
256 MB[1)]	**6ES7954-8LL04-0AA0**
2 GB[1)]	**6ES7954-8LP04-0AA0**
32 GB[1)]	**6ES7954-8LT04-0AA0**
Connection module	**6ES7194-4AP00-0AA0**
CM CPU 2PN M12 / 7/8"; With 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET	
Industrial Ethernet FC RJ45 plug 180	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**

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Selection and ordering data (continued)

M12-180/M12-180 IE connecting cable	
• Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:	
• 0.3 m	**6XV1870-8AE30**
• 0.5 m	**6XV1870-8AE50**
• 1.0 m	**6XV1870-8AH10**
• 1.5 m	**6XV1870-8AH15**
• 2.0 m	**6XV1870-8AH20**
• 3.0 m	**6XV1870-8AH30**
• 5.0 m	**6XV1870-8AH50**
• 10 m	**6XV1870-8AN10**
• 15 m	**6XV1870-8AN15**
• 20 m	**6XV1870-8AN20**
• 30 m	**6XV1870-8AN30**
• 40 m	**6XV1870-8AN40**
• 50 m	**6XV1870-8AN50**
• PROFINET M12 trailable connecting cable, preassembled at both ends with angled M12 plugs (contact pin insert), in various lengths:	
• 3.0 m	**3RK1902-2NB30**
• 5.0 m	**3RK1902-2NB50**
• 10 m	**3RK1902-2NC10**
• PROFINET M12 trailable connecting cable, preassembled at one end with angled M12 plug (contact pin at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-2HB30**
• 5.0 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
IE FC M12 plug PRO	
PROFINET M12 plug connector, D-coded with quick-connect technology, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled.	**3RK1902-2DA00**
IE panel feedthrough	
Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	**6GK1901-0DM20-2AA5**

Selection and ordering data (continued)

7/8" connecting cable to power supply	
5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
• 1.5 m	**6XV1822-5BH15**
• 2.0 m	**6XV1822-5BH20**
• 3.0 m	**6XV1822-5BH30**
• 5.0 m	**6XV1822-5BH50**
• 10 m	**6XV1822-5BN10**
• 15 m	**6XV1822-5BN15**
• Other special lengths with 90° or 180° cable outlet.	See under this link.
• Trailable power cable, 5 x 1.5 mm², preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths:	
• 3.0 m	**3RK1902-3NB30**
• 5.0 m	**3RK1902-3NB50**
• 10 m	**3RK1902-3NC10**
• Trailable power cable, 5 x 1.5 mm², preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-3GB30**
• 5.0 m	**3RK1902-3GB50**
• 10 m	**3RK1902-3GC10**
Power cable	**6XV1830-8AH10**
5-wire, 5 x 1.5 mm², trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	
7/8" connection plug	
For ET 200eco, with axial cable outlet	
• With contact pin insert, 5-pack	**6GK1905-0FA00**
• With socket insert, 5-pack	**6GK1905-0FB00**
• Angled, with socket insert, 1 unit	**3RK1902-3DA00**
• Angled, with contact pin insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**
Twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**
M12 sealing cap	**3RX9802-0AA00**
For protection of unused M12 connections with ET 200pro	
M12 sealing caps with internal thread	**6ES7194-4JD60-0AA0**
5 units	

[1] An MMC is essential for operating the CPU

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Technical specifications

Article number	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
General information	
Product type designation	CPU 1516pro-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7516-2PN00-0AB0
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	2 Mbyte
• integrated (for data)	7.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
2. Interface	
Interface types	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C

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Technical specifications (continued)

Article number	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; without connection module M12 7/8 inch
Weights	
Weight, approx.	474 g; device only

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Overview



- Interface module for SIMATIC ET 200pro with integrated fail-safe CPU
- CPU with PLC functionality equivalent to CPU S7-315F PN/DP; with distributed intelligence for preprocessing
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and PL e according to ISO 13849.1:2006
- For high-performance control solutions in ET 200pro
- Increase in availability of systems and machines
- Integral web server with the option of creating user-defined web pages
- Isochronous mode on PROFIBUS or PROFINET
- PROFINET IO controller for up to 128 I/O devices
- PROFINET interface with integrated 3-port switch
- With multiple communication options:
  PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)

Note:
SIMATIC Micro Memory Card required for operation of CPU.

Selection and ordering data

IM 154-8 F PN/DP CPU interface module, V3.2	
Fail-safe PROFINET IO controller for operating distributed I/O on PROFINET, with integrated PLC functionality.	
• 512 KB work memory	**6ES7154-8FB01-0AB0**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP **Requirement:** Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; Email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V21	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA25-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA25-0YH5**
Accessories	
SIMATIC Micro Memory Cards	
MMC 64 KB [2] For program backup.	**6ES7953-8LF31-0AA0**
MMC 128 KB [2] For program backup.	**6ES7953-8LG31-0AA0**
MMC 512 KB [2] For program backup.	**6ES7953-8LJ31-0AA0**
MMC 2 MB [2] For program backup and/or firmware updates.	**6ES7953-8LL31-0AA0**
MMC 4 MB [2] For program backup.	**6ES7953-8LM32-0AA0**
MMC 8 MB [2] For program backup.	**6ES7953-8LP31-0AA0**

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Selection and ordering data (continued)

Industrial Ethernet FC RJ45 plug 90	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet.	
• 1 unit	**6GK1901-1BB20-2AA0**
• 10 units	**6GK1901-1BB20-2AB0**
Industrial Ethernet FC RJ45 plug 180	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**
M12-180/M12-180 IE connecting cable	
• Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP65/IP67, in various lengths:	
- 0.3 m	**6XV1870-8AE30**
- 0.5 m	**6XV1870-8AE50**
- 1.0 m	**6XV1870-8AH10**
- 15 m	**6XV1870-8AH15**
- 2.0 m	**6XV1870-8AH20**
- 3.0 m	**6XV1870-8AH30**
- 5.0 m	**6XV1870-8AH50**
- 10 m	**6XV1870-8AN10**
- 15 m	**6XV1870-8AN15**
- 20 m	**6XV1870-8AN20**
- 30 m	**6XV1870-8AN30**
- 40 m	**6XV1870-8AN40**
- 50 m	**6XV1870-8AN50**
• PROFINET M12 trailable connecting cable, preassembled at both ends with angled M12 plugs (contact pin insert), in various lengths:	
- 3.0 m	**3RK1902-2NB30**
- 5.0 m	**3RK1902-2NB50**
- 10 m	**3RK1902-2NC10**
• PROFINET M12 trailable connecting cable, preassembled at one end with angled M12 plug (contact pin at one end, other end open), in various lengths:	

Selection and ordering data (continued)

- 3.0 m	**3RK1902-2HB30**
- 5.0 m	**3RK1902-2HB50**
- 10 m	**3RK1902-2HC10**
IE FC M12 plug PRO	
PROFINET M12 plug connector, D-coded with quick-connect technology, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled	**3RK1902-2DA00**
IE panel feedthrough	
Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units	**6GK1901-0DM20-2AA5**
7/8" connecting cable to power supply	
• 5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
- 1.5 m	**6XV1822-5BH15**
- 2.0 m	**6XV1822-5BH20**
- 3.0	**6XV1822-5BH30**
- 5.0 m	**6XV1822-5BH50**
- 10 m	**6XV1822-5BN10**
- 15 m	**6XV1822-5BN15**
- Other special lengths with 90° or 180° cable outlet	See under this link.
• Trailable power cable, 5 x 1.5 mm², preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths:	
- 3.0 m	**3RK1902-3NB30**
- 5.0 m	**3RK1902-3NB50**
- 10 m	**3RK1902-3NC10**
• Trailable power cable, 5 x 1.5 mm², preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths:	
- 3.0 m	**3RK1902-3GB30**
- 5.0 m	**3RK1902-3GB50**
- 10 m	**3RK1902-3GC10**
Power cable	**6XV1830-8AH10**
5-wire, 5 x 1.5 mm², trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	
7/8" connection plug	
For ET 200eco, with axial cable outlet	
• With contact pin insert, 5-pack	**6GK1905-0FA00**
• With socket insert, 5-pack	**6GK1905-0FB00**
• Angled, with socket insert, 1 unit	**3RK1902-3DA00**
• Angled, with contact pin insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**

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Selection and ordering data (continued)

Twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**
M12 sealing caps with internal thread 5 units	**6ES7194-4JD60-0AA0**
PROFIBUS M12 connecting cable Preassembled, with two 5-pin M12 plugs/sockets, up to 100 m, in various lengths:	
1.5 m	**6XV1830-3DH15**
2.0 m	**6XV1830-3DH20**
3.0 m	**6XV1830-3DH30**
5.0 m	**6XV1830-3DH50**
10 m	**6XV1830-3DN10**
15 m	**6XV1830-3DN15**
Other special lengths with 90° or 180° cable outlet	See under this link.
M12 bus termination connector for PROFIBUS, socket insert	**6GK1905-0ED00**
M12 bus termination connector for PROFIBUS, pin insert	**6GK1905-0EC00**
M12 plug connector, axial outlet, with pin insert	**6GK1905-0EA00**
PROFIBUS FC standard cable GP Standard type with special design for quick mounting, 2-wire, shielded. Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0EH10**
PROFIBUS FC trailing cable 2-wire, shielded.	**6XV1830-3EH10**
PROFIBUS FC food cable 2-wire, shielded. Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC robust cable 2-wire, shielded. Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS M12 connection plug 5-pin, B-coded, metal enclosure, 1 pack = 5 units.	
• Socket insert	**6GK1905-0EB00**

1) Up-to-date information and download availability can be found at this link.
2) An MMC is essential for operating the CPU

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Technical specifications

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB
General information	
Product type designation	IM 154-8F PN/DP CPU
Engineering with	
• Programming package	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated	512 kbyte
• expandable	No
Load memory	
• Plug-in (MMC), max.	8 Mbyte
CPU processing times	
for bit operations, typ.	0.05 µs
for word operations, typ.	0.09 µs
for fixed point arithmetic, typ.	0.12 µs
for floating point arithmetic, typ.	0.45 µs
Counters, timers and their retentivity	
S7 counter	
• Number	256
IEC counter	
• Number	Unlimited (limited only by RAM capacity)
S7 timer	
• Number	256
IEC timer	
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
Flag	
• Size, max.	2 048 byte
Address area	
I/O address area	
• Inputs	2 048 byte
• Outputs	2 048 byte
Process image	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
Time of day	
Clock	
• Hardware clock (real-time)	Yes
1. Interface	
Interface type	Integrated RS 485 interface
Interface types	
• RS 485	Yes
Protocols	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• Point-to-point connection	No
PROFIBUS DP master	
• max. number of DP devices	124

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Technical specifications (continued)

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB
2. Interface	
Interface type	PROFINET
Interface types	
• Number of ports	3
• integrated switch	Yes
Protocols	
• MPI	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP device	No
• Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- PG/OP communication	Yes
- Isochronous mode	Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
- IRT	Yes
- Prioritized startup	Yes
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- PROFIenergy	Yes; With SFB 73 / 74 prepared for loadable PROFIenergy standard FB for I-Device
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Protocols	
Redundancy mode	
- Media redundancy	
- Switchover time on line break, typ.	200 ms; PROFINET MRP
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
S7 basic communication	
• supported	Yes
S7 communication	
• supported	Yes
Number of connections	
• overall	16

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Technical specifications (continued)

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB
Configuration	
Programming	
- Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
Know-how protection	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weights	
Weight, approx.	720 g

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Overview



- Fail-safe CPU 1513pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements on the program scope and processing speed, for distributed setup via PROFINET IO.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849.
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFIsafe in centralized and distributed configurations
- PROFINET shared I-device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of SIMATIC ET 200pro to third-party devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

CPU 1513pro F-2 PN	
900 KB work memory for program, 2.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required	**6ES7513-2GM03-0AB0**
Accessories	
SIMATIC Memory Card	
4 MB[1)]	**6ES7954-8LC04-0AA0**
12 MB[1)]	**6ES7954-8LE04-0AA0**
24 MB[1)]	**6ES7954-8LF04-0AA0**
256 MB[1)]	**6ES7954-8LL04-0AA0**
2 GB[1)]	**6ES7954-8LP04-0AA0**
32 GB[1)]	**6ES7954-8LT04-0AA0**
Connection module	**6ES7194-4AP00-0AA0**
CM CPU 2PN M12 / 7/8"; With 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET	
Industrial Ethernet FC RJ45 plug 180	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**

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Selection and ordering data (continued)

M12-180/M12-180 IE connecting cable	
Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:	
• 0.3 m	**6XV1870-8AE30**
• 0.5 m	**6XV1870-8AE50**
• 1.0 m	**6XV1870-8AH10**
• 1.5 m	**6XV1870-8AH15**
• 2.0 m	**6XV1870-8AH20**
• 3.0 m	**6XV1870-8AH30**
• 5.0 m	**6XV1870-8AH50**
• 10 m	**6XV1870-8AN10**
• 15 m	**6XV1870-8AN15**
• 20 m	**6XV1870-8AN20**
• 30 m	**6XV1870-8AN30**
• 40 m	**6XV1870-8AN40**
• 50 m	**6XV1870-8AN50**
PROFINET M12 trailable connecting cable, preassembled at both ends with angled M12 plugs (contact pin insert), in various lengths:	
• 3.0 m	**3RK1902-2NB30**
• 5.0 m	**3RK1902-2NB50**
• 10 m	**3RK1902-2NC10**
PROFINET M12 trailable connecting cable, preassembled at one end with angled M12 plug (contact pin at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-2HB30**
• 5.0 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
IE FC M12 plug PRO	
PROFINET M12 plug connector, D-coded with quick-connect technology, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled.	**3RK1902-2DA00**
IE panel feedthrough	
Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	**6GK1901-0DM20-2AA5**

Selection and ordering data (continued)

7/8" connecting cable to power supply	
5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
• 1.5 m	**6XV1822-5BH15**
• 2.0 m	**6XV1822-5BH20**
• 3.0 m	**6XV1822-5BH30**
• 5.0 m	**6XV1822-5BH50**
• 10 m	**6XV1822-5BN10**
• 15 m	**6XV1822-5BN15**
• Other special lengths with 90° or 180° cable outlet.	See under this link.
Trailable power cable, 5 x 1.5 mm², preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths:	
• 3.0 m	**3RK1902-3NB30**
• 5.0 m	**3RK1902-3NB50**
• 10 m	**3RK1902-3NC10**
Trailable power cable, 5 x 1.5 mm², preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-3GB30**
• 5.0 m	**3RK1902-3GB50**
• 10 m	**3RK1902-3GC10**
Power cable	**6XV1830-8AH10**
5-wire, 5 x 1.5 mm², trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	
7/8" connection plug	
For ET 200eco, with axial cable outlet	
• With contact pin insert, 5-pack	**6GK1905-0FA00**
• With socket insert, 5-pack	**6GK1905-0FB00**
• Angled, with socket insert, 1 unit	**3RK1902-3DA00**
• Angled, with contact pin insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**
Twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**
M12 sealing cap	**3RX9802-0AA00**
For protection of unused M12 connections with ET 200pro	
M12 sealing caps with internal thread	**6ES7194-4JD60-0AA0**
5 units	

[1] An MMC is essential for operating the CPU

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Technical specifications

Article number	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
General information	
Product type designation	CPU 1513pro F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7513-2GL00-0AB0
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	2.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
2. Interface	
Interface types	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C

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Technical specifications (continued)

Article number	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; without connection module M12 7/8 inch
Weights	
Weight, approx.	474 g; device only

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Overview



- Fail-safe CPU 1516pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516F-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA Server and Client (Data Access) as Runtime option for the easy connection of SIMATIC ET 200pro to third-party devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Selection and ordering data

CPU 1516pro F-2 PN	
3 MB work memory for program, 7.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC Memory Card required	**6ES7516-2GP03-0AB0**
Accessories	
SIMATIC Memory Card	
4 MB[1)]	**6ES7954-8LC04-0AA0**
12 MB[1)]	**6ES7954-8LE04-0AA0**
24 MB[1)]	**6ES7954-8LF04-0AA0**
256 MB[1)]	**6ES7954-8LL04-0AA0**
2 GB[1)]	**6ES7954-8LP04-0AA0**
32 GB[1)]	**6ES7954-8LT04-0AA0**
Connection module	**6ES7194-4AP00-0AA0**
CM CPU 2PN M12 / 7/8"; With 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET	
Industrial Ethernet FC RJ45 plug 180	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**

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Selection and ordering data (continued)

M12-180/M12-180 IE connecting cable	
Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:	
• 0.3 m	**6XV1870-8AE30**
• 0.5 m	**6XV1870-8AE50**
• 1.0 m	**6XV1870-8AH10**
• 1.5 m	**6XV1870-8AH15**
• 2.0 m	**6XV1870-8AH20**
• 3.0 m	**6XV1870-8AH30**
• 5.0 m	**6XV1870-8AH50**
• 10 m	**6XV1870-8AN10**
• 15 m	**6XV1870-8AN15**
• 20 m	**6XV1870-8AN20**
• 30 m	**6XV1870-8AN30**
• 40 m	**6XV1870-8AN40**
• 50 m	**6XV1870-8AN50**
PROFINET M12 trailable connecting cable, preassembled at both ends with angled M12 plugs (contact pin insert), in various lengths:	
• 3.0 m	**3RK1902-2NB30**
• 5.0 m	**3RK1902-2NB50**
• 10 m	**3RK1902-2NC10**
PROFINET M12 trailable connecting cable, preassembled at one end with angled M12 plug (contact pin at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-2HB30**
• 5.0 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
IE FC M12 plug PRO	
PROFINET M12 plug connector, D-coded with quick-connect technology, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled.	**3RK1902-2DA00**
IE panel feedthrough	
Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	**6GK1901-0DM20-2AA5**

Selection and ordering data (continued)

7/8" connecting cable to power supply	
5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
• 1.5 m	**6XV1822-5BH15**
• 2.0 m	**6XV1822-5BH20**
• 3.0 m	**6XV1822-5BH30**
• 5.0 m	**6XV1822-5BH50**
• 10 m	**6XV1822-5BN10**
• 15 m	**6XV1822-5BN15**
• Other special lengths with 90° or 180° cable outlet.	See under this link.
Trailable power cable, 5 x 1.5 mm², preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths:	
• 3.0 m	**3RK1902-3NB30**
• 5.0 m	**3RK1902-3NB50**
• 10 m	**3RK1902-3NC10**
Trailable power cable, 5 x 1.5 mm², preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-3GB30**
• 5.0 m	**3RK1902-3GB50**
• 10 m	**3RK1902-3GC10**
Power cable	**6XV1830-8AH10**
5-wire, 5 x 1.5 mm², trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	
7/8" connection plug	
For ET 200eco, with axial cable outlet	
• With contact pin insert, 5-pack	**6GK1905-0FA00**
• With socket insert, 5-pack	**6GK1905-0FB00**
• Angled, with socket insert, 1 unit	**3RK1902-3DA00**
• Angled, with contact pin insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**
Twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed twisted pair cables 4x2 with RJ45 plugs	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**
M12 sealing cap	**3RX9802-0AA00**
For protection of unused M12 connections with ET 200pro	
M12 sealing caps with internal thread	**6ES7194-4JD60-0AA0**
5 units	

[1] An MMC is essential for operating the CPU

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Technical specifications

Article number	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
General information	
Product type designation	CPU 1516pro F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7516-2GN00-0AB0
Supply voltage	
Rated value (DC)	24 V
Storage	
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
2. Interface	
Interface types	
• RJ 45 (Ethernet)	No
• Number of ports	1; 1x M12
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
Redundancy mode	
- Media redundancy	
- Media redundancy	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C

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Technical specifications (continued)

Article number	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; without connection module M12 7/8 inch
Weights	
Weight, approx.	474 g; device only

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8/2	**SIMATIC S7-1500 Software Controllers**
8/2	Standard CPUs
8/2	CPU 1507S Windows
8/10	CPU 1507S Linux
8/17	CPU 1508S Windows
8/25	CPU 1508S Linux
8/32	Fail-safe CPUs
8/32	CPU 1507S F Windows
8/40	CPU 1507S F Linux
8/47	CPU 1508S F Windows
8/55	CPU 1508S F Linux
8/62	Technology CPUs
8/62	CPU 1508S T
8/70	CPU 1508S TF
8/78	Add-on applications
8/78	ODK 1500S SQL driver
8/79	ODK 1500S XML Data Access driver
8/80	ODK 1500S FileServer
8/81	ODK 1500S SMX driver
8/82	ODK 1500S serial driver

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Overview



- SIMATIC S7-1500 Software Controller with Windows for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use as a PC-based controller in machines with distributed I/O via PROFINET
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET connections
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1507S (C/C++)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes (motion control functionalities require PROFINET IRT capability via CP 1625 and a PCIe slot on the IPC)
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA Server (Data Access) and Client as Runtime option for the easy connection of the SIMATIC S7-1500 Software Controller to Windows applications or third-party devices/systems

New in version V30.1

- Optimized for PC-based control tasks with the IPC BX-39A Microbox PC and the IPC PX-39A (Pro) Panel PC
- Support for the current IPC generation SIMATIC IPC227G and IPC277G (Pro)
- Can also be used on the IPC427E and IPC627E Box PCs, the IPC477E (Pro) and IPC677E Panel PCs, and the IPC647E and IPC847E Rack PCs
- Support of UEFI boot and M.2 SSD on all IPC platforms
- Improved commissioning:
  The resource allocation for the SIMATIC S7-1500 Software Controller, e.g. the interfaces used for PROFINET, is now set using a separate tool and no longer with the two-stage download from STEP 7. This permits a flexible choice of IPC without modifying the STEP 7 project

Overview (continued)

- Communication between Windows applications and the SIMATIC S7-1500 Software Controller is achieved via pure TCP/IP links. Communication with the SIMATIC S7-1500 Software Controller is possible directly through the PC interfaces on the Windows side ("bridging")
- No direct support from PROFIBUS, PROFIBUS support is only possible with an additional plug-in card.
- In order to use the SIMATIC S7-1500 Software Controller V30.1 instead of a previous version (e.g. V21.9), changes in configuration and installation are required.

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Selection and ordering data

SIMATIC S7-1500 Software Controller CPU 1507S For implementing the function of an S7-1500 Controller on SIMATIC IPCs **Target system:** Optimized for PC-based control tasks with IPC BX-39A Microbox PC and IPC PX-39A (Pro) Panel PC; Can also be used with IPC277G (Pro) Panel PC, IPC477E (Pro) Panel PC, IPC677E Panel PC, IPC227G Box PC, IPC427E Box PC, IPC627E Box PC, IPC647E Rack PC, IPC847E Rack PC **Requirement:** Windows 10 (64-bit) with UEFI boot; for supported Windows 10 version, see Technical specifications **Type of delivery:** en, de, fr, es, it, zh	
• Version V30.1 for Windows; Single license for one installation Software on DVD, license key on USB flash drive	**6ES7672-7AC02-0YA0**
• Version V30.1 for Windows; Single license for one installation; Software download including license key [1]	**6ES7672-7AC02-0YG0**
• Version V30.1 for Windows; Upgrade license for one installation; For upgrading existing installations with CPU 1507S Version 2; Software download including license key [1]	**6ES7672-7AC02-0YK0**
• Version V21.9; Single license for one installation; Software on DVD, license key on USB flash drive	**6ES7672-7AC01-0YA0**
• Version V21.9; Single license for one installation; Software download including license key [1]	**6ES7672-7AC01-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC BX-39A Microbox PC	**6AG4142-.....-....**
• SIMATIC IPC PX-39A Panel PC	**6AV7242-.....-....**
• SIMATIC IPC PX-39A Pro Panel PC	**6AV7252-.....-....**
• SIMATIC IPC227G Nanobox PC	**6ES7647-8C...-....**
• SIMATIC IPC277G Panel PC	**6AV7886-0....-....**
• SIMATIC IPC277G Pro Panel PC	**6AV7886-1....-....**
• SIMATIC IPC427E Microbox PC	**6AG4141-.....-....**
• SIMATIC IPC477E Panel PC	**6AV7241-.....-....**
• SIMATIC IPC477E Pro Panel PC	**6AV7251-.....-....**
• SIMATIC IPC627E Box PC	**6AG4131-3....-....**
• SIMATIC IPC677E Panel PC	**6AV7261-.....-....**
• SIMATIC IPC647E Rack PC	**6AG4112-3....-....**
• SIMATIC IPC847E Rack PC	**6AG4114-3....-....**
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS (can only be used with version V21.9)	**6GK1562-2AA00**

Selection and ordering data (continued)

CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP device, incl. PG and FDL protocols; single license for 1 installation, Runtime software, software and electronic manual on CD-ROM, Conformance Class A; for operating system support see SIMATIC NET software en/de (can only be used with version V21.9)	**6GK1562-3AA00**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-7AC01-0YA0 SIMATIC Software Controller CPU 1507S	6ES7672-7AC02-0YA0 SIMATIC Software Controller CPU 1507S
General information		
Product type designation	CPU 1507S	CPU 1507S
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V17	V20
Storage		
Work memory		
• integrated (for program)	5 Mbyte	5 Mbyte
• integrated (for data)	20 Mbyte	20 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte	50 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
CPU processing times		
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte	32 kbyte
• Outputs	32 kbyte	32 kbyte
Time of day		
Clock		
• Type	Software clock, synchronizable, no battery backup	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	6ES7672-7AC01-0YA0 SIMATIC Software Controller CPU 1507S	6ES7672-7AC02-0YA0 SIMATIC Software Controller CPU 1507S
1. Interface		
Interface type	CP 1625	CP 1625
Number of connections	128	128
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256	256
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device		
- Services		
- PG/OP communication	Yes	Yes

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Technical specifications (continued)

Article number	6ES7672-7AC01-0YA0 SIMATIC Software Controller CPU 1507S	6ES7672-7AC02-0YA0 SIMATIC Software Controller CPU 1507S
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)	Yes; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface type	Onboard PROFINET / IE interface X2/X3 of the SIMATIC IPC, Intel Springville i210T	Onboard PROFINET / IE interface X2/X3 of the SIMATIC IPC, Intel Springville i210T
Number of connections	128	128
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• PROFIBUS DP master		No
• PROFIBUS DP device		No
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		

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Technical specifications (continued)

Article number	6ES7672-7AC01-0YA0 SIMATIC Software Controller CPU 1507S	6ES7672-7AC02-0YA0 SIMATIC Software Controller CPU 1507S
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported		Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup		Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
- PROFINET Security Class		SNMP Configuration and DCP Read Only
3. Interface		
Interface type	PROFIBUS with CP 5622, CP 5622 onboard	
Number of connections	44	
Interface types		
• RS 485	Yes	
Protocols		
• PROFIBUS DP master	Yes	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes; no PG/STEP 7 connection possible	
PROFIBUS DP master		
• max. number of DP devices	64	

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Technical specifications (continued)

Article number	6ES7672-7AC01-0YA0 SIMATIC Software Controller CPU 1507S	6ES7672-7AC02-0YA0 SIMATIC Software Controller CPU 1507S
4. Interface		
Interface type	PROFIBUS with CP 5623	
Number of connections	44	
Interface types		
• RS 485	Yes	
Protocols		
• PROFIBUS DP master	Yes	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes; no PG/STEP 7 connection possible	
PROFIBUS DP master		
• max. number of DP devices	125	
Protocols		
Number of connections		
• Number of connections, max.	128	128
Redundancy mode		
- Media redundancy		
- MRP	Yes	Yes
- MRP interconnection, supported		Yes
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes; not via Windows interfaces
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800	4 800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes

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Technical specifications (continued)

Article number	6ES7672-7AC01-0YA0 SIMATIC Software Controller CPU 1507S	6ES7672-7AC02-0YA0 SIMATIC Software Controller CPU 1507S
Hardware requirement		
Hardware required	SIMATIC IPC2x7E, IPC4x7D/E, IPC6x7D/E, IPC8x7D/E	SIMATIC IPC227G, IPC277G (Pro), IPC427E, IPC477E (Pro), IPC BX-39A, IPC PX-39A (Pro), IPC627E, IPC677E, IPC647E, IPC847E
Processor		
• Single-core processor	No	No
• Single-core processor with hyper-threading	No	No
• Multi-core processor	Yes	Yes
• Multi-core processor with hyper-threading	Yes	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Storage		
• Work memory, min.	4 Gbyte	8 Gbyte
• Hard disk memory required for installation	720 Mbyte	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte	230 Mbyte
• Hard disk memory required at runtime	400 Mbyte	561 Mbyte
Operating systems		
Runs under operating system		
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit); Windows Embedded Standard 7 with delivery image of the SIMATIC IPC	No
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D, IPC8x7D; Windows 10 Enterprise 2019 LTSC 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7E, IPC8x7E	Yes; Windows 10 Enterprise 2019 LTSC and 2021 LTSC, 64-bit, MUI
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration		Yes
• Number of users		100
Open Development interfaces		
• Size of ODK SO file, max.	9.8 Mbyte	9.8 Mbyte

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Overview



- SIMATIC S7-1500 Software Controller V30.1 with Linux (Industrial OS 3.2.4 or higher) as operating system, for implementing the functions of a SIMATIC S7-1500 controller on SIMATIC IPC
- For use as a PC-based controller in machines with distributed I/O via PROFINET
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET connections
- Execution of functions and algorithms implemented with high-level languages (C++/Python) on Linux (Industrial OS 3.2.4 or higher) using the Realtime Information Backbone (RIB)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes (motion control functionalities require PROFINET IRT capability via CP 1625 and a PCIe slot on the IPC)
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA Server (Data Access) and Client as Runtime option for the easy connection of the SIMATIC S7-1500 Software Controller to Windows applications or third-party devices/systems

New in version V30.1: General Sales Release Linux (Industrial OS 3.2.4 or higher)

- Optimized for PC-based control tasks with the IPC BX-39A Microbox PC and the IPC PX-39A (Pro) Panel PC
- Support for the current IPC generation SIMATIC IPC227G and IPC277G (Pro)
- Can also be used on the Box PCs IPC427E and IPC627E, the Panel PCs IPC477E (Pro) and IPC677E, and the Rack PCs IPC647E and IPC847E
- Support of UEFI boot and M.2 SSD on all IPC platforms
- Improved commissioning:
  The resource allocation for the SIMATIC S7-1500 Software Controller, e.g. the interfaces used for PROFINET, is now set using a separate tool and no longer with the two-stage download from STEP 7. This permits a flexible choice of IPC without modifying the STEP 7 project

Overview (continued)

- Communication between Windows applications and the SIMATIC S7-1500 Software Controller is achieved via pure TCP/IP links. Communication with the SIMATIC S7-1500 Software Controller is possible directly through the PC interfaces on the Windows side ("bridging")
- No direct support from PROFIBUS, PROFIBUS support is only possible with an additional plug-in card.
- In order to use the SIMATIC S7-1500 Software Controller V30.1 instead of a previous version (e.g. V21.9), changes in configuration and installation are required.

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Selection and ordering data

SIMATIC S7-1500 Software Controller CPU 1507S For implementing the function of an S7-1500 Controller on SIMATIC IPCs with Linux as operating system (Industrial OS 3.2.4 or higher) **Target system:** Optimized for PC-based control tasks with IPC BX-39A Microbox PC and IPC PX-39A (Pro) Panel PC; Can also be used with IPC277G (Pro) Panel PC, IPC477E (Pro) Panel PC, IPC677E Panel PC, IPC227G Box PC, IPC427E Box PC, IPC627E Box PC, IPC647E Rack PC, IPC847E Rack PC **Requirement:** Linux (Industrial OS 3.2.4 or higher) with UEFI boot; For supported Linux version, see Technical specifications **Type of delivery:** en, de, fr, es, it, zh	
• Version V30.1 for Linux; Single license for one installation; software download including license key [1]	**6ES7672-7AD02-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC BX-39A Microbox PC	**6AG4142-.....-....**
• SIMATIC IPC PX-39A Panel PC	**6AV7242-.....-....**
• SIMATIC IPC PX-39A Pro Panel PC	**6AV7252-.....-....**
• SIMATIC IPC227G Nanobox PC	**6ES7647-8C...-....**
• SIMATIC IPC277G Panel PC	**6AV7886-0....-....**
• SIMATIC IPC277G Pro Panel PC	**6AV7886-1....-....**
• SIMATIC IPC427E Microbox PC	**6AG4141-.....-....**
• SIMATIC IPC477E Panel PC	**6AV7241-.....-....**
• SIMATIC IPC477E Pro Panel PC	**6AV7251-.....-....**
• SIMATIC IPC627E Box PC	**6AG4131-3....-....**
• SIMATIC IPC677E Panel PC	**6AV7261-.....-....**
• SIMATIC IPC647E Rack PC	**6AG4112-3....-....**
• SIMATIC IPC847E Rack PC	**6AG4114-3....-....**
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS (can only be used with version V21.9)	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP device, incl. PG and FDL protocols; single license for 1 installation, Runtime software, software and electronic manual on CD-ROM, Conformance Class A; for operating system support see SIMATIC NET software en/de (can only be used with version V21.9)	**6GK1562-3AA00**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-7AD02-0YG0 SIMATIC Soft. Control CPU 1507S Linux DL
General information	
Product type designation	CPU 1507S
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20
Storage	
Work memory	
• integrated (for program)	5 Mbyte
• integrated (for data)	20 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Software clock, synchronizable, no battery backup
1. Interface	
Interface type	CP 1625
Number of connections	128
Interface types	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7672-7AD02-0YG0 SIMATIC Soft. Control CPU 1507S Linux DL
- shortest clock pulse	500 µs
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-7AD02-0YG0 SIMATIC Soft. Control CPU 1507S Linux DL
2. Interface	
Interface type	Onboard PROFINET / IE interface X2/X3 of the SIMATIC IPC, Intel Springville i210T
Number of connections	128
Interface types	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	1
• integrated switch	No
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO device	Yes
• PROFIBUS DP master	No
• PROFIBUS DP device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
PROFIBUS DP master	
• max. number of DP devices	Profibus interface is not available.
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes

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Technical specifications (continued)

Article number	6ES7672-7AD02-0YG0 SIMATIC Soft. Control CPU 1507S Linux DL
Protocols	
Number of connections	
• Number of connections, max.	128
Redundancy mode	
- Media redundancy	
- MRP	Yes
- MRP interconnection, supported	Yes
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes; not via Linux interfaces
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Hardware requirement	
Hardware required	SIMATIC IPC2x7G, IPC4x7E, BX-39A, PX-39A
Processor	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Storage	
• Work memory, min.	8 Gbyte
• Hard disk memory required for installation	3 Gbyte
• Temporary hard disk memory for installation	300 Mbyte
• Hard disk memory required at runtime	1 700 Mbyte

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Technical specifications (continued)

Article number	6ES7672-7AD02-0YG0 SIMATIC Soft. Control CPU 1507S Linux DL
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
• User administration	Yes
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte

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Overview



- SIMATIC S7-1500 Software Controller with Windows for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use with control applications with increased requirements for program and data memory
- For use as a PC-based controller in machines with distributed I/O via PROFINET
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET connections
- Optimized for PC-based control tasks with the IPC627E Box PC, the IPC677E Panel PC, and the IPC647E and IPC847E Rack PCs
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1508S (C/C++)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes (motion control functionalities require PROFINET IRT capability via CP 1625 and a PCIe slot on the IPC)
- OPC UA Server (Data Access) and Client as Runtime option for the easy connection of the SIMATIC S7-1500 Software Controller to Windows applications or third-party devices/systems

New in V30.1

- Support for the current IPC generation SIMATIC IPC427E, IPC477E as well as SIMATIC IPC BX-39A and PX-39A
- Support of UEFI boot and M.2 SSD on all IPC platforms
- Improved commissioning:
  The resource allocation for the SIMATIC S7-1500 Software Controller, e.g. the interfaces used for PROFINET, is now set using a separate tool and no longer with the two-stage download from STEP 7. This permits a flexible choice of IPC without modifying the STEP 7 project
- Communication between Windows applications and the SIMATIC S7-1500 Software Controller is achieved via pure TCP/IP links. Communication with the SIMATIC S7-1500 Software Controller is possible directly through the PC interfaces on the Windows side ("bridging")

Overview (continued)

- No direct support from PROFIBUS, PROFIBUS support is only possible with an additional plug-in card
- In order to use the SIMATIC S7-1500 Software Controller V30.1 instead of a previous version (e.g. V21.9), changes in configuration and installation are required.

Selection and ordering data

SIMATIC S7-1500 Software Controller CPU 1508S For implementing the function of a SIMATIC S7-1500 Controller on a SIMATIC IPC **Target system:** Optimized for PC-based control tasks with: IPC677E Panel PC, IPC627E Box PC, IPC647E Rack PC, IPC847E Rack PC; Can also be used with: IPC477E Panel PC, IPC PX-39A Panel PC, IPC427E Box PC, IPC BX-39A Box PC; **Requirement:** Windows 10 (64-bit) with UEFI boot; For supported Windows 10 version, see Technical specifications **Type of delivery:** en, de, fr, es, it, zh	
• Version V30.1 for Windows; Single license for one installation Software on DVD, license key on USB flash drive	**6ES7672-8AC02-0YA0**
• Version V30.1 for Windows; Single license for one installation; Software download including license key [1]	**6ES7672-8AC02-0YG0**
• Version V30.1 for Windows; Upgrade license for one installation; For upgrading existing installations with CPU 1508S Version 2 Software download including license key [1]	**6ES7672-8AC02-0YK0**
• Version V21.9; Single license for one installation Software and documentation on DVD, license key on USB flash drive	**6ES7672-8AC01-0YA0**
• Version V21.9; Single license for one installation; Software download including license key [1]	**6ES7672-8AC01-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC627E Box PC	**6AG4131-3....-....**
• SIMATIC IPC677E Panel PC	**6AV7261-.....-....**
• SIMATIC IPC427E Microbox PC	**6AG4141-.....-....**
• SIMATIC IPC477E Panel PC	**6AV7241-.....-....**
• SIMATIC IPC BX-39A Microbox PC	**6AG4142-.....-....**
• SIMATIC IPC PX-39A Panel PC	**6AV7242-.....-....**
• SIMATIC IPC647E Rack PC	**6AG4112-3....-....**
• SIMATIC IPC847E Rack PC	**6AG4114-3....-....**
For more information, see Catalog ST 80 / ST PC	
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller	**6ES7648-2CF10-1AA0**

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Selection and ordering data (continued)

CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS (can only be used with version V21.9)	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP device, incl. PG and FDL protocols; single license for 1 installation, Runtime software, software and electronic manual on CD-ROM, Conformance Class A; for operating system support see SIMATIC NET software; en/de (can only be used with version V21.9)	**6GK1562-3AA00**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-8AC01-0YA0 SIMATIC Software Controller CPU 1508S	6ES7672-8AC02-0YA0 SIMATIC Software Controller CPU 1508S
General information		
Product type designation	CPU 1508S	CPU 1508S
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V17	V20
Storage		
Work memory		
• integrated (for program)	10 Mbyte	10 Mbyte
• integrated (for data)	100 Mbyte	100 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte	50 Mbyte
Load memory		
• integrated (on PC mass storage)	1 024 Mbyte	1 024 Mbyte
CPU processing times		
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte	32 kbyte
• Outputs	32 kbyte	32 kbyte
Time of day		
Clock		
• Type	Software clock, synchronizable, no battery backup	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	6ES7672-8AC01-0YA0 SIMATIC Software Controller CPU 1508S	6ES7672-8AC02-0YA0 SIMATIC Software Controller CPU 1508S
1. Interface		
Interface type	CP 1625	CP 1625
Number of connections	192	192
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy		Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256; the maximal amount of supported devices on all interfaces (PN/PB) is 384 in total	256; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.	16 kbyte	16 kbyte
- Outputs, max.	16 kbyte	16 kbyte
PROFINET IO Device		
- Services		

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Technical specifications (continued)

Article number	6ES7672-8AC01-0YA0 SIMATIC Software Controller CPU 1508S	6ES7672-8AC02-0YA0 SIMATIC Software Controller CPU 1508S
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Number of connections	192	192
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• PROFIBUS DP master		No
• PROFIBUS DP device		No
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		

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Technical specifications (continued)

Article number	6ES7672-8AC01-0YA0 SIMATIC Software Controller CPU 1508S	6ES7672-8AC02-0YA0 SIMATIC Software Controller CPU 1508S
- Services		
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384	128; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported		Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup		Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
- PROFINET Security Class		SNMP Configuration and DCP Read Only
3. Interface		
Interface type	PROFIBUS with CP 5622, CP 5622 onboard	
Number of connections	44	
Interface types		
• RS 485	Yes	
Protocols		
• PROFIBUS DP master	Yes	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes; no PG/STEP 7 connection possible	
PROFIBUS DP master		
• max. number of DP devices	64	

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Technical specifications (continued)

Article number	6ES7672-8AC01-0YA0 SIMATIC Software Controller CPU 1508S	6ES7672-8AC02-0YA0 SIMATIC Software Controller CPU 1508S
4. Interface		
Interface type	PROFIBUS with CP 5623	
Number of connections	44	
Interface types		
• RS 485	Yes	
Protocols		
• PROFIBUS DP master	Yes	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes; no PG/STEP 7 connection possible	
PROFIBUS DP master		
• max. number of DP devices	125	
Protocols		
Number of connections		
• Number of connections, max.	192	192
Redundancy mode		
- Media redundancy		
- MRP	Yes	Yes
- MRP interconnection, supported		Yes
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800	4 800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes

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Technical specifications (continued)

Article number	6ES7672-8AC01-0YA0 SIMATIC Software Controller CPU 1508S	6ES7672-8AC02-0YA0 SIMATIC Software Controller CPU 1508S
Hardware requirement		
Hardware required	SIMATIC IPC4x7E, IPC6x7D/E, IPC8x7D/E	SIMATIC IPC427E, IPC477E (Pro), IPC BX-39A, IPC PX-39A (Pro), IPC627E, IPC677E, IPC647E, IPC847E
Processor		
• Single-core processor	No	No
• Single-core processor with hyper-threading	No	No
• Multi-core processor	Yes	Yes
• Multi-core processor with hyper-threading	Yes	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Storage		
• Work memory, min.	8 Gbyte	8 Gbyte
• Hard disk memory required for installation	720 Mbyte	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte	230 Mbyte
• Hard disk memory required at runtime	1 000 Mbyte	1 661 Mbyte
Operating systems		
Runs under operating system		
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit); Windows Embedded Standard 7 with delivery image of the SIMATIC IPC	No
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D, IPC8x7D; Windows 10 Enterprise 2019 LTSC 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7E, IPC8x7E	Yes; Windows 10 Enterprise 2019 LTSC and 2021 LTSC, 64-bit, MUI
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration		Yes
• Number of users		100
Open Development interfaces		
• Size of ODK SO file, max.	9.8 Mbyte	9.8 Mbyte

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Overview



- The SIMATIC S7-1500 Software Controller with Linux (Industrial OS 3.2.4 or higher) as operating system, for implementing the functions of a SIMATIC S7-1500 controller on SIMATIC IPC
- For use with control applications with increased requirements for program and data memory
- For use as a PC-based controller in machines with distributed I/O via PROFINET
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET connections
- Optimized for PC-based control tasks with the IPC627E Box PC, the IPC677E Panel PC, and the IPC647E and IPC847E Rack PCs
- Execution of functions and algorithms implemented with high-level languages (C++, Python) on Linux (Industrial OS 3.2.4 or higher) using the Realtime Information Backbone (RIB)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes (motion control functionalities require PROFINET IRT capability via CP 1625 and a PCIe slot on the IPC)
- OPC UA Server (Data Access) and Client as Runtime option for the easy connection of the SIMATIC S7-1500 Software Controller to Linux applications or third-party devices/systems

New with V30.1, General Sales Release Linux (Industrial OS 3.2.4 or higher)

- Support for the current IPC generation SIMATIC IPC427E, IPC477E as well as SIMATIC IPC BX-39A and PX-39A
- Support of UEFI boot and M.2 SSD on all IPC platforms
- Improved commissioning:
  The resource allocation for the SIMATIC S7-1500 Software Controller, e.g. the interfaces used for PROFINET, is now set using a separate tool and no longer with the two-stage download from STEP 7. This permits a flexible choice of IPC without modifying the STEP 7 project

Overview (continued)

- Communication between Linux applications and the SIMATIC S7-1500 Software Controller is achieved via pure TCP/IP links. Communication with the SIMATIC S7-1500 Software Controller is possible directly through the PC interfaces on the Linux side ("bridging")
- No direct support from PROFIBUS, PROFIBUS support is only possible with an additional plug-in card
- In order to use the SIMATIC S7-1500 Software Controller V30.1 instead of a previous version (e.g. V21.9), changes in configuration and installation are required.

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Selection and ordering data

SIMATIC S7-1500 Software Controller CPU 1508S For implementing the function of a SIMATIC S7-1500 Controller on a SIMATIC IPC with Linux as operating system (Industrial OS 3.2.4 or higher) **Target system:** Optimized for PC-based control tasks with: IPC677E Panel PC, IPC627E Box PC, IPC647E Rack PC, IPC847E Rack PC; Can also be used with: IPC477E Panel PC, IPC PX-39A Panel PC, IPC427E Box PC, IPC BX-39A Box PC; **Requirement:** Linux (Industrial OS 3.2.4 or higher) with UEFI boot; **Type of delivery:** en, de, fr, es, it, zh	
• Version V30.1 for Linux; Single license for one installation; software download including license key [1]	**6ES7672-8AD02-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC627E Box PC	**6AG4131-3....-....**
• SIMATIC IPC677E Panel PC	**6AV7261-.....-....**
• SIMATIC IPC427E Microbox PC	**6AG4141-.....-....**
• SIMATIC IPC477E Panel PC	**6AV7241-.....-....**
• SIMATIC IPC BX-39A Microbox PC	**6AG4142-.....-....**
• SIMATIC IPC PX-39A Panel PC	**6AV7242-.....-....**
• SIMATIC IPC647E Rack PC	**6AG4112-3....-....**
• SIMATIC IPC847E Rack PC	**6AG4114-3....-....**
For more information, see Catalog ST 80 / ST PC	
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS (can only be used with version V21.9)	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP device, incl. PG and FDL protocols; single license for 1 installation, Runtime software, software and electronic manual on CD-ROM, Conformance Class A; for operating system support see SIMATIC NET software; en/de (can only be used with version V21.9)	**6GK1562-3AA00**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-8AD02-0YG0 SIMATIC Software Controller CPU 1508S DL
General information	
Product type designation	CPU 1508S
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20
Storage	
Work memory	
• integrated (for program)	10 Mbyte
• integrated (for data)	100 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
Load memory	
• integrated (on PC mass storage)	1 024 Mbyte
CPU processing times	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Software clock, synchronizable, no battery backup
1. Interface	
Interface type	CP 1625
Number of connections	192
Interface types	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7672-8AD02-0YG0 SIMATIC Software Controller CPU 1508S DL
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-8AD02-0YG0 SIMATIC Software Controller CPU 1508S DL
2. Interface	
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Number of connections	192
Interface types	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• PROFIBUS DP master	No
• PROFIBUS DP device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
PROFIBUS DP master	
• max. number of DP devices	Profibus interface is not available.
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-8AD02-0YG0 SIMATIC Software Controller CPU 1508S DL
Protocols	
Number of connections	
• Number of connections, max.	192
Redundancy mode	
- Media redundancy	
- MRP	Yes
- MRP interconnection, supported	Yes
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Hardware requirement	
Hardware required	SIMATIC IPC427E, IPC477E (Pro), IPC BX-39A, IPC PX-39A (Pro)
Processor	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Storage	
• Work memory, min.	8 Gbyte
• Hard disk memory required for installation	3 Gbyte
• Temporary hard disk memory for installation	300 Mbyte
• Hard disk memory required at runtime	1 700 Mbyte

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Technical specifications (continued)

Article number	6ES7672-8AD02-0YG0 SIMATIC Software Controller CPU 1508S DL
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
• User administration	Yes
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte

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Overview



- SIMATIC S7-1500 Software Controller with Windows as operating system for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use as a PC-based controller in machines with distributed I/O via PROFINET
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET connections
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Supports PROFIsafe in distributed configurations
- Can also be used on the IPC227G, IPC427E and IPC627E Box PCs, the IPC277G, IPC477E and IPC677E Panel PCs, and the IPC647E and IPC847E Rack PCs
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1507S F (C/C++)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes (motion control functionalities require PROFINET IRT capability via CP 1625 and a PCIe slot on the IPC)
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA Server (Data Access) and Client as Runtime option for the easy connection of the SIMATIC S7-1500 Software Controller to Windows applications or third-party devices/systems

Overview (continued)

New in version V30.1

- Support for new IPC generations
- Optimized for PC-based control tasks with the IPC BX-39A Microbox PC and the IPC PX-39A (Pro) Panel PC
- Support for the current IPC generation SIMATIC IPC227G and IPC277G
- Can also be used on the IPC427E and IPC627E Box PCs, the IPC477E (Pro) and IPC677E Panel PCs, and the IPC647E and IPC847E Rack PCs
- Support of UEFI boot and M.2 SSD on all IPC platforms
- Improved commissioning:
  The resource allocation for the SIMATIC S7-1500 Software Controller, e.g. the interfaces used for PROFINET, is now set using a separate tool and no longer with the two-stage download from STEP 7. This permits a flexible choice of IPC without modifying the STEP 7 project
- Communication between Windows applications and the SIMATIC S7-1500 Software Controller is achieved via pure TCP/IP links. Communication with the SIMATIC S7-1500 Software Controller is possible directly through the PC interfaces on the Windows side ("bridging")
- Safety functions possible on IPC without NVRAM
- No direct support from PROFIBUS, PROFIBUS support is only possible with an additional plug-in card.
- In order to use the SIMATIC S7-1500 Software Controller V30.1 instead of a previous version (e.g. V21.9), changes in the configuration and installation are required.

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Selection and ordering data

SIMATIC S7-1500 Software Controller CPU 1507S F For implementing the function of a fail-safe S7-1500 Controller on SIMATIC IPCs **Target system:** Optimized for PC-based control tasks with IPC BX-39A Microbox PC and IPC PX-39A (Pro) Panel PC; Can also be used with IPC277G (Pro) Panel PC, IPC477E (Pro) Panel PC, IPC677E Panel PC, IPC227G Box PC, IPC427E Box PC, IPC627E Box PC, IPC647E Rack PC, IPC847E Rack PC. **Requirement:** Windows 10 (64-bit) with UEFI boot; For supported Windows 10 versions, see Technical specifications; For optimum fail-safe operation, IPC configurations with NVRAM are recommended (requirement for use of version V21.9). **Type of delivery:** en, de, fr, es, it, zh	
• Version V30.1 for Windows; Single license for one installation Software on DVD, license key on USB flash drive	**6ES7672-7FC02-0YA0**
• Version V30.1 for Windows; Single license for one installation; Software download including license key [1]	**6ES7672-7FC02-0YG0**
• Version V30.1 for Windows; Upgrade license for one installation. For upgrading existing installations with CPU 1507S F Version 2; Software download including license key [1]	**6ES7672-7FC02-0YK0**
• Version V21.9; Single license for one installation Software on DVD, license key on USB flash drive; Note: for safety functions, IPC with NVRAM are absolutely necessary	**6ES7672-7FC01-0YA0**
• Version V21.9; Single license for one installation; Software download including license key [1] Note: for safety functions, IPC with NVRAM are absolutely necessary	**6ES7672-7FC01-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC BX-39A Microbox PC	**6AG4142-.....-....**
• SIMATIC IPC PX-39A Panel PC	**6AV7242-.....-....**
• SIMATIC IPC PX-39A Pro Panel PC	**6AV7252-.....-....**
• SIMATIC IPC227G Nanobox PC	**6ES7647-8C...-....**
• SIMATIC IPC277G Panel PC	**6AV7886-0....-....**
• SIMATIC IPC277G Pro Panel PC	**6AV7886-1....-....**
• SIMATIC IPC427E Microbox PC	**6AG4141-.....-....**
• SIMATIC IPC477E Panel PC	**6AV7241-.....-....**
• SIMATIC IPC477E Pro Panel PC	**6AV7251-.....-....**
• SIMATIC IPC627E Box PC	**6AG4131-3....-....**
• SIMATIC IPC677E Panel PC	**6AV7261-.....-....**
• IPC647E Rack PC	**6AG4112-3....-....**
• IPC847E Rack PC	**6AG4114-3....-....**
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller	**6ES7648-2CF10-1AA0**

Selection and ordering data (continued)

CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS (can only be used with version V21.9)	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP device, incl. PG and FDL protocols; single license for 1 installation, Runtime software, software and electronic manual on CD-ROM, Conformance Class A; for operating system support see SIMATIC NET software; en/de (can only be used with version V21.9)	**6GK1562-3AA00**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-7FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F	6ES7672-7FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F
General information		
Product type designation	CPU 1507S F	CPU 1507S F
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V17	V20
Storage		
Work memory		
• integrated (for program)	7.5 Mbyte	7.5 Mbyte
• integrated (for data)	20 Mbyte	20 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte	50 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
CPU processing times		
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte	32 kbyte
• Outputs	32 kbyte	32 kbyte
Time of day		
Clock		
• Type	Software clock, synchronizable, no battery backup	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	6ES7672-7FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F	6ES7672-7FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F
1. Interface		
Interface type	CP 1625	CP 1625
Number of connections	128	128
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy		Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256	256
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device		
- Services		
- PG/OP communication	Yes	Yes

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Technical specifications (continued)

Article number	6ES7672-7FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F	6ES7672-7FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)	Yes; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface type	Onboard PROFINET / IE interface X2/X3 of the SIMATIC IPC, Intel Springville i210T	Onboard PROFINET / IE interface X2/X3 of the SIMATIC IPC, Intel Springville i210T
Number of connections	128	128
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• PROFIBUS DP master		No
• PROFIBUS DP device		No
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		

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Technical specifications (continued)

Article number	6ES7672-7FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F	6ES7672-7FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported		Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup		Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
3. Interface		
Interface type	PROFIBUS with CP 5622, CP 5622 onboard	
Number of connections	44	
Interface types		
• RS 485	Yes	
Protocols		
• PROFIBUS DP master	Yes	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes; no PG/STEP 7 connection possible	
PROFIBUS DP master		
• max. number of DP devices	64	
4. Interface		
Interface type	PROFIBUS with CP 5623	
Number of connections	44	
Interface types		
• RS 485	Yes	
Protocols		
• PROFIBUS DP master	Yes	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes; no PG/STEP 7 connection possible	
PROFIBUS DP master		
• max. number of DP devices	125	

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Technical specifications (continued)

Article number	6ES7672-7FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F	6ES7672-7FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F
Protocols		
Number of connections		
• Number of connections, max.	128	128
Redundancy mode		
- Media redundancy		
- MRP	Yes	Yes
- MRP interconnection, supported		Yes
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes; not via Windows interfaces
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800	4 800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Hardware requirement		
Hardware required	SIMATIC IPC2x7E, IPC4x7D/E, IPC627D, IPC677D, IPC827D: configurations with NVRAM required; IPC6x7E, IPC8x7E	SIMATIC IPC227G, IPC277G (Pro), IPC427E, IPC477E (Pro), IPC BX-39A, IPC PX-39A (Pro), IPC627E, IPC677E, IPC647E, IPC847E
Processor		
• Single-core processor	No	No
• Single-core processor with hyper-threading	No	No
• Multi-core processor	Yes	Yes
• Multi-core processor with hyper-threading	Yes	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Storage		
• Work memory, min.	4 Gbyte	8 Gbyte
• Hard disk memory required for installation	720 Mbyte	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte	230 Mbyte
• Hard disk memory required at runtime	400 Mbyte	561 Mbyte

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Technical specifications (continued)

Article number	6ES7672-7FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F	6ES7672-7FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1507S F
Operating systems		
Runs under operating system		
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit); Windows Embedded Standard 7 with delivery image of the SIMATIC IPC	No
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D, IPC8x7D; Windows 10 Enterprise 2019 LTSC 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7E, IPC8x7E	Yes; Windows 10 Enterprise 2019 LTSC and 2021 LTSC, 64-bit, MUI
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration		Yes
• Number of users		100
Open Development interfaces		
• Size of ODK SO file, max.	9.8 Mbyte	9.8 Mbyte

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Overview



- SIMATIC S7-1500 Software Controller V30.1 with Linux (Industrial OS 3.2.4 or higher) as operating system for implementing the functions of a SIMATIC S7-1500 Controller on SIMATIC IPC
- Use as a PC-based SIMATIC controller in machines with distributed I/O via PROFINET
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET connections
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Supports PROFIsafe in distributed configurations
- Can also be used on the IPC227G, IPC427E and IPC627E Box PCs, the IPC277G, IPC477E and IPC677E Panel PCs, and the IPC647E and IPC847E Rack PCs
- Execution of functions and algorithms implemented with high-level languages (C++/Python) on Linux (Industrial OS 3.2.4 or higher) using the Realtime Information Backbone (RIB)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes (motion control functionalities require PROFINET IRT capability via CP 1625 and a PCIe slot on the IPC)
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA Server (Data Access) and Client as Runtime option for the easy connection of the SIMATIC S7-1500 Software Controller to Linux applications or third-party devices/systems

Overview (continued)

New in version V30.1: General Sales Release Linux (Industrial OS 3.2.4 or higher)

- Support for new IPC generations
- Optimized for PC-based control tasks with the IPC BX-39A Microbox PC and the IPC PX-39A (Pro) Panel PC
- Support for the current IPC generation SIMATIC IPC227G and IPC277G
- Can also be used on the IPC427E and IPC627E Box PCs, the IPC477E (Pro) and IPC677E Panel PCs, and the IPC647E and IPC847E Rack PCs
- Support of UEFI boot and M.2 SSD on all IPC platforms
- Improved commissioning:
  The resource allocation for the SIMATIC S7-1500 Software Controller, e.g. the interfaces used for PROFINET, is now set using a separate tool and no longer with the two-stage download from STEP 7. This permits a flexible choice of IPC without modifying the STEP 7 project
- Communication between Linux applications and the SIMATIC S7-1500 Software Controller is achieved via pure TCP/IP links. Communication with the SIMATIC S7-1500 Software Controller is possible directly through the PC interfaces on the Linux side ("bridging")
- Safety functions possible on IPC without NVRAM
- No direct support from PROFIBUS, PROFIBUS support is only possible with an additional plug-in card.
- In order to use the SIMATIC S7-1500 Software Controller V30.1 instead of a previous version (e.g. V21.9), changes in the configuration and installation are required.

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Selection and ordering data

SIMATIC S7-1500 Software Controller CPU 1507S F For implementing the function of a fail-safe S7-1500 Controller on SIMATIC IPCs with Linux as operating system (Industrial OS 3.2.4 or higher) **Target system:** Optimized for PC-based control tasks with IPC BX-39A Microbox PC and IPC PX-39A (Pro) Panel PC; Can also be used with IPC277G (Pro) Panel PC, IPC477E (Pro) Panel PC, IPC677E Panel PC, IPC227G Box PC, IPC427E Box PC, IPC627E Box PC, IPC647E Rack PC, IPC847E Rack PC. **Requirement:** Linux (Industrial OS 3.2.4 or higher) with UEFI boot; For supported Linux versions, see Technical specifications; For optimal fail-safe operation, IPC configurations with NVRAM are recommended **Type of delivery:** en, de, fr, es, it, zh	
• Version V30.1 for Linux; Single license for one installation; software download including license key [1]	**6ES7672-7FD02-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC BX-39A Microbox PC	**6AG4142-.....-....**
• SIMATIC IPC PX-39A Panel PC	**6AV7242-.....-....**
• SIMATIC IPC PX-39A Pro Panel PC	**6AV7252-.....-....**
• SIMATIC IPC227G Nanobox PC	**6ES7647-8C...-....**
• SIMATIC IPC277G Panel PC	**6AV7886-0....-....**
• SIMATIC IPC277G Pro Panel PC	**6AV7886-1....-....**
• SIMATIC IPC427E Microbox PC	**6AG4141-.....-....**
• SIMATIC IPC477E Panel PC	**6AV7241-.....-....**
• SIMATIC IPC477E Pro Panel PC	**6AV7251-.....-....**
• SIMATIC IPC627E Box PC	**6AG4131-3....-....**
• SIMATIC IPC677E Panel PC	**6AV7261-.....-....**
• IPC647E Rack PC	**6AG4112-3....-....**
• IPC847E Rack PC	**6AG4114-3....-....**
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS (can only be used with version V21.9)	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP device, incl. PG and FDL protocols; single license for 1 installation, Runtime software, software and electronic manual on CD-ROM, Conformance Class A; for operating system support see SIMATIC NET software; en/de (can only be used with version V21.9)	**6GK1562-3AA00**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-7FD02-0YG0 SIMATIC SW Ctrl CPU 1507S F Linux DL
General information	
Product type designation	CPU 1507S F
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20
Storage	
Work memory	
• integrated (for program)	7.5 Mbyte
• integrated (for data)	20 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Software clock, synchronizable, no battery backup
1. Interface	
Interface type	CP 1625
Number of connections	128
Interface types	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)

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Technical specifications (continued)

Article number	6ES7672-7FD02-0YG0 SIMATIC SW Ctrl CPU 1507S F Linux DL
- shortest clock pulse	500 µs
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-7FD02-0YG0 SIMATIC SW Ctrl CPU 1507S F Linux DL
2. Interface	
Interface type	Onboard PROFINET / IE interface X2/X3 of the SIMATIC IPC, Intel Springville i210T
Number of connections	128
Interface types	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	1
• integrated switch	No
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• PROFIBUS DP master	No
• PROFIBUS DP device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
PROFIBUS DP master	
• max. number of DP devices	Profibus interface is not available.
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-7FD02-0YG0 SIMATIC SW Ctrl CPU 1507S F Linux DL
Protocols	
Number of connections	
• Number of connections, max.	128
Redundancy mode	
- Media redundancy	
- MRP	Yes
- MRP interconnection, supported	Yes
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes; not via Linux interfaces
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Hardware requirement	
Hardware required	SIMATIC IPC227G, IPC277G (Pro), IPC427E, IPC477E (Pro), IPC BX-39A, IPC PX-39A (Pro)
Processor	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Storage	
• Work memory, min.	8 Gbyte
• Hard disk memory required for installation	3 Gbyte
• Temporary hard disk memory for installation	300 Mbyte
• Hard disk memory required at runtime	1 700 Mbyte

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Technical specifications (continued)

Article number	6ES7672-7FD02-0YG0 SIMATIC SW Ctrl CPU 1507S F Linux DL
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte

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Overview



- SIMATIC S7-1500 Software Controller with Windows as operating system for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use with control applications with increased requirements for program and data memory
- For use as a PC-based controller in machines with distributed I/O via PROFINET
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET connections
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Supports PROFIsafe in distributed configurations
- Optimized for PC-based control tasks with the IPC627E Box PC, the IPC677E Panel PC, and the IPC647E and IPC847E Rack PCs
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1508S F (C/C++)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes (motion control functionalities require PROFINET IRT capability via CP 1625 and a PCIe slot on the IPC)
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA Server (Data Access) and Client as Runtime option for the easy connection of the SIMATIC S7-1500 Software Controller to Windows applications or third-party devices/systems

Overview (continued)

New in version V30.1

- Support for the current IPC generation SIMATIC IPC427E, IPC477E as well as SIMATIC IPC BX-39A and PX-39A
- Support of UEFI boot and M.2 SSD on all IPC platforms
- Improved commissioning:
  The resource allocation for the SIMATIC S7-1500 Software Controller, e.g. the interfaces used for PROFINET, is now set using a separate tool and no longer with the two-stage download from STEP 7. This permits a flexible choice of IPC without modifying the STEP 7 project
- Communication between Windows applications and the SIMATIC S7-1500 Software Controller is achieved via pure TCP/IP links. Communication with the SIMATIC S7-1500 Software Controller is possible directly through the PC interfaces on the Windows side ("bridging")
- Safety functions possible on IPC without NVRAM
- No direct support from PROFIBUS, PROFIBUS support is only possible with an additional plug-in card
- In order to use the SIMATIC S7-1500 Software Controller V30.1 instead of a previous version (e.g. V21.9), changes in the configuration and installation are required.

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Selection and ordering data

SIMATIC S7-1500 Software Controller CPU 1508S F For implementing the function of a fail-safe S7-1500 Controller on a SIMATIC IPC **Target system:** Optimized for PC-based control tasks with: IPC677E Panel PC, IPC627E Box PC, IPC647E Rack PC, IPC847E Rack PC; Can also be used with: IPC477E Panel PC, IPC PX-39A Panel PC, IPC427E Box PC, IPC BX-39A Box PC; **Requirement:** Windows 10 (64-bit) with UEFI boot; for supported Windows 10 versions, see Technical specifications. For optimum fail-safe operation, IPC configurations with NVRAM are recommended (requirement for use of version V21.9). **Type of delivery:** en, de, fr, es, it, zh	
• Version V30.1 for Windows; Single license for one installation Software on DVD, license key on USB flash drive	**6ES7672-8FC02-0YA0**
• Version V30.1 for Windows; Single license for one installation; Software download including license key [1]	**6ES7672-8FC02-0YG0**
• Version V30.1 for Windows; Upgrade license for one installation For upgrading existing installations with CPU 1508S F Version 2 Software download including license key [1]	**6ES7672-8FC02-0YK0**
• Version V29.1 for Windows; Single license for one installation Software and documentation on DVD, license key on USB flash drive Note: for safety functions, IPC with NVRAM are absolutely necessary	**6ES7672-8FC01-0YA0**
• Version V29.1 for Windows; Single license for one installation; Software download including license key [1] Note: for safety functions, IPC with NVRAM are absolutely necessary	**6ES7672-8FC01-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC627E Box PC	**6AG4131-3....-....**
• SIMATIC IPC677E Panel PC	**6AV7261-.....-....**
• SIMATIC IPC647E Rack PC	**6AG4112-3....-....**
• SIMATIC IPC847E Rack PC	**6AG4114-3....-....**
• SIMATIC IPC427E Microbox PC	**6AG4141-.....-....**
• SIMATIC IPC477E Panel PC	**6AV7241-.....-....**
• SIMATIC IPC BX-39A Microbox PC	**6AG4142-.....-....**
• SIMATIC IPC PX-39A Panel PC	**6AV7242-.....-....**
For more information, see Catalog ST 80 / ST PC	
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS (can only be used with version V21.9)	**6GK1562-2AA00**

Selection and ordering data (continued)

CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP device, incl. PG and FDL protocols; single license for 1 installation, Runtime software, software and electronic manual on CD-ROM, Conformance Class A; for operating system support see SIMATIC NET software; en/de (can only be used with version V21.9)	**6GK1562-3AA00**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-8FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F	6ES7672-8FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F
General information		
Product type designation	CPU 1508S F	CPU 1508S F
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V17	V20
Storage		
Work memory		
• integrated (for program)	12.5 Mbyte	12.5 Mbyte
• integrated (for data)	100 Mbyte	100 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte	50 Mbyte
Load memory		
• integrated (on PC mass storage)	1 024 Mbyte	1 024 Mbyte
CPU processing times		
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On IPC427E, Intel Xeon processor
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte	32 kbyte
• Outputs	32 kbyte	32 kbyte
Time of day		
Clock		
• Type	Software clock, synchronizable, no battery backup	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	6ES7672-8FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F	6ES7672-8FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F
1. Interface		
Interface type	CP 1625	CP 1625
Number of connections	192	192
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol		Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy		Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256; the maximal amount of supported devices on all interfaces (PN/PB) is 384 in total	256; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.	16 kbyte	16 kbyte
- Outputs, max.	16 kbyte	16 kbyte
PROFINET IO Device		
- Services		

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Technical specifications (continued)

Article number	6ES7672-8FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F	6ES7672-8FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Number of connections	192	192
Interface types		
• RJ 45 (Ethernet)	Yes	Yes
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• IP protocol		Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• PROFIBUS DP master		No
• PROFIBUS DP device		No
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		

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Technical specifications (continued)

Article number	6ES7672-8FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F	6ES7672-8FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128; the maximal amount of supported devices on all interfaces (PN/PB) is 384 in total	128; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported		Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
- Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	No	No
- Dynamic Frame Packing (DFP)		No
- PROFIenergy	Yes	Yes
- Prioritized startup		Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes	Yes
- PROFINET Security Class		SNMP Configuration and DCP Read Only
3. Interface		
Interface type	PROFIBUS with CP 5622, CP 5622 onboard	
Number of connections	44	
Protocols		
• PROFIBUS DP master	Yes	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes	
PROFIBUS DP master		
• max. number of DP devices	64	

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Technical specifications (continued)

Article number	6ES7672-8FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F	6ES7672-8FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F
4. Interface		
Interface type	PROFIBUS with CP 5623	
Number of connections	44	
Interface types		
• RS 485	Yes	
Protocols		
• PROFIBUS DP master	Yes	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes; no PG/STEP 7 connection possible	
PROFIBUS DP master		
• max. number of DP devices	125	
Protocols		
Number of connections		
• Number of connections, max.	192	192
Redundancy mode		
- Media redundancy		
- MRP	Yes	Yes
- MRP interconnection, supported		Yes
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800	4 800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes

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Technical specifications (continued)

Article number	6ES7672-8FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F	6ES7672-8FC02-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F
Hardware requirement		
Hardware required	SIMATIC IPC4x7E, IPC627D, IPC677D, IPC827D, configurations with NVRAM required; IPC6x7E, IPC847E	SIMATIC IPC427E, IPC477E (Pro), IPC BX-39A, IPC PX-39A (Pro), IPC627E, IPC677E, IPC647E, IPC847E
Processor		
• Single-core processor	No	No
• Single-core processor with hyper-threading	No	No
• Multi-core processor	Yes	Yes
• Multi-core processor with hyper-threading	Yes	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Storage		
• Work memory, min.	8 Gbyte	8 Gbyte
• Hard disk memory required for installation	720 Mbyte	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte	230 Mbyte
• Hard disk memory required at runtime	1 000 Mbyte	1 661 Mbyte
Operating systems		
Runs under operating system		
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit); Windows Embedded Standard 7 with delivery image of the SIMATIC IPC	No
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D, IPC8x7D; Windows 10 Enterprise 2019 LTSC 64-bit, MUI on IPC2x7E, IPC4x7E, IPC6x7E, IPC8x7E	Yes; Windows 10 Enterprise 2019 LTSC and 2021 LTSC, 64-bit, MUI
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration		Yes
• Number of users		100
Open Development interfaces		
• Size of ODK SO file, max.	9.8 Mbyte	9.8 Mbyte

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Overview



- SIMATIC S7-1500 Software Controller V30.1 with Linux (Industrial OS 3.2.4 or higher) as operating system for implementing the functions of a SIMATIC S7-1500 Controller on SIMATIC IPC
- For use with control applications with increased requirements for program and data memory
- For use as a PC-based controller in machines with distributed I/O via PROFINET
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET connections
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- Supports PROFIsafe in distributed configurations
- Optimized for PC-based control tasks with the IPC627E Box PC, the IPC677E Panel PC, and the IPC647E and IPC847E Rack PCs
- Execution of functions and algorithms implemented with high-level languages (C++/Python) on Linux (Industrial OS 3.2.4 or higher) using the Realtime Information Backbone (RIB)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes (motion control functionalities require PROFINET IRT capability via CP 1625 and a PCIe slot on the IPC)
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA Server (Data Access) and Client as Runtime option for the easy connection of the SIMATIC S7-1500 Software Controller to Windows applications or third-party devices/systems

Overview (continued)

New in version V30.1: General Sales Release Linux (Industrial OS 3.2.4 or higher)

- Support for the current IPC generation SIMATIC IPC427E, IPC477E as well as SIMATIC IPC BX-39A and PX-39A
- Support of UEFI boot and M.2 SSD on all IPC platforms
- Improved commissioning:
  The resource allocation for the SIMATIC S7-1500 Software Controller, e.g. the interfaces used for PROFINET, is now set using a separate tool and no longer with the two-stage download from STEP 7. This permits a flexible choice of IPC without modifying the STEP 7 project
- Communication between Linux applications and the SIMATIC S7-1500 Software Controller is achieved via pure TCP/IP links. Communication with the SIMATIC S7-1500 Software Controller is possible directly through the PC interfaces on the Linux side ("bridging")
- Safety functions possible on IPC without NVRAM
- No direct support from PROFIBUS, PROFIBUS support is only possible with an additional plug-in card
- In order to use the SIMATIC S7-1500 Software Controller V30.1 instead of a previous version (e.g. V21.9), changes in the configuration and installation are required.

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Selection and ordering data

SIMATIC S7-1500 Software Controller CPU 1508S F For implementing the function of a fail-safe S7-1500 Controller on a SIMATIC IPC with Linux as operating system (Industrial OS 3.2.4 or higher) **Target system:** Optimized for PC-based control tasks with: IPC677E Panel PC, IPC627E Box PC, IPC647E Rack PC, IPC847E Rack PC; Can also be used with: IPC477E Panel PC, IPC PX-39A Panel PC, IPC427E Box PC, IPC BX-39A Box PC; **Requirement:** Linux (Industrial OS 3.2.4 or higher) with UEFI boot; For supported Linux versions, see Technical specifications; For optimal fail-safe operation, IPC configurations with NVRAM are recommended **Type of delivery:** en, de, fr, es, it, zh	
• Version V30.1 for Windows; Single license for one installation; Software download including license key [1]	**6ES7672-8FD02-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC627E Box PC	**6AG4131-3....-....**
• SIMATIC IPC677E Panel PC	**6AV7261-.....-....**
• SIMATIC IPC647E Rack PC	**6AG4112-3....-....**
• SIMATIC IPC847E Rack PC	**6AG4114-3....-....**
• SIMATIC IPC427E Microbox PC	**6AG4141-.....-....**
• SIMATIC IPC477E Panel PC	**6AV7241-.....-....**
• SIMATIC IPC BX-39A Microbox PC	**6AG4142-.....-....**
• SIMATIC IPC PX-39A Panel PC	**6AV7242-.....-....**
For more information, see Catalog ST 80 / ST PC	
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the SIMATIC S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS (can only be used with version V21.9)	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP device, incl. PG and FDL protocols; single license for 1 installation, Runtime software, software and electronic manual on CD-ROM, Conformance Class A; for operating system support see SIMATIC NET software; en/de (can only be used with version V21.9)	**6GK1562-3AA00**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-8FD02-0YG0 SIMATIC Failsafe SW Ctrl CPU 1508S F DL
General information	
Product type designation	CPU 1508S F
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20
Storage	
Work memory	
• integrated (for program)	12.5 Mbyte
• integrated (for data)	100 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
Load memory	
• integrated (on PC mass storage)	1 024 Mbyte
CPU processing times	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 timer	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Software clock, synchronizable, no battery backup
1. Interface	
Interface type	CP 1625
Number of connections	192
Interface types	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	
- Services	
- Isochronous mode	Yes

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Technical specifications (continued)

Article number	6ES7672-8FD02-0YG0 SIMATIC Failsafe SW Ctrl CPU 1508S F DL
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625
- Number of connectable IO Devices, max.	256; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
PROFINET IO Device	
- Services	
- PG/OP communication	Yes
- Isochronous mode	No
- IRT	Yes
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-8FD02-0YG0 SIMATIC Failsafe SW Ctrl CPU 1508S F DL
2. Interface	
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Number of connections	192
Interface types	
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• PROFIBUS DP master	No
• PROFIBUS DP device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
PROFIBUS DP master	
• max. number of DP devices	Profibus interface is not available.
PROFINET IO Controller	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
- Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
- Services	
- Isochronous mode	No
- IRT	No
- Dynamic Frame Packing (DFP)	No
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
- PROFINET Security Class	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-8FD02-0YG0 SIMATIC Failsafe SW Ctrl CPU 1508S F DL
Protocols	
Number of connections	
• Number of connections, max.	192
Redundancy mode	
- Media redundancy	
- MRP	Yes
- MRP interconnection, supported	Yes
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	4 800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Hardware requirement	
Hardware required	SIMATIC IPC427E, IPC477E (Pro), IPC BX-39A, IPC PX-39A (Pro)
Processor	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Storage	
• Work memory, min.	8 Gbyte
• Hard disk memory required for installation	3 Gbyte
• Temporary hard disk memory for installation	300 Mbyte
• Hard disk memory required at runtime	1 700 Mbyte

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Technical specifications (continued)

Article number	6ES7672-8FD02-0YG0 SIMATIC Failsafe SW Ctrl CPU 1508S F DL
Configuration	
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte

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Overview



For the Software Controller CPU 1508S T, generally the same product information as for the CPU 1508S apply. Differences are specified in the product overview or the operating instructions. Special features of the CPU 1508S T compared to the standard CPU result from the optimization for Motion Control applications in the high-end range.

The main differences are:

- Adjustments to the quantity structure, e.g. data storage, Motion Control resources, IRT participants (see Technical specifications)
- Focus on real-time applications and performance of PLC applications as opposed to the performance of Windows applications.
- Parallel and independent operation of the Windows operating system and the PLC application is possible. However, a forced restart of the Windows system (e.g. after Windows update) will also cause the PLC (Windows SMIs) to restart
- Supported IPC hardware (depending on the firmware version of the Software Controller):
  - Box IPC 627E with Intel Core i7 (for V30.1)
  - Panel IPC 677E with Intel Core i7 (for V30.1)
  - Box IPC BX-59A with Intel Core i7 (V40.1 or higher)

Selection and ordering data

CPU 1508S T Software Controller For the implementation of a technology controller on SIMATIC IPC **Target system:** Optimized for PC-based control tasks with Box PC SIMATIC IPC627E and Panel PC SIMATIC IPC677E **Requirements:** Windows 10 (64-bit) with UEFI boot; for supported Windows 10 version, see Technical specifications **Type of delivery:** en, de, fr, it, es, zh	
SIMATIC S7-1500, software **CPU 1508S T Software Controller** Single license for 1 installation, Runtime software Class A; Runtime software, software and documentation on DVD, license key on USB flash drive; 6 languages (en, de, fr, it, es, zh), executable on Windows 10 Reference hardware: IPC627E (i7)	**6ES7672-8TC02-0YA0**
SIMATIC S7-1500, software **CPU 1508S T V30.1 Software Controller** Single license for 1 installation, Runtime software Class A; Runtime software, software, documentation and license key download[1]; 6 languages (en, de, fr, it, es, zh); executable on Windows 10; Reference hardware: IPC627E (i7) Consignee email address required for delivery	**6ES7672-8TC02-0YG0**
SIMATIC S7-1500, software **CPU 1508S T V40.1 Software Controller** Single license for 1 installation, Runtime software Class A; Runtime software, software, documentation and license key download[1]; 6 languages (en, de, fr, it, es, zh); executable on Windows 11; Reference hardware: BX-59A (i7) Consignee email address required for delivery	**6ES7672-8TC04-0YG0**
Accessories	
SIMATIC IPC627E (Box PC) UHD graphics onboard; DP/DVI-D; 3x Gigabit Ethernet (IE/PN); 6x USB 3.1 Gen. 2; 1x serial (COM 1); RAID controller on board; watchdog, temperature and fan monitoring	**6AG4131-3....-....**
SIMATIC IPC677E (Panel PC) UHD graphics onboard; DP/DVI-D; 3x Gigabit Ethernet (IE/PN); 6x USB 3.1 Gen. 2; 1x serial (COM 1); RAID controller on board; watchdog, temperature and fan monitoring	**6AV7261-.....-....**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-8TC02-0YA0 SIMATIC Software Controller CPU 1508S T	6ES7672-8TC04-0YG0 SIMATIC SW-Controller CPU 1508S T DL
General information		
Product type designation	CPU 1508S T	CPU 1508S T
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V20	V21 Update 1
Storage		
Work memory		
• integrated (for program)	12.5 Mbyte	20 Mbyte
• integrated (for data)	32 Mbyte	200 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.	50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Load memory		
• integrated (on PC mass storage)	1 024 Mbyte	1 024 Mbyte
CPU processing times		
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor	0.3 ns; On BX-59A, Core i7-13700E, 3.6 GHz
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor	0.8 ns; On BX-59A, Core i7-13700E, 3.6 GHz
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	0.8 ns; On BX-59A, Core i7-13700E, 3.6 GHz
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On BX-59A, Core i7-13700E, 3.6 GHz
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Software clock, synchronizable, no battery backup	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	6ES7672-8TC02-0YA0 SIMATIC Software Controller CPU 1508S T	6ES7672-8TC04-0YG0 SIMATIC SW-Controller CPU 1508S T DL
1. Interface		
Interface type	CP 1625	SIMATIC CP1625-2 PCIe card
Number of connections	192	
Interface types		
• RJ 45 (Ethernet)	Yes	Yes; X301 X1
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse		500 µs
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	
- PROFIenergy	Yes	Yes; per user program
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384	512; in total, up to 1 152 distributed I/O devices can be connected
- Of which IO devices with IRT, max.	256; over CP1625 with DFP	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	256	512
- of which in line, max.	256	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)	
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
- Address area		
- Inputs, max.	16 kbyte	16 kbyte
- Outputs, max.	16 kbyte	16 kbyte
PROFINET IO Device		
- Services		

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Technical specifications (continued)

Article number	6ES7672-8TC02-0YA0 SIMATIC Software Controller CPU 1508S T	6ES7672-8TC04-0YG0 SIMATIC SW-Controller CPU 1508S T DL
- Isochronous mode	No	Yes
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	
- PROFIenergy	Yes	Yes; per user program
- Prioritized startup	Yes	
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record	Yes	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
2. Interface		
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T	SIMATIC CP1625-2 PCIe card
Number of connections	192	
Interface types		
• RJ 45 (Ethernet)	Yes	Yes; X301 X2
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	1	2
• integrated switch	No	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO device	Yes	Yes
• PROFIBUS DP master	No	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	Yes
PROFINET IO Controller		

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Technical specifications (continued)

Article number	6ES7672-8TC02-0YA0 SIMATIC Software Controller CPU 1508S T	6ES7672-8TC04-0YG0 SIMATIC SW-Controller CPU 1508S T DL
- Services		
- Isochronous mode	No	Yes
- Direct data exchange		Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	No	Yes
- Dynamic Frame Packing (DFP)	No	
- PROFIenergy	Yes	Yes; per user program
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)	No
- Number of connectable IO Devices, max.		512; in total, up to 1 152 distributed I/O devices can be connected
- Of which IO devices with IRT, max.		64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	128; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384	512
- of which in line, max.	128	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes	
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
- Address area		
- Inputs, max.	8 kbyte	16 kbyte
- Outputs, max.	8 kbyte	16 kbyte
PROFINET IO Device		
- Services		
- Isochronous mode	No	Yes
- IRT	No	Yes
- Dynamic Frame Packing (DFP)	No	
- PROFIenergy	Yes	Yes; per user program
- Prioritized startup	Yes	
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record	Yes	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-8TC02-0YA0 SIMATIC Software Controller CPU 1508S T	6ES7672-8TC04-0YG0 SIMATIC SW-Controller CPU 1508S T DL
3. Interface		
Interface type		Onboard PROFINET / IE interface X2,X3 or X4 (refer to manual)
Interface types		
• RJ 45 (Ethernet)		Yes
- Transmission rate, max.		100 Mbit/s
- Industrial Ethernet status LED		Yes
• Number of ports		1
• integrated switch		No
Protocols		
• IP protocol		Yes; IPv4
• PROFINET IO Controller		Yes
• PROFINET IO device		Yes
• SIMATIC communication		Yes
• Open IE communication		Yes; Optionally also encrypted
• Web server		Yes
PROFINET IO Controller		
- Services		
- Isochronous mode		No
- IRT		No
- PROFIenergy		Yes
- Prioritized startup		Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.		128; in total, up to 1 152 distributed I/O devices can be connected
- of which in line, max.		128
- Number of IO Devices that can be simultaneously activated/deactivated, max.		8
- Number of IO Devices per tool, max.		8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device		
- Services		
- Isochronous mode		No
- IRT		No
- PROFIenergy		Yes
- Shared device		Yes
- Number of IO Controllers with shared device, max.		4

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Technical specifications (continued)

Article number	6ES7672-8TC02-0YA0 SIMATIC Software Controller CPU 1508S T	6ES7672-8TC04-0YG0 SIMATIC SW-Controller CPU 1508S T DL
Protocols		
Number of connections		
• Number of connections, max.	192	192
Redundancy mode		
- Media redundancy		
- Media redundancy		via interfaces of SIMATIC CP1625-2
- MRP	Yes	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes; not via Windows interfaces
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions		Yes
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	26 800	50 000
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
• Number of available Extended Motion Control resources for technology objects	768	2 000
• Required Extended Motion Control resources		
- per cam (1 000 points and 50 segments)	2	2
- per cam (10 000 points and 50 segments)	20	20
- per cam (50 points and 600 segments)		2
- per cam (50 points and 6 000 segments)		20
- for each set of kinematics	30	30
- per Interpreter		60
- Per leading axis proxy	3	3

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Technical specifications (continued)

Article number	6ES7672-8TC02-0YA0 SIMATIC Software Controller CPU 1508S T	6ES7672-8TC04-0YG0 SIMATIC SW-Controller CPU 1508S T DL
• kinematics functions		
- kinematics with up to 4 interpolating axes	Yes	Yes
- kinematics with 5 or more interpolating axes	No	No
- user-defined kinematics		Yes
• Positioning axis		
- Number of positioning axes, max.	310	
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Security		
signed firmware update		Yes
safely removing data		Yes
Hardware requirement		
Hardware required	SIMATIC IPC627E, IPC677E (with Intel i7-8700)	BX-59A
Processor		
• Single-core processor	No	No
• Single-core processor with hyper-threading	No	No
• Multi-core processor	Yes	Yes
• Multi-core processor with hyper-threading	Yes	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S	2
Storage		
• Work memory, min.	8 Gbyte	32 Gbyte
• Hard disk memory required for installation	720 Mbyte	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte	230 Mbyte
• Hard disk memory required at runtime	1 661 Mbyte	3 260 Mbyte
Operating systems		
Runs under operating system		
• Windows 10	Yes; Windows 10 Enterprise 2019 LTSC and 2021 LTSC	
• Windows 11		Yes; Windows 11 IoT Enterprise 2024 LTSC
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe		No
• Protection level: Complete protection	Yes	Yes
• User administration	Yes	Yes; device-wide and centralized
• Number of users	100	100
Open Development interfaces		
• Size of ODK SO file, max.	9.8 Mbyte	9.8 Mbyte

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Overview



For the Software Controller CPU 1508S TF, generally the same product information as for the CPU 1508S F apply. Differences are specified in the product overview or the operating instructions. Special features of the CPU 1508S TF compared to the failsafe CPU result from the optimization for Motion Control applications in the high-end range.

The main differences are:

- Adjustments to the quantity structure, e.g. data storage, Motion Control resources, IRT participants (see Technical specifications)
- Focus on real-time applications and performance of PLC applications as opposed to the performance of Windows applications
- Parallel and independent operation of the Windows operating system and the PLC application is possible. However, a forced restart of the Windows system (e.g. after Windows update) will also cause the PLC (Windows SMIs) to restart
- Supported IPC hardware (depending on the firmware version of the Software Controller):
  - Box IPC 627E with Intel Core i7 (for V30.1)
  - Panel IPC 677E with Intel Core i7 (for V30.1)
  - Box IPC BX-59A with Intel Core i7 (V40.1 or higher)

Selection and ordering data

CPU 1508S TF Software Controller For the implementation of a fail-safe technology controller on SIMATIC IPC **Target system:** Optimized for PC-based control tasks with Box PC SIMATIC IPC627E and Panel PC SIMATIC IPC677E **Requirements:** Windows 10 (64-bit) with UEFI boot; for supported Windows 10 version, see Technical specifications **Type of delivery:** en, de, fr, it, es, zh	
SIMATIC S7-1500, software CPU 1508S TF V30.1 Software Controller Single license for 1 installation, Runtime software Class A; Runtime software, software and documentation on DVD, license key on USB flash drive; 6 languages (en, de, fr, it, es, zh), executable on Windows 10 Reference hardware: IPC627E (i7)	**6ES7672-8UC02-0YA0**
SIMATIC S7-1500, software CPU 1508S TF V30.1 Software Controller Single license for 1 installation, Runtime software Class A; Runtime software, software, documentation and license key download[1]; 6 languages (en, de, fr, it, es, zh); executable on Windows 10; Reference hardware: IPC627E (i7); Consignee email address required for delivery	**6ES7672-8UC02-0YG0**
SIMATIC S7-1500, software CPU 1508S TF V40.1 Software Controller Single license for 1 installation, Runtime software Class A; Runtime software, software, documentation and license key download[1]; 6 languages (en, de, fr, it, es, zh); executable on Windows 11; Reference hardware: BX-59A (i7) Consignee email address required for delivery	**6ES7672-8UC04-0YG0**
Accessories	
SIMATIC IPC627E (Box PC) UHD graphics onboard; DP/DVI-D; 3x Gigabit Ethernet (IE/PN); 6x USB 3.1 Gen. 2; 1x serial (COM 1); RAID controller on board; watchdog, temperature and fan monitoring	**6AG4131-3....-....**
SIMATIC IPC677E (Panel PC) UHD graphics onboard; DP/DVI-D; 3x Gigabit Ethernet (IE/PN); 6x USB 3.1 Gen. 2; 1x serial (COM 1); RAID controller on board; watchdog, temperature and fan monitoring	**6AV7261-.....-....**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7672-8UC02-0YA0 SIMATIC Software Controller CPU 1508S TF	6ES7672-8UC04-0YG0 SIMATIC SW-Controller CPU 1508S TF DL
General information		
Product type designation	CPU 1508S TF	CPU 1508S TF
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V20	V21 Update 1
Storage		
Work memory		
• integrated (for program)	12.5 Mbyte	20 Mbyte
• integrated (for data)	32 Mbyte	200 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.	50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Load memory		
• integrated (on PC mass storage)	1 024 Mbyte	1 024 Mbyte
CPU processing times		
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor	0.3 ns; On BX-59A, Core i7-13700E, 3.6 GHz
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor	0.8 ns; On BX-59A, Core i7-13700E, 3.6 GHz
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	0.8 ns; On BX-59A, Core i7-13700E, 3.6 GHz
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor	2 ns; On BX-59A, Core i7-13700E, 3.6 GHz
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Software clock, synchronizable, no battery backup	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	6ES7672-8UC02-0YA0 SIMATIC Software Controller CPU 1508S TF	6ES7672-8UC04-0YG0 SIMATIC SW-Controller CPU 1508S TF DL
1. Interface		
Interface type	CP 1625	SIMATIC CP1625-2 PCIe card
Number of connections	192	
Interface types		
• RJ 45 (Ethernet)	Yes	Yes; X301 X1
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse		500 µs
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	
- PROFIenergy	Yes	Yes; per user program
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be seperated by means of a switch (e.g SCALANCE X205) or CP1625	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384	512; in total, up to 1 152 distributed I/O devices can be connected
- Of which IO devices with IRT, max.	256; over CP1625 with DFP	64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	256	512
- of which in line, max.	256	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes; the CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)	
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
- Address area		
- Inputs, max.	16 kbyte	16 kbyte
- Outputs, max.	16 kbyte	16 kbyte
PROFINET IO Device		
- Services		

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Technical specifications (continued)

Article number	6ES7672-8UC02-0YA0 SIMATIC Software Controller CPU 1508S TF	6ES7672-8UC04-0YG0 SIMATIC SW-Controller CPU 1508S TF DL
- Isochronous mode	No	Yes
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	
- PROFIenergy	Yes	Yes; per user program
- Prioritized startup	Yes	
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record	Yes	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
2. Interface		
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T	SIMATIC CP1625-2 PCIe card
Number of connections	192	
Interface types		
• RJ 45 (Ethernet)	Yes	Yes; X301 X2
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	1	2
• integrated switch	No	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• PROFIBUS DP master	No	
• PROFIBUS DP device	No	
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	Yes
PROFINET IO Controller		

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Technical specifications (continued)

Article number	6ES7672-8UC02-0YA0 SIMATIC Software Controller CPU 1508S TF	6ES7672-8UC04-0YG0 SIMATIC SW-Controller CPU 1508S TF DL
- Services		
- Isochronous mode	No	Yes
- Direct data exchange		Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	No	Yes
- Dynamic Frame Packing (DFP)	No	
- PROFIenergy	Yes	Yes; per user program
- Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)	No
- Number of connectable IO Devices, max.		512; in total, up to 1 152 distributed I/O devices can be connected
- Of which IO devices with IRT, max.		64; with DFP: 256 IO devices in 8 DFP groups
- Number of connectable IO Devices for RT, max.	128; the maximal amount of supported devices on all interfaces (PN/PB) is 384 (256+128) in total; theoretically it should be 509 (256+128+125), but it is accepted to be limited to 384	512
- of which in line, max.	128	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes	
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
- Address area		
- Inputs, max.	8 kbyte	16 kbyte
- Outputs, max.	8 kbyte	16 kbyte
PROFINET IO Device		
- Services		
- Isochronous mode	No	Yes
- IRT	No	Yes
- Dynamic Frame Packing (DFP)	No	
- PROFIenergy	Yes	Yes; per user program
- Prioritized startup	Yes	
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record	Yes	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7672-8UC02-0YA0 SIMATIC Software Controller CPU 1508S TF	6ES7672-8UC04-0YG0 SIMATIC SW-Controller CPU 1508S TF DL
3. Interface		
Interface type		Onboard PROFINET / IE interface X2,X3 or X4 (refer to manual)
Interface types		
• RJ 45 (Ethernet)		Yes
- Transmission rate, max.		100 Mbit/s
- Industrial Ethernet status LED		Yes
• Number of ports		1
• integrated switch		No
Protocols		
• IP protocol		Yes; IPv4
• PROFINET IO Controller		Yes
• PROFINET IO device		Yes
• SIMATIC communication		Yes
• Open IE communication		Yes; Optionally also encrypted
• Web server		Yes
PROFINET IO Controller		
- Services		
- Isochronous mode		No
- IRT		No
- PROFIenergy		Yes
- Prioritized startup		Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.		128; in total, up to 1 152 distributed I/O devices can be connected
- of which in line, max.		128
- Number of IO Devices that can be simultaneously activated/deactivated, max.		8
- Number of IO Devices per tool, max.		8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
PROFINET IO Device		
- Services		
- Isochronous mode		No
- IRT		No
- PROFIenergy		Yes
- Shared device		Yes
- Number of IO Controllers with shared device, max.		4

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Technical specifications (continued)

Article number	6ES7672-8UC02-0YA0 SIMATIC Software Controller CPU 1508S TF	6ES7672-8UC04-0YG0 SIMATIC SW-Controller CPU 1508S TF DL
Protocols		
Number of connections		
• Number of connections, max.	192	192
Redundancy mode		
- Media redundancy		
- Media redundancy		via interfaces of SIMATIC CP1625-2
- MRP	Yes	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes; not via Windows interfaces
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions		Yes
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	26 800	50 000
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
• Number of available Extended Motion Control resources for technology objects	768	2 000
• Required Extended Motion Control resources		
- per cam (1 000 points and 50 segments)	2	2
- per cam (10 000 points and 50 segments)	20	20
- per cam (50 points and 600 segments)		2
- per cam (50 points and 6 000 segments)		20
- for each set of kinematics	30	30
- per Interpreter		60
- Per leading axis proxy	3	3

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Technical specifications (continued)

Article number	6ES7672-8UC02-0YA0 SIMATIC Software Controller CPU 1508S TF	6ES7672-8UC04-0YG0 SIMATIC SW-Controller CPU 1508S TF DL
• kinematics functions		
- kinematics with up to 4 interpolating axes	Yes	Yes
- kinematics with 5 or more interpolating axes	No	No
- user-defined kinematics		Yes
- SIMATIC Safe Kinematics		Yes
• Positioning axis		
- Number of positioning axes, max.	310	
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Security		
signed firmware update		Yes
safely removing data		Yes
Hardware requirement		
Hardware required	SIMATIC IPC627E, IPC677E (with Intel i7-8700 and NVRAM)	BX-59A
Processor		
• Single-core processor	No	No
• Single-core processor with hyper-threading	No	No
• Multi-core processor	Yes	Yes
• Multi-core processor with hyper-threading	Yes	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S	2
Storage		
• Work memory, min.	8 Gbyte	32 Gbyte
• Hard disk memory required for installation	720 Mbyte	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte	230 Mbyte
• Hard disk memory required at runtime	1 661 Mbyte	3 260 Mbyte
Operating systems		
Runs under operating system		
• Windows 10	Yes; Windows 10 Enterprise 2019 LTSC and 2021 LTSC	
• Windows 11		Yes; Windows 11 IoT Enterprise 2024 LTSC
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes	Yes; device-wide and centralized
• Number of users	100	100
Open Development interfaces		
• Size of ODK SO file, max.	9.8 Mbyte	9.8 Mbyte

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Overview

Note

This catalog entry contains non-binding information on a supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

The ODK 1500S SQL driver enables direct access to an SQL database from the PLC program. In this case the database can be installed on the same computer as the S7-1500 Software Controller or in the network.

- Direct data exchange with SQL-based database by means of SQL commands from the PLC program
- Connection to SQL-based database on the same PC or to database servers in the network

Technical specifications

Supported SQL commands	• SELECT • INSERT • UPDATE • DELETE
Supported data types	All standard SQL data types
System requirements	
• Runtime PC	SIMATIC IPC with S7-1500 Software Controller or SIMATIC ET 200SP Open Controller
• Engineering	STEP 7 in the TIA Portal V13 SP1

More information

If you are interested, please contact your sales representative under this link.

You can find Service and Support under this link.

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Overview

Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

With the function blocks of the ODK 1500S XML Data Access driver it is possible to access specific information in XML files in the Windows file system from the PLC program.

XPath expressions are used for accessing XML file elements since they provide the highest possible flexibility for processing XML data. This means that extremely large XML files can be edited, too.

The driver offers the following functionality:

- XML data can be read into and processed in the PLC.
- XML data can be modified and written back to the XML file.

Technical specifications

System requirements	
• Runtime PC	SIMATIC IPC with SIMATIC S7-1500 Software Controller or SIMATIC ET 200SP Open Controller
• Engineering	STEP 7 in TIA Portal V13 SP1

More information

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Overview

Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

The ODK 1500S FileServer enhances the SIMATIC S7-1500 Software Controller file function with an option enabling direct access to the Windows file system of the PC from the STEP 7 program.

The driver enables reading and writing of data blocks in/from files in structured form. Various file formats are supported.

There are also FBs available for handling files (e.g. renaming, deleting).

Technical specifications

Supported file formats	• CSV • ASCII • Windows-INI • XML[1)] • Binary
System requirements	
• Runtime PC	SIMATIC IPC with SIMATIC S7-1500 Software Controller or SIMATIC ET 200SP Open Controller
• Engineering	STEP 7 in TIA Portal V13 SP1

1) The XML format is predefined. A DB can be saved and read in as an XML file. It is not possible to parse any particular XML file.

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Overview

Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

The ODK 1500S SMX driver permits access from a Windows user program to data of the PLC program. A shared memory which can be accessed by the PLC and user program is set up for this purpose. The ODK 1500S simplifies the changeover to the SIMATIC S7-1500 Software Controller of applications that previously used the SMX interface of the SIMATIC WinAC RTX.

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Overview

Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

The ODK 1500S serial driver enables serial communication from the STEP 7 user program via the integrated serial interface of a SIMATIC IPC or, depending on the application environment, via a USB-to-serial adapter. All serial interfaces of the PC are supported, which are addressed in Windows as COM*n* interface, e.g. RS232, RS422 or RS485.

More information

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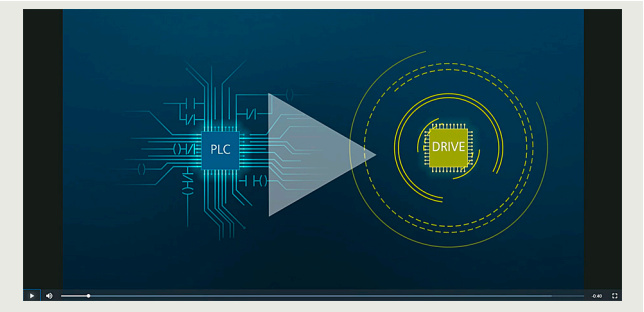
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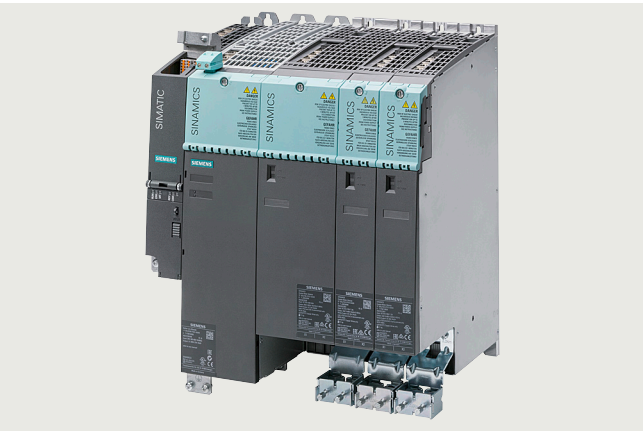
9/2	**Introduction**
9/2	Drive Controllers
9/3	**Technology CPUs**
9/3	Technical specifications
9/9	CPU 1504D TF
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Overview



SIMATIC Drive Controller Video



The SIMATIC Drive Controller is available in two performance classes and meets even the most demanding Motion Control needs with the two fail-safe technology CPUs (CPU 1504D TF and CPU 1507D TF).

The fail-safe CPUs permit the processing of standard and safety programs on the same controller.

As technology CPUs, they also have extensive Motion Control functions such as:

- Speed and positioning axes
- Synchronous operation functions
  - Synchronizing with/without specifying the synchronization position
  - Actual value coupling
  - Shifting of the master value at following axis
  - Camming
  - Cross-PLC synchronous operation
- Cam
- Up to 4 encoder or measuring systems as actual position for position control
- Cyclic specification of the motion vector from the application (MotionIn interface)

Overview (continued)

- Kinematics
  - With up to 4 interpolating axes (e.g. cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA)
  - User-defined kinematics with up to 4 interpolating axes
  - Up to 6 interpolating axes with the additional Motion Control package "S7-1500T Motion Control KinPlus"
- External encoders, output cams and measuring inputs

The extensive integrated interfaces and technology I/Os are consistently available in all performance classes and enable the efficient implementation of compact and modular automation solutions with Motion Control based on the SINAMICS S120 drive system.

Thanks to fast system response times, the SIMATIC Drive Controller is the ideal solution wherever axes with high configuration limits and the shortest cycle times for high machine cycle rates and optimum product quality through deterministic and reproducible machine behavior are required.

The SIMATIC Drive Controller is configured in TIA Portal V16 or higher with the SIMATIC STEP 7 Professional engineering software and SINAMICS Startdrive.
The SIMATIC Drive Controller can be extended with components from the modular SINAMICS S120 drive system and SIMATIC automation components such as HMI and I/O systems.
Additional drive systems such as e.g SINAMICS S210 or SINAMICS G can easily be integrated via PROFINET.

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Technical specifications

Article number	6ES7615-4DF10-0AB0 SIMATIC Drive Controller, CPU 1504D TF	6ES7615-7DF10-0AB0 SIMATIC Drive Controller, CPU 1507D TF
General information		
Product type designation	CPU 1504D TF	CPU 1507D TF
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V21 (FW V3.1) / V16 (FW V2.8) or higher	V21 (FW V3.1) / V16 (FW V2.8) or higher
Integrated drive control		
• Number of axes for servo control, max.	6	6
• Number of axes for vector control, max.	6	6
• Number of axes for V/f control, max.	12	12
• Remark	alternative control modes; drive control based on SINAMICS S120 CU320-2 (firmware version V5.x); functional subset compared to CU320-2: no free function blocks, ... ; for details, see the manual	alternative control modes; drive control based on SINAMICS S120 CU320-2 (firmware version V5.x); functional subset compared to CU320-2: no free function blocks, ... ; for details, see the manual
Supply voltage		
Rated value (DC)	24 V	24 V
Storage		
Work memory		
• integrated (for program)	4 Mbyte	15 Mbyte
• integrated (for data)	6 Mbyte	40 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), required	12 Mbyte; Recommended at least when integrated drive is used	12 Mbyte; Recommended at least when integrated drive is used
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 timer		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
Digital inputs		
integrated channels (DI)	28; max. depending on parameterization	28; max. depending on parameterization
Digital outputs		
integrated channels (DO)	16; max. depending on parameterization	16; max. depending on parameterization
Digital outputs, parameterizable	Yes; 8 DI/DQ (X122/X132, SINAMICS Integrated) + 8 DI/DQ (X142, PLC)	Yes; 8 DI/DQ (X122/X132, SINAMICS Integrated) + 8 DI/DQ (X142, PLC)
Short-circuit protection	Yes; electronic/thermal	Yes; electronic/thermal

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Technical specifications (continued)

Article number	6ES7615-4DF10-0AB0 SIMATIC Drive Controller, CPU 1504D TF	6ES7615-7DF10-0AB0 SIMATIC Drive Controller, CPU 1507D TF
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X150	Yes; X150
• Number of ports	3	3
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
- Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	Yes	Yes
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7615-4DF10-0AB0 SIMATIC Drive Controller, CPU 1504D TF	6ES7615-7DF10-0AB0 SIMATIC Drive Controller, CPU 1507D TF
2. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X160	Yes; X160
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No
PROFINET IO Controller		
- Services		
- Isochronous mode	No	No
- Direct data exchange	No	No
- IRT	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
PROFINET IO Device		
- Services		
- Isochronous mode	No	No
- IRT	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

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Technical specifications (continued)

Article number	6ES7615-4DF10-0AB0 SIMATIC Drive Controller, CPU 1504D TF	6ES7615-7DF10-0AB0 SIMATIC Drive Controller, CPU 1507D TF
3. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X130	Yes; X130
• Number of ports	1	1
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	No	No
• PROFINET IO Device	No	No
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
4. Interface		
Interface types		
• RS 485	Yes; X126	Yes; X126
• Number of ports	1	1
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	No	No
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols		
Number of connections		
• Number of connections, max.	384; Via integrated interfaces of the CPU	384; Via integrated interfaces of the CPU
Redundancy mode		
- Media redundancy		
- Media redundancy	only via interface X150	only via interface X150
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes	Yes

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Technical specifications (continued)

Article number	6ES7615-4DF10-0AB0 SIMATIC Drive Controller, CPU 1504D TF	6ES7615-7DF10-0AB0 SIMATIC Drive Controller, CPU 1507D TF
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	3 200	12 800
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
• Number of available Extended Motion Control resources for technology objects	160	420
• Required Extended Motion Control resources		
- per cam (1 000 points and 50 segments)	2	2
- per cam (10 000 points and 50 segments)	20	20
- for each set of kinematics	30	30
- per Interpreter	60	60
- Per leading axis proxy	3	3
• kinematics functions		
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No	Yes; only with S7-1500T Motion Control KinPlus, as of TIA Portal V18 / FW V3.0 to V3.1
- user-defined kinematics	Yes	Yes
- SIMATIC Safe Kinematics	No	Yes; optional, as of Safe Kinematics V17 / FW V2.9 to V3.1
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Security		
PROFINET Security Class	1	1
signed firmware update	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	0 °C
• max.	55 °C	55 °C

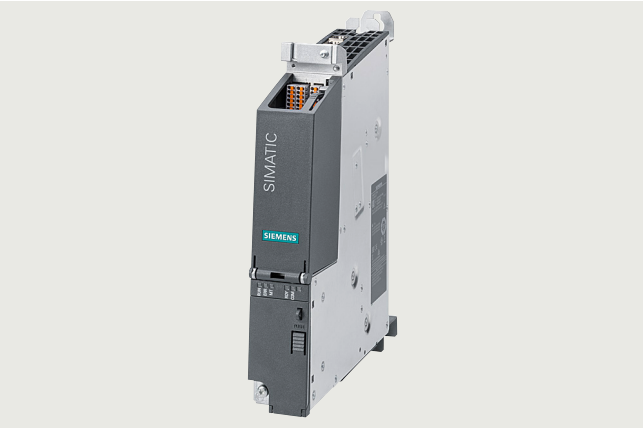
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Technical specifications (continued)

Article number	6ES7615-4DF10-0AB0 SIMATIC Drive Controller, CPU 1504D TF	6ES7615-7DF10-0AB0 SIMATIC Drive Controller, CPU 1507D TF
Configuration		
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes	Yes
Dimensions		
Width	50 mm	50 mm
Height	300 mm	300 mm
Depth	226 mm; 270 mm with spacer (included in scope of supply)	226 mm; 270 mm with spacer (included in scope of supply)
Weights		
Weight, approx.	2 400 g	2 400 g
Other		
Note:	The SIMATIC Drive Controller deviates from the usual SIMATIC S7-1500 ambient conditions and specifications as well as the available approvals and certificates because of the drive design. For details, see the SIMATIC Drive Controller device and system manual. Operation is without fan.	The SIMATIC Drive Controller deviates from the usual SIMATIC S7-1500 ambient conditions and specifications as well as the available approvals and certificates because of the drive design. For details, see the SIMATIC Drive Controller device and system manual. Operation is without fan.

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Overview



CPU 1504D TF

- For standard and fail-safe applications with medium requirements for program scope and processing speed
- Ultra-compact due to the integration of fail-safe SIMATIC S7-1500 technology CPU, SINAMICS S120 drive control and technology I/Os in a single device
- Extensive integrated communication interfaces and technology I/Os for the efficient implementation of automation solutions with Motion Control
- Tried-and-tested engineering in TIA Portal

Selection and ordering data

SIMATIC S7-1500 Drive Controller CPU 1504D TF With SINAMICS S120 Integrated; Fail-safe technology CPU; Work memory: 4 MB for program, 6 MB for data; Interfaces: 12 DI, 16 DI/DQ, 4 DRIVE-CLiQ, 3 PROFINET: 3+1+1 ports, 1 PROFIBUS; SIMATIC Memory Card required Supported FW version: SIMATIC S7-1500 FW ≤ V3.1 (technology version ≤ V8.0), SINAMICS FW V5.2/V5.2 SP3	**6ES7615-4DF10-0AB0**
Accessories	
SIMATIC Memory Card [1]	
• 4 MB	**6ES7954-8LC04-0AA0**
• 12 MB	**6ES7954-8LE04-0AA0**
• 24 MB	**6ES7954-8LF04-0AA0**
• 256 MB	**6ES7954-8LL04-0AA0**
• 2 GB	**6ES7954-8LP04-0AA0**
• 32 GB	**6ES7954-8LT04-0AA0**
Drive licenses for integrated drive control	
Safety Integrated Extended Functions Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form[3] ; Email address required for delivery	**6SL3074-0AA10-0AH0**
Safety Integrated Advanced Functions Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form[3] ; Email address required for delivery	**6SL3074-0AA20-0AH0**
Cogging torque compensation Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form[3] ; Email address required for delivery	**6SL3074-0AA15-0AH0**
Advanced Position Control (APC) Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form[3] ; Email address required for delivery	**6SL3074-0AA05-0AH0**
Advanced Synchronous Reluctance Control Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form[3] ; Email address required for delivery	**6SL3074-0AA06-0AH0**
Technology Extension VIBX (Vibration Extinction) Certificate of License (CoL) per SINAMICS Integrated	
• CoL in electronic form[3] ; Email address required for delivery	**6SL3077-0AA00-5AH0**
Technology Extension SERVCOUP (Servo Coupling) Certificate of License (CoL) per SINAMICS Integrated	
• CoL in electronic form[3] ; Email address required for delivery	**6SL3077-0AA00-8AH0**

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Selection and ordering data (continued)

DCB Extension Library	
Certificate of License (CoL) per SINAMICS Integrated	
• CoL in electronic form[3]; Email address required for delivery	**6SL3077-0AA00-0AH0**
For further SINAMICS licenses (controller parameter adaptation, dynamic grid support, line droop control, DC-DC converter, polygonal line, setpoint generator, rail control, reactive power compensation, brake condition monitoring, trace data, trace buffer, and additional filters), see the SIMATIC Drive Controller System Manual.	
Control licenses	
SIMATIC OPC UA S7-1500 Small Required for CPU 1504D TF Single Runtime License	
• License certificate for OPC UA Server (Data Access and OPC UA Client)	**6ES7823-0BA00-1BA0**
• Download incl. license certificate for OPC UA Server (Data Access and OPC UA Client) [3] Email address required for delivery	**6ES7823-0BE00-1BA0**
Accessories for PROFIBUS (interface X126)	
PROFIBUS RS485 bus connector	
With angular cable outlet (35°) with screw-type connection, max. transfer rate 12 Mbps	
• Without PG/PC interface	**6ES7972-0BA42-0XA0**
• With PG/PC interface	**6ES7972-0BB42-0XA0**
PROFIBUS FastConnect RS485 bus connector	
With angular cable outlet (35°) with insulation displacement technology, max. transfer rate 12 Mbps	
• Without PG/PC interface	**6ES7972-0BA61-0XA0**
• With PG/PC interface	**6ES7972-0BB61-0XA0**
FastConnect cables for PROFIBUS	
(sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m)	
• FC standard cable GP	**6XV1830-0EH10**
• FC robust cable	**6XV1830-0JH10**
• FC flexible cable	**6XV1831-2K**
• FC trailing cable, sheath color: Petrol	**6XV1830-3EH10**
• FC trailing cable, sheath color: Violet	**6XV1831-2L**
• FC food cable	**6XV1830-0GH10**
• FC ground cable	**6XV1830-3FH10**
• FC FRNC cable GP	**6XV1830-0LH10**
Accessories for PROFINET (interface X150 and X160; X130 only up to 100 Mbps)	
IE FC RJ45 plug 145	
145° cable outlet (10/100 Mbps)	
• 1 unit	**6GK1901-1BB30-0AA0**
• 10 units	**6GK1901-1BB30-0AB0**
• 50 units	**6GK1901-1BB30-0AE0**

Selection and ordering data (continued)

FastConnect cables for Industrial Ethernet/PROFINET	
(sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m)	
• IE FC standard cable GP 2×2	**6XV1840-2AH10**
• IE FC flexible cable GP 2x2	**6XV1870-2B**
• IE FC trailing cable GP 2×2	**6XV1870-2D**
• IE FC trailing cable 2×2	**6XV1840-3AH10**
• IE FC marine cable 2×2	**6XV1840-4AH10**
Accessories for PROFINET (interface X130, for up to 1000 Mbps)	
IE FC RJ45 plug 180	
180° cable outlet (10/100/1000 Mbps)	
• 1 unit	**6GK1901-1BB12-2AA0**
• 10 units	**6GK1901-1BB12-2AB0**
• 50 units	**6GK1901-1BB12-2AE0**
FastConnect cables for Industrial Ethernet/PROFINET	
(sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m)	
• IE FC standard cable GP 4×2	**6XV1878-2A**
• IE FC flexible cable GP 4×2	**6XV1878-2B**
Other accessories	
PROFIBUS FastConnect stripping tool	**6GK1905-6AA00**
Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Dust protection blanking plugs	**6SL3066-4CA00-0AA0**
For sealing unused DRIVE-CLiQ and PROFINET ports; blanking plug (50 units)	
Spare parts	
Bottom cover	**6ES7615-0AC10-0AA0**
Top cover	**6ES7615-0AC10-1AA0**
Spacer	**6SL3064-1BB00-0AA0**
Terminal Kit	**6SL3064-2CB00-0AA0**
• 3 x I/O plug for X122/X132/X142	
• 1 x 24 V plug for X124	
• 5 x DRIVE-CLiQ blanking cover	
Engineering software	
The following engineering software is required for the SIMATIC Drive Controller:	For engineering software ordering data for controllers, see Catalog section 11. For engineering software ordering data for drive systems, see SiePortal.
• STEP 7 Professional V20 for configuring the control functionality	
• STEP 7 Safety Advanced V20 for creating safety-related programs	
• S7-PLCSIM Advanced V7.0 for simulation and validation of the control functionality	
• SINAMICS Startdrive Basic V20[4] or SINAMICS Startdrive Advanced V19 for configuring the integrated drive control (SINAMICS Integrated)	
• SINAMICS DCC V20 (option package for SINAMICS Startdrive) for the graphical configuration of control, computing and logic blocks	
Documentation	

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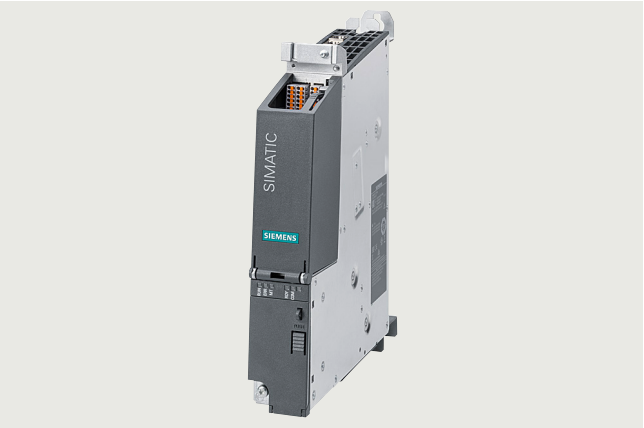
Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[3] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages, Software Update Service (SUS)[3] Within the scope of this contract, you will receive all software versions as download for one year. The contract is automatically extended for one more year unless it is canceled three months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) When using the integrated SINAMICS S120 drive control, a memory card size of at least 12 MB is recommended (at least 24 MB for extensive DCC use, e.g. with a DCB Extension Library). A memory card size of at least 256 MB is required for firmware updates.
2) The Ethernet interface X130 supports 10, 100 and 1000 Mbps. For 1000 Mbps, 8-wire cables (4x2) and the 180° FastConnect plug in 1000 Mbps version must be used.
3) Up-to-date information and download availability can be found at this link.
4) The SINAMICS Startdrive Basic commissioning tool is available for free on the internet under this link.

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Overview



CPU 1507D TF

- For standard and fail-safe applications with high to very high requirements for program scope and processing speed
- Ultra-compact due to the integration of fail-safe SIMATIC S7-1500 technology CPU, SINAMICS S120 drive control and technology I/Os in a single device
- Extensive integrated communication interfaces and technology I/Os for the efficient implementation of automation solutions with Motion Control
- Tried-and-tested engineering in TIA Portal

Selection and ordering data

SIMATIC S7-1500 Drive Controller CPU 1507D TF With SINAMICS S120 Integrated; Fail-safe technology CPU; Work memory: 15 MB for program, 40 MB for data; Interfaces: 12 DI, 16 DI/DQ, 4 DRIVE-CLiQ, 3 PROFINET: 3+1+1 ports, 1 PROFIBUS; SIMATIC Memory Card required Supported FW version: SIMATIC S7-1500 FW ≤ V3.1 (technology version ≤ V8.0), SINAMICS FW V5.2/V5.2 SP3	**6ES7615-7DF10-0AB0**
Accessories	
SIMATIC Memory Card [1]	
• 4 MB	**6ES7954-8LC04-0AA0**
• 12 MB	**6ES7954-8LE04-0AA0**
• 24 MB	**6ES7954-8LF04-0AA0**
• 256 MB	**6ES7954-8LL04-0AA0**
• 2 GB	**6ES7954-8LP04-0AA0**
• 32 GB	**6ES7954-8LT04-0AA0**
S7-1500T Motion Control KinPlus	
S7-1500T Motion Control KinPlus Runtime software For up to 6 interpolating axes, without documentation, Class A, executable under CPU 1518T/TF and SIMATIC Drive Controller CPU 1507D TF, suitable for firmware V3.1. A memory card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution.	
• Download product [3], available only in the EU Consignee email address required for delivery	**6ES7823-0KE01-1AA0**
• Supplied on USB flash drive	**6ES7823-0KU01-1AA0**
SIMATIC Memory Card for S7-1500T Motion Control KinPlus	
• 2 GB	**6ES7954-8LP80-0AA0**
• 32 GB	**6ES7954-8LT80-0AA0**
Drive licenses for integrated drive control	
Safety Integrated Extended Functions Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form [3] Email address required for delivery	**6SL3074-0AA10-0AH0**
Safety Integrated Advanced Functions Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form [3] Email address required for delivery	**6SL3074-0AA20-0AH0**
Cogging torque compensation Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form[3] Email address required for delivery	**6SL3074-0AA15-0AH0**
Advanced Position Control (APC) Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form[3] Email address required for delivery	**6SL3074-0AA05-0AH0**
Advanced Synchronous Reluctance Control Certificate of License (CoL) for a SINAMICS S120 axis	
• CoL in electronic form[3] Email address required for delivery	**6SL3074-0AA06-0AH0**

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Selection and ordering data (continued)

Technology Extension VIBX (Vibration Extinction)	
Certificate of License (CoL) per SINAMICS Integrated	
• CoL in electronic form[3] Email address required for delivery	**6SL3077-0AA00-5AH0**
Technology Extension SERVCOUP (Servo Coupling)	
Certificate of License (CoL) per SINAMICS Integrated	
• CoL in electronic form[3] Email address required for delivery	**6SL3077-0AA00-8AH0**
DCB Extension Library	
Certificate of License (CoL) per SINAMICS Integrated	
• CoL in electronic form[3] Email address required for delivery	**6SL3077-0AA00-0AH0**
For further SINAMICS licenses (controller parameter adaptation, dynamic grid support, line droop control, DC-DC converter, polygonal line, setpoint generator, rail control, reactive power compensation, brake condition monitoring, trace data, trace buffer, and additional filters), see the SIMATIC Drive Controller System Manual.	
Control licenses	
SIMATIC OPC UA S7-1500 Large Required for CPU 1507D TF Single Runtime License	
• License certificate for OPC UA Server (Data Access and OPC UA Client)	**6ES7823-0BA00-1DA0**
• Download incl. license certificate for OPC UA Server (Data Access and OPC UA Client) [3] Email address required for delivery	**6ES7823-0BE00-1DA0**
Accessories for PROFIBUS (interface X126)	
PROFIBUS RS485 bus connector	
With angular cable outlet (35°) with screw-type connection, max. transfer rate 12 Mbps	
• Without PG/PC interface	**6ES7972-0BA42-0XA0**
• With PG/PC interface	**6ES7972-0BB42-0XA0**
PROFIBUS FastConnect RS485 bus connector	
With angular cable outlet (35°) with insulation displacement technology, max. transfer rate 12 Mbps	
• Without PG/PC interface	**6ES7972-0BA61-0XA0**
• With PG/PC interface	**6ES7972-0BB61-0XA0**
FastConnect cables for PROFIBUS	
(sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m)	
• FC standard cable GP	**6XV1830-0EH10**
• FC robust cable	**6XV1830-0JH10**
• FC flexible cable	**6XV1831-2K**
• FC trailing cable, sheath color: Petrol	**6XV1830-3EH10**
• FC trailing cable, sheath color: Violet	**6XV1831-2L**
• FC food cable	**6XV1830-0GH10**
• FC ground cable	**6XV1830-3FH10**
• FC FRNC cable GP	**6XV1830-0LH10**
Accessories for PROFINET (interface X150 and X160; X130 only up to 100 Mbps)	
IE FC RJ45 plug 145	
145° cable outlet (10/100 Mbps)	
• 1 unit	**6GK1901-1BB30-0AA0**
• 10 units	**6GK1901-1BB30-0AB0**
• 50 units	**6GK1901-1BB30-0AE0**

Selection and ordering data (continued)

FastConnect cables for Industrial Ethernet/PROFINET	
(sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m)	
• IE FC standard cable GP 2×2	**6XV1840-2AH10**
• IE FC flexible cable GP 2x2	**6XV1870-2B**
• IE FC trailing cable GP 2×2	**6XV1870-2D**
• IE FC trailing cable 2×2	**6XV1840-3AH10**
• IE FC marine cable 2×2	**6XV1840-4AH10**
Accessories for PROFINET (interface X130, for up to 1000 Mbps)	
IE FC RJ45 plug 180	
180° cable outlet (10/100/1000 Mbps)	
• 1 unit	**6GK1901-1BB12-2AA0**
• 10 units	**6GK1901-1BB12-2AB0**
• 50 units	**6GK1901-1BB12-2AE0**
FastConnect cables for Industrial Ethernet/PROFINET	
(sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m)	
• IE FC standard cable GP 4×2	**6XV1878-2A**
• IE FC flexible cable GP 4×2	**6XV1878-2B**
Other accessories	
PROFIBUS FastConnect stripping tool	**6GK1905-6AA00**
Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Dust protection blanking plugs	**6SL3066-4CA00-0AA0**
For sealing unused DRIVE-CLiQ and PROFINET ports; blanking plug (50 units)	
Spare parts	
Bottom cover	**6ES7615-0AC10-0AA0**
Top cover	**6ES7615-0AC10-1AA0**
Spacer	**6SL3064-1BB00-0AA0**
Terminal Kit	**6SL3064-2CB00-0AA0**
• 3 x I/O plug for X122/X132/X142	
• 1 x 24 V plug for X124	
• 5 x DRIVE-CLiQ blanking cover	
Engineering software	
The following engineering software is required for the SIMATIC Drive Controller:	For ordering data for engineering software controllers, see Catalog section 11. For ordering data for engineering software drive systems, see SiePortal.
• STEP 7 Professional V20 for configuring the control functionality	
• STEP 7 Safety Advanced V20 for creating safety-related programs	
• S7-PLCSIM Advanced V7.0 for simulation and validation of the control functionality	
• SINAMICS Startdrive Basic V20[4] or SINAMICS Startdrive Advanced V19 for configuring the integrated drive control (SINAMICS Integrated)	
• SINAMICS DCC V20 (option package for SINAMICS Startdrive) for the graphical configuration of control, computing and logic blocks	
Documentation	

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[3] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages, Software Update Service (SUS)[3] Within the scope of this contract, you will receive all software versions as download for one year. The contract is automatically extended for one more year unless it is canceled three months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) When using the integrated SINAMICS S120 drive control, a memory card size of at least 12 MB is recommended (at least 24 MB for extensive DCC use, e.g. with a DCB Extension Library). A memory card size of at least 256 MB is required for firmware updates.
2) The Ethernet interface X130 supports 10, 100 and 1000 Mbps. For 1000 Mbps, 8-wire cables (4x2) and the 180° FastConnect plug in 1000 Mbps version must be used.
3) Up-to-date information and download availability can be found at this link.
4) The SINAMICS Startdrive Basic commissioning tool is available for free on the internet under this link.

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10/6	**Introduction**
10/6	I/O systems
10/8	**SIMATIC ET 200 systems for the control cabinet**
10/8	SIMATIC ET 200SP
10/12	Interface modules
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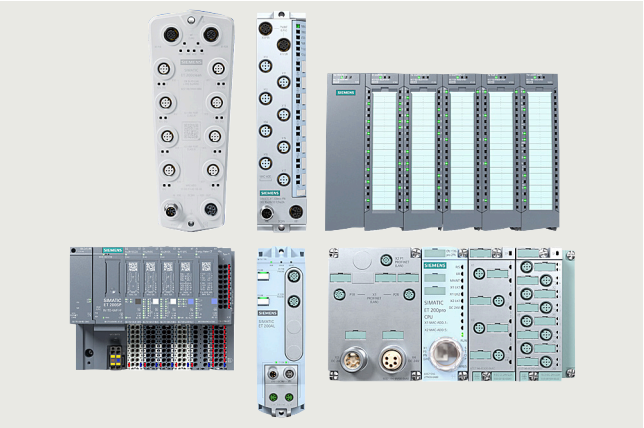


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Overview



SIMATIC ET 200 offers the right solution for every application

With SIMATIC ET 200 a wide range of distributed I/O systems is available - for solutions in the control cabinet or without a control cabinet directly at the machine, as well as for applications in hazardous areas. The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated add-on modules reduce costs and at the same time offer a widely diverse range of possible applications. You can choose from many different combination options: digital and analog inputs/outputs, intelligent modules with CPU functionality, safety engineering, motor starters, pneumatic devices, frequency converters, as well as various different technology modules (e.g. for counting, positioning).

Communication over PROFINET and PROFIBUS, uniform engineering, transparent diagnostic possibilities as well as optimal interfacing to SIMATIC Controllers and HMI devices prove the unique integration of Totally Integrated Automation.

MultiFieldbus

With the MultiFieldbus you can easily and flexibly use different fieldbus systems with SIMATIC ET 200. Due to support of the PROFINET, EtherNet/IP and Modbus/TCP protocols, the MultiFieldbus is designed for use on a wide range of Ethernet controllers.

PROFINET

PROFINET is the open, cross-vendor Industrial Ethernet standard (IEC 61158/61784) for automation.

Based on Industrial Ethernet, PROFINET enables direct communication between field devices (I/O devices) and controllers (I/O controllers), up to and including the solution of isochronous drive controls for Motion Control applications.

As PROFINET is based on Standard Ethernet according to IEEE 802.3, any devices from the field level to the management level can be connected.

In this way, PROFINET enables system-wide communication, supports plant-wide engineering and applies IT standards, such as web server or FTP, right down to field level. Tried and tested fieldbus systems, such as PROFIBUS or AS-Interface, can be easily integrated without any modification to the existing devices.

Overview (continued)

PROFIBUS

PROFIBUS is the international standard (IEC 61158/61784) for the field level. It is the only fieldbus to allow communication both in manufacturing applications and in process-oriented applications.

PROFIBUS is used to connect field devices, e.g. distributed I/O devices or drives, to automation systems such as SIMATIC S7, SIMOTION, SINUMERIK, or PCs.

PROFIBUS is standardized in accordance with IEC 61158 and is a high-performance, open and rugged fieldbus system with short response times. PROFIBUS is available in different forms for various applications.

PROFIBUS DP (distributed I/O)

PROFIBUS DP is used for connecting distributed field devices, e.g. SIMATIC ET 200, or drives with extremely fast response times. PROFIBUS DP is used when sensors/actuators are distributed at the machine or in the plant (e.g. field level).

AS-Interface

AS-Interface is the international standard (IEC 62026/EN 50295) which, as an alternative to the cable harness, links especially cost-effective sensors and actuators for the field level by means of a two-wire line. This two-wire line is also used to supply the individual stations with power. This makes the AS-Interface the ideal partner for PROFINET and PROFIBUS DP. AS-i communications modules in ET 200SP enable the flexible combination of AS-Interface and distributed I/O. AS-Interface transmits standard data and safety data up to PL e / SIL 3 in the same AS-i network. AS-Interface is not only suitable for efficient transmission of digital and analog standard I/O signals but also ideal for the user-friendly connection of EMERGENCY-STOP buttons and protective doors.

IO-Link

The communication standard IO-Link permits the intelligent connection of sensors and switchgear to the control level. IO-Link facilitates the integration of all components in the control cabinet and on the field level - for maximum integration and seamless communication on the final meters to the process.

IO-Link solutions from Siemens ensure maximum precision and cost-effectiveness in any production system. IO-Link is completely integrated in Totally Integrated Automation (TIA) and offers many advantages.

- The open standard permits the networking of devices from different manufacturers
- Simple wiring facilitates the installation process
- Reduced wiring effort saves time and money during installation
- Efficient engineering facilitates configuration and commissioning
- High-speed diagnostics ensures short plant standstill times and high plant availability

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Overview (continued)

- High process transparency permits, for example, efficient energy management

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Overview



SIMATIC ET 200SP video

SIMATIC ET 200SP



The scalable SIMATIC ET 200SP I/O system is a highly flexible, modular I/O system with degree of protection IP20.
Via interface modules, it can exchange IO data of the connected I/O modules with a higher-level PLC. The following interface variants are available for this purpose:

- MultiFieldbus: IM 155-6MF with the Ethernet-based protocols PROFINET, EtherNet/IP and Modbus TCP
- PROFINET: IM 155-6 PN
- PROFIBUS: IM 155-6 DP

Alternatively, as further head-end stations, various PLC, F-PLC and Open Controllers are available as compact S7-1500 Controllers (Distributed Controllers). ET 200SP components in SIPLUS version meet extreme requirements and have a high degree of robustness.
An extensive range of I/O modules, including fail-safe and Ex versions, enable the flexible connection of sensors and actuators:

- Digital input modules (DI), with color coding white
- Digital output modules (DQ), with color coding black
- Analog input modules (AI), with color coding light blue
- Analog output modules (AQ), with color coding dark blue
- Technology modules (TM), with color coding turquoise
- Communications modules (CM), with color coding light gray
- Special modules, with color coding mint green
- Motor starters as direct-on-line starters (DS) and reversing starters (RS), also as F-variant in each case

Overview (continued)

- Pneumatics

Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

Compact design

- Modular design with up to 64 modules
- System-integrated, self-assembling potential groups, potential group supply without power module with infeed of supply voltage via light BaseUnits
- Small size and highly flexible due to the modular design and comprehensive product range
- Up to 16 channels per module
- Permanent wiring
- Hot swapping: Module replacement without tools in RUN
- Startup and operation with slot gaps (free spaces)

Flexible connection system

- Flexible fieldbus connection via BusAdapter (RJ45, M12, FastConnect, plastic or glass fiber-optic cables single-mode or multimode), also as integrated media converter
- Push-in terminals for cross-sections up to 1.5 $mm^2$with wire end ferrule, and up 2.5 mm^2 without wire end ferrule
- BaseUnits for 1-wire or direct multi-wire connection
- PotDis module for system-integrated and space-saving provision of additional potential terminals
- Optimum accessibility for wiring due to spring release and measuring tap next to the conductor opening
- System-integrated, space-saving shielding for installation without tools



SIMATIC ET 200SP shielding video

Safety Integrated

- Easy integration of fail-safe modules
- Easy F parameter assignment via software
- Group-by-group disconnection of non-fail-safe modules

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Overview (continued)

High performance

- Isochronous PROFINET
- Internal data transfer with up to 100 Mbps
- Record analog values and output as of 50 µs
- Record digital values and output as of 1 µs

High-performance technology

- Modules for the functions Servodrive, Counting, Positioning, Weighing, Output cams, PWM, Force measurement, Flow measurement, etc.

Energy efficiency

- Energy Meter for recording electrical variables
- System-integrated PROFIenergy with interval substitute values

Extended functions

- Configuration control:
  application-based adaptation of the actual configuration via user software (option handling)
- Time-based IO:
  time stamping of the signals to the µs
- MSI/MSO:
  Simultaneous access to I/O data from up to 4 PLCs
- MtM:
  Direct data exchange between IO modules (**M**odule-**t**o-**M**odule communication)
- Oversampling:
  n-fold acquisition or output of digital and analog signals within a PN cycle
- Adaptation of measuring range:
  increased resolution by adapting the measuring range to a limited section of a measuring range supported by the analog input module
- Scaling of measured values:
  permits the transmission of the analog value normalized to the required physical value as a REAL value (32-bit floating point)

Communication standards

- PROFINET IO
- EtherNet/IP
- Modbus TCP
- PROFIBUS DP V0/V1
- ET connection for connecting the ET 200AL (IP67)
- IO-Link V1.1
- CAN
- DALI
- AS-Interface
- Point-to-point (RS232, RS485, RS422)
- Freeport
- 3964(R)
- USS
- DMX
- Modbus RTU (master/device)

Overview (continued)

CPU

- PROFINET connection with 3 ports
- I/O controller and PN IO device
- Optional expansion as DP master/slave
- Also as fail-safe variant and Open Controller

Labeling of I/O modules

- Meaningful labeling on the front of the I/O modules
  - Module type in plain text including function class, e.g. "DI 8x24VDC HF"
  - Article No.
  - 2D matrix code with article and serial number (with call via the "Industry Online Support" app, direct link to the support page of the module)
  - Hardware functional status and firmware version
  - Suitable BU type for the respective I/O module
  - Color code of the suitable color-coding plate
  - Connection diagram
- Optionally expandable with
  - Labeling strips
  - Equipment labeling plate

Overview of ET 200SP components

Basic components	Function
CPU	The CPU: • Executes the user program • Is used as I/O controller, I-device on PROFINET IO, or as standalone CPU • Connects the ET 200SP with the I/O devices or the I/O controller • Exchanges data with the I/O modules via the backplane bus Further functions of the CPU: • Communication via PROFIBUS DP (in combination with the CM DP communications module, the CPU can be used as DP master or slave) • Integrated web server • Integrated technology • Integrated trace functionality • Integrated system diagnostics • Integrated safety
Open Controller	As the first controller of this type, the SIMATIC ET 200SP Open Controller combines the functions of a PC-based Software Controller with visualization, PC applications and central I/Os (inputs/outputs) in a single, compact device. • All in one • High system availability • Compact and modular • Rugged • User-friendly design • Efficient engineering in TIA Portal
Interface modules with MultiFieldbus interface (IM 155-6 MF)	The MF interface module: • Supports the three Ethernet protocols PROFINET IO, EtherNet IP and Modbus TCP • Is easy to configure via MultiFieldbus Configuration Tool (MFCT) • Connects ET 200SP with the I/O controller • Exchanges data with the I/O modules via the backplane bus
Interface modules for PROFINET IO (IM 155-6 PN)	The interface module: • Is used as I/O device on PROFINET IO • Connects ET 200SP with the I/O controller • Exchanges data with the I/O modules via the backplane bus

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Overview (continued)

Basic components	Function
Interface module for PROFIBUS DP (IM 155-6 DP)	The interface module: • Is used as DP slave on PROFIBUS DP • Connects ET 200SP with the DP master • Exchanges data with the I/O modules via the backplane bus
SIMATIC BusAdapter (BA)	SIMATIC BusAdapters permit the free selection of the connection system and physical connection for head-end stations with PROFINET or MultiFieldbus interface. Various variants are available for the connection of copper cables or plastic and glass fiber-optic cables. Hybrid copper/fiber-optic variants are also available as integrated media converters. Cable length between 2 stations: max. 100 m (copper), max. 50 m (POF), max 100 m (PCF), max. 3 km (multimode glass fiber-optic cable), max. 20 km (single-mode glass fiber-optic cable). For expanding the station with the I/O system ET 200AL via ET connection, the BA-Send BusAdapter is available
BaseUnit (BU)	The BaseUnits provide the electrical and mechanical connection for the ET 200SP components. • Bright BaseUnits permit a new potential group up to max. 10 A • Dark BaseUnits forward the self-assembling voltage busbars P1, P2 and AUX from the left to the right BaseUnit. • Suitable BaseUnits with 12 to 28 terminals are available for different connection systems (single or direct multi-conductor connection) and functions. • The I/O module is plugged onto the desired BaseUnit and determines the potential assignment of the terminals on the BaseUnit. • For expanding the station with the I/O system ET 200AL via ET connection, the BaseUnit BU-Send is available.
Potential distributor modules (PotDis BU, PotDis TB)	With the potential distributor modules for SIMATIC ET 200SP, additional potentials required within an ET 200SP station can be set up quickly and in a space-saving manner. Due to the free combinability of PotDis-BUs and PotDis-TBs, the potential distributor modules allow a large number of design variants and thus simple adaptation to individual needs. Within the station, existing potentials can be multiplied or even new potential groups can be formed. With 36 terminals per 15 mm width, the PotDis modules require very little space without compromising on the conductor cross-sections (maximum 2.5 mm^2). They allow the connection of voltages up to 48 V DC with a maximum current carrying capacity of 10 A, and with the PotDis TB-BR-W even up to 230 V AC/10 A as well as the possibility to connect a protective conductor.
I/O modules and fail-safe I/O modules	The I/O module determines the function at the terminals. The PLC detects the current process state via the connected sensors and triggers corresponding responses via the connected actuators. Some I/O modules feature extended functions, in part they are also designed as individual operating mode. I/O modules are divided into the following module types; the fail-safe versions are identified by a preceding 'F-' and a yellow module case: • DI (digital input) • DQ (digital output) • AI (analog input) • AQ (analog output) • TM (technology modules) • CM (communications modules) • SM (special modules)

Overview (continued)

Basic components	Function
Protective cover (BU cover)	The ET 200SP system can be operated with any number of slot gaps (BU slot without I/O module). Applications for this include: • partial commissioning • prewired, and currently unequipped options To protect against damage, such slot gaps must be covered by a BU cover. Within the BU cover, an equipment labeling plate can be kept for the possible later use of an I/O module. Versions: • for BaseUnits with a width of 15 mm • for BaseUnits with a width of 20 mm
Server module	The server module concludes the setup of an ET 200SP station. On the server module there are holders for 3 spare fuses (5 × 20 mm). The server module is included in the scope of supply of all head-end stations.
DIN rail according to EN 60715	The DIN rail is the module rack of the ET 200SP I/O system. ET 200SP is mounted on the DIN rail.
SIMATIC system rail	For a redundant R1 setup of the ET 200SP I/O system, mounting on the SIMATIC system rail is mandatory.
Coding element	When plugging an I/O module onto a BaseUnit for the first time, the coding element moves from the I/O module to the BaseUnit. There it prevents the destruction of the ET 200SP components in the event of a subsequent module replacement with incorrectly selected I/O module. The coding element is available in two versions: • Mechanical coding element • Electronic coding element: additionally features an electronic, re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules, parameter data for IO-Link master). Thus these data are automatically backed up during a module replacement.
System-integrated shield connection	The shield connection permits the connection of cable shields. Compared to external shield supports, the system offers the following advantages: • Quick installation without tools by plugging the shield connection element onto the BaseUnit • Automatic low-impedance connection to the functional grounding (mounting rail) • Optimized EMC properties by separating the supply voltage lines from the signal cables by means of the shield connection element and short, unshielded cable lengths • Requires little space
Labeling strips	Optionally, for system-specific marking the head-end stations and I/O modules can be equipped with labeling strips (13 x 31 mm). The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow: • 500 strips on the roll, for printing on thermal transfer printers. Core diameter 40 mm, outer diameter 70 mm, width 62 mm. • 10 DIN A4 sheets with 100 strips each, card 180 g/mm^2, perforated, for printing with a laser printer direct from TIA Portal or via print templates.

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Overview (continued)

Basic components	Function
Equipment labeling plate	Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, potential distributor modules (PotDis BU and PotDis TB), and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly: • The inscription on the front is not covered • Simple label replacement when replacing a module • No parallax errors when marking the BaseUnits on the mounting plate The size of the inscribable area of the labels is 14.8 x 10.5 mm (W x H)
Color-coded labels	The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the process terminals. The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals as well as potential distributor modules can also be marked using color-coded labels. Color-coded labels are supplied in packs of 10 or 50 labels. Advantages of the color-coded labels: • Quick installation (one label for marking up to 16 terminals) • Avoidance of wiring errors • Simple detection of potentials during servicing

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Overview



SIMATIC ET 200SP MultiFieldbus video



Thanks to their wide scope of functions, the interface modules of the scalable SIMATIC ET 200SP I/O system, even in their basic versions, cover a wide range of applications. The basic functions of the interface modules include:

- Short data update times of typically 1 ms
- Single Hot Swap (withdrawing and insertion of an I/O module during operation without impairing the communication with the remaining modules)
- Operation with gaps (empty BaseUnits)
- Complete diagnostic support, extending to channel-by-channel diagnostics
- Configuration control / option handling (adaptation of the actual configuration via user program)
- Device replacement without programming device, with automatic re-initialization, with and without topological configuring
- I&M data 0 to 3 (electronic rating plate with non-volatile storage of plant data)
- Firmware update
- Pluggable 24 V DC supply connection
- Mains/voltage failure buffering time of at least 5 ms or 10 ms
- Labeling option via optional labeling strips and equipment labeling plates

When using PROFINET interface modules, the following basic functions are also included:

Overview (continued)

- Media redundancy (MRP)
- Integrated 2-port switch
- Freely selectable connection system (Standard function class and above) and physical connection (High Feature function class and above) by means of SIMATIC BusAdapters, also as system-integrated media converter from fiber-optic to copper cable. Can also be used for interface modules with MultiFieldbus interface.
- Reset button for simple return to factory settings without the need for programming device
- Automatic synchronization of the backplane bus to the PROFINET cycle to minimize the response time fluctuations (jitter)

Listed below is a short overview of the interface modules available for the ET 200SP, showing the essential differences. An up-to-date, clear and more precise comparison of functions of the different interface modules is offered by the TIA Selection Tool.

SIMATIC IM 155-6 DP High Feature with PROFIBUS connection

- Max. 32 I/O modules, also PROFIsafe modules with complete diagnostic support.
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 244 bytes in each case for input and output data per module and per station
- Data update time: typ. 5 ms
- PROFIBUS connection via 9-pin SUB-D socket
- Package includes server module and PROFIBUS connector with PG socket

SIMATIC IM 155-6 PN Basic with PROFINET connection

- Max. 12 I/O modules, no PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and per station
- Data update time: typ.1 ms
- PROFINET connection via 2 integrated RJ45 sockets (integrated 2-port switch)
- Package includes server module

SIMATIC IM 155-6 PN Standard with a PROFINET interface for SIMATIC BusAdapters

- Two types of delivery:
  - As package with IM155-6PN ST, with pre-assembled BA 2xRJ45 BusAdapter, including server module
  - As package with IM155-6PN ST, without BusAdapter, including server module
- Max. 32 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 288 bytes in each case for input and output data per module and max. 1440 bytes per station (depending on configuration)
- Data update time: typ.1 ms
- Selection of the type of connection of the PROFINET by means of SIMATIC BusAdapter (BusAdapter for copper cables only)

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Overview (continued)

SIMATIC IM 155-6 PN/2 High Feature, 2-port IM with one slot for SIMATIC BusAdapters

- Max. 64 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 288 bytes in each case for input and output data per module and max. 1440 bytes per station (depending on configuration)
- Fast data refresh time from 250 µs, also in isochronous mode
- S2 system redundancy
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

SIMATIC IM 155-6 MF High Feature, MultiFieldbus IM with two slots for SIMATIC BusAdapters

Differences from the 2-port IM 155-6 PN/2 High Feature:

- Multi-protocol capability
  Operation on Ethernet controllers via the PROFINET, EtherNet/IP and Modbus protocols
- Compatible with IM 155-6 MF High Feature (as of 6ES7155-6AU01-0CN0);
  Exception: Isochronous mode and prioritized startup
- Shared device:
  Simultaneous access from different controllers via different Ethernet protocols PROFINET, EtherNet/IP and Modbus TCP
- Local data links:
  Deterministic, easy-to-configure data exchange between controllers, also via different Ethernet protocols PROFINET, EtherNet/IP and Modbus TCP

SIMATIC IM 155-6 PN/3 High Feature, 3-port IM with two slots for SIMATIC BusAdapters

Additional functions compared with 2-port IM 155-6 PN/2 High Feature:

- Second slot for SIMATIC BusAdapter, max. 3 ports can be used
- Local IO data coupling between up to 4 controllers

SIMATIC IM 155-6 PN High Speed with a PROFINET interface for SIMATIC BusAdapters

- Max. 30 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and max. 968 bytes per station (depending on configuration)
- Fast data refresh time from isochronous mode from 125 µs
- Performance upgrade for PROFINET
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

Overview (continued)

SIMATIC IM 155-6 PN R1 redundant interface module



SIMATIC ET 200SP R1 with two IM 155-6 PN R1, BaseUnit M0, BusAdapter, and system rail

- Can be used for high availability applications in combination with SIMATIC S7-1500H and TIA Portal
- Redundancy via two identical ET 200SP interface modules, which are selected as required
- Interface module switchover possible during operation
- SIMATIC system rail absolutely necessary

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Selection and ordering data

MultiFieldbus IM 155-6 MF High Feature interface module With server module, without SIMATIC BusAdapter; PROFINET, EtherNet/IP and Modbus TCP; isochronous mode; PROFINET Security Class 1	**6ES7155-6MU01-0CN0**
PROFINET IM 155-6 PN Basic interface module With server module; two integrated RJ45 sockets	**6ES7155-6AR01-0AN0**
PROFINET IM 155-6 PN Standard interface module With server module	
• With mounted SIMATIC BA 2xRJ45 BusAdapter	**6ES7155-6AA02-0BN0**
• Without SIMATIC BusAdapter	**6ES7155-6AU02-0BN0**
PROFINET IM 155-6 PN/2 High Feature interface module 2-port IM, with server module, without SIMATIC BusAdapter	**6ES7155-6AU01-0CN0**
PROFINET IM 155-6 PN/3 High Feature interface module 3-port IM, with server module, without SIMATIC BusAdapter	**6ES7155-6AU30-0CN0**
PROFINET IM 155-6 PN High Speed interface module With server module, without SIMATIC BusAdapter	**6ES7155-6AU00-0DN0**
PROFIBUS IM 155-6 DP High Feature interface module With server module, with PROFIBUS plug with PG socket	**6ES7155-6BA01-0CN0**
Redundant PROFINET IM 155-6 PN R1 interface module 2-port IM, with server module, without SIMATIC BusAdapter, R1 redundancy	**6ES7155-6AU00-0HM0**
Accessories	
Strain relief for the PROFINET cable System-integrated strain relief for High Feature PN interface modules (5 units)	**6ES7193-6RA00-1AN0**
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules, Standard function class or above; max. cable length 50 m	**6ES7193-6AR00-0AA0**
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules, Standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	**6ES7193-6AF00-0AA0**
BA 2xM12 BusAdapter For IM 155-6PN ST, HF; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	**6ES7193-6AM00-0AA0**
SIMATIC BA 2xSCRJ BusAdapter For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP00-0AA0**
SIMATIC BA SCRJ/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP20-0AA0**
SIMATIC BA SCRJ/FC BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP40-0AA0**

Selection and ordering data (continued)

SIMATIC BA 2XLC BusAdapter For PROFINET interface modules from High Feature function class or above; with LC fiber-optic connection; for increased vibration and EMC load capacity; max. cable length 2 km	**6ES7193-6AG00-0AA0**
SIMATIC BA LC/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	**6ES7193-6AG20-0AA0**
SIMATIC BA LC/FC BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	**6ES7193-6AG40-0AA0**
SIMATIC BA 2xLC-LD BusAdapter For IM 155-6 PN HF, IM 155-6 PN R1; 2 x LC-LD connections	**6ES7193-6AG50-0AA0**
SIMATIC BA LC-LD/RJ45 BusAdapter For IM 155-6 PN HF, IM 155-6 PN R1; with media converter glass FOC - copper; 1 x LC-LD connection, 1 x RJ45 connection	**6ES7193-6AG60-0AA0**
SIMATIC BA LC-LD/M12 BusAdapter For IM 155-6 PN HF, IM 155-6 PN R1; with media converter glass FOC - copper; 1 x LC-LD connection, 1 x M12 connection	**6ES7193-6AG70-0AA0**
Station expansion with IP67 I/O system ET 200AL	
ET 200SP BA-Send 1 x FC BusAdapter	**6ES7193-6AS00-0AA0**
BaseUnit BU-Send	**6ES7193-6BN00-0NE0**
Other accessories	
Unlatching strap 10 units, for push-pull PROFINET connector, e.g. when using the BusAdapter BA 2xM12	**6ES7193-6DL00-2AA0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
SIMATIC system rail With mounting rail according to EN 60715 (35 × 7.5), with 6 mm profile grooves, B-type	
• Length: 482.6 mm for 19" cabinets	**6ES7193-6MR00-0AA0**
• Length: 530 mm for 600 mm cabinets	**6ES7193-6MR00-0BA0**
• Length: 830 mm for 900 mm cabinets	**6ES7193-6MR00-0CA0**
• Length 2 m	**6ES7193-6MR00-0DA0**
DIN rail 35 mm	
• Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
• Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
• Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**

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Selection and ordering data (continued)

• Length 2 m	**6ES5710-8MA41**
Manuals for ET 200SP distributed I/O system SIMATIC ET 200SP Manual Collection: PDF file with the following content: • Basic information System manual, product information, overview tables, correction information or manual supplements • Device-specific information Device manuals for the interface modules, PLC, OC and I/O modules, including fail-safe and motor starters • Comprehensive information Function manuals The ET 200SP Manual Collection can be downloaded from the Internet as a PDF file under this link.	
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**
Spare parts	
Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules, CPUs and Open Controllers	**6ES7193-6PA00-0AA0**
Power supply connector for ET 200SP head-end stations (interface module, CPU and Open Controller) For connecting the 24 V DC supply voltage, push-in variant; included in scope of supply of the head-end station	
With push-in terminals (10 units)	**6ES7193-4JB00-0AA0**

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Technical specifications

Article number	6ES7155-6AR01-0AN0	6ES7155-6AA02-0BN0	6ES7155-6AU02-0BN0	6ES7155-6MU01-0CN0
	ET 200SP, IM 155-6 PN Basic	ET 200SP, IM 155-6 PN ST incl. BA 2xRJ45	ET 200SP, IM 155-6 PN ST	ET 200SP, IM 155-6 MF HF
General information				
Product type designation	IM 155-6 PN BA	IM 155-6 PN ST incl. BA 2x RJ45 and server module	IM 155-6 PN ST	IM 155-6 MF HF
Product function				
• I&M data	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping
• Isochronous mode	No	No	No	Yes
• IRT	Yes	Yes	Yes	Yes
• Tool changer				Yes; Docking station and docking unit
• Local coupling, IO data	Yes	Yes	Yes	Yes
- Number of coupling modules	6; 1x output + max. 5x input	6; 1x output + max. 5x input	6; 1x output + max. 5x input	6; 1x output + max. 5x input
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	V20	V20	V20	V20
• STEP 7 configurable/integrated from version	V5.7 SP3	V5.7 SP3	V5.7 SP3	V5.7 SP3
• PROFINET from GSD version/GSD revision	GSDML V2.45	GSDML V2.45	GSDML V2.45	GSDML V2.45
• Multi Fieldbus Configuration Tool (MFCT)				V1.5.2.0 or higher
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes
Input current				
Current consumption (rated value)	200 mA	350 mA	350 mA	550 mA
Address area				
Address space per station				
• Address space per station, max.	128 byte	1 440 byte	1 440 byte	1 440 byte
Hardware configuration				
Rack				
• Quantity of operable ET 200SP modules, max.	16	32	32	64
• Quantity of operable ET 200AL modules, max.	0	16	16	16
Submodules				
• Number of submodules per station, max.	256	256	256	256
Interfaces				
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; 2 integrated RJ45 ports	Yes; with BusAdapter	Yes; with BusAdapter	Yes; with BusAdapter
• Number of ports	2; integrated RJ45 ports	2; with BusAdapter	2; with BusAdapter	2; with BusAdapter
• integrated switch	Yes	Yes	Yes	Yes
• BusAdapter (PROFINET)	No	Yes; BA 2x RJ45, BA 2x FC, BA 2x M12	Yes; BA 2x RJ45, BA 2x FC, BA 2x M12	Yes; BA 2x RJ45, BA 2x M12, BA 2x FC
Protocols				
• PROFINET IO device	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes
• Media redundancy	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client
PROFINET IO Device				
- Services				
- IRT	Yes; 1 ms to 4 ms at an interval of 125 µs	Yes; 1 ms to 4 ms at an interval of 125 µs	Yes; 1 ms to 4 ms at an interval of 125 µs	Yes; 250 µs to 4 ms in 125 µs frame
- Dynamic Frame Packing (DFP)	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7155-6AR01-0AN0	6ES7155-6AA02-0BN0	6ES7155-6AU02-0BN0	6ES7155-6MU01-0CN0
	ET 200SP, IM 155-6 PN Basic	ET 200SP, IM 155-6 PN ST incl. BA 2xRJ45	ET 200SP, IM 155-6 PN ST	ET 200SP, IM 155-6 MF HF
- Fast Forwarding	Yes	Yes	Yes	Yes
- Fragmentation	Yes	Yes	Yes	Yes
- PROFIenergy	Yes	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes	Yes
- Shared device	No	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.		4	4	14; 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
Interface types				
RJ 45 (Ethernet)				
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes	Yes	Yes	Yes
• Autonegotiation	Yes	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes	Yes
Protocols				
PROFINET IO	Yes	Yes	Yes	Yes
PROFIsafe	No	Yes	Yes	Yes
PROFIBUS	No	No	No	No
EtherNet/IP	No	No	No	Yes
Modbus TCP	No	No	No	Yes
Number of connections				
• Number of MtM communication relationships/connections, max.				16
Redundancy mode				
• PROFINET system redundancy (S2)	No	No	No	Yes; NAP S2
• PROFINET system redundancy (R1)	No	No	No	No
• H-Sync forwarding				Yes
- Media redundancy				
- MRP	Yes	Yes	Yes	Yes
- MRPD	Yes	Yes	Yes	Yes
EtherNet/IP				
- Services				
- CIP Implicit Messaging				Yes
- CIP Explicit Messaging				Yes
- CIP Safety				No
- Configuration control via Explicit Messaging				No
- Shared device				Yes; 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
- Number of scanners with shared device, max.				2
- Updating times				
- Requested Packet Interval (RPI)				2 ms
- Address area				
- Address space per module, max.				288 byte; (246 byte outputs / 288 byte inputs)
- ForwardOpen (Class1 & 32 bit Header)				500 byte; (246 byte outputs / 500 byte inputs)
- LargeForwardOpen (Class3)				4 002 byte
- Connections				
- Number of rack connections				2
Modbus TCP				
- Services				
- read coils (code=1)				Yes
- read discrete inputs (code=2)				Yes

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Technical specifications (continued)

Article number	6ES7155-6AR01-0AN0	6ES7155-6AA02-0BN0	6ES7155-6AU02-0BN0	6ES7155-6MU01-0CN0
	ET 200SP, IM 155-6 PN Basic	ET 200SP, IM 155-6 PN ST incl. BA 2xRJ45	ET 200SP, IM 155-6 PN ST	ET 200SP, IM 155-6 MF HF
- Read Holding Registers (Code=3)				Yes
- Read Input Register (Code=4)				Yes
- write single coil (code=5)				Yes
- Write Single Register (Code=6)				Yes
- write multiple coils (code=15)				Yes
- Write Multiple Registers (Code=16)				Yes
- Read/Write Multiple Registers (Code=23)				Yes
- Parameter change by master				Yes
- Modbus TCP Security Protocol				No
- Address space per station				
- Address space per station, max.				500 byte; (246 byte outputs / 500 byte inputs)
- Access-consistent address space				250 byte; (246 byte outputs / 250 byte inputs)
- Updating time				
- I/O request interval				2 ms
- Connections				
- number of connections per device				9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)
Open IE communication				
• TCP/IP	Yes	Yes	Yes	Yes
• UDP	Yes	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes	Yes
• ARP	Yes	Yes	Yes	Yes
• IGMP	Yes	Yes	Yes	Yes
• Multicast	Yes	Yes	Yes	Yes
• Broadcast	Yes	Yes	Yes	Yes
• IPv4	Yes	Yes	Yes	Yes
• IPv6	No	No	No	No
Isochronous mode				
Equidistance				Yes
shortest clock pulse				250 µs
max. cycle				4 ms
Bus cycle time (TDP), min.				250 µs
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• NS LED				Yes; green/red LED
• MS LED				Yes; green/red LED
• IO LED				Yes; red-green-yellow LED
• Connection display LINK TX/RX	Yes; 2x green LED	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Standards, approvals, certificates				
Network loading class	3	3	3	3
Security				
PROFINET Security Class	1	1	1	1

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Technical specifications (continued)

Article number	6ES7155-6AR01-0AN0	6ES7155-6AA02-0BN0	6ES7155-6AU02-0BN0	6ES7155-6MU01-0CN0
	ET 200SP, IM 155-6 PN Basic	ET 200SP, IM 155-6 PN ST incl. BA 2xRJ45	ET 200SP, IM 155-6 PN ST	ET 200SP, IM 155-6 MF HF
signed firmware update	Yes	Yes	Yes	Yes
Secure Boot	No	No	No	No
safely removing data	Yes	Yes	Yes	Yes
data integrity	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Connection method				
ET-Connection				
• via BU/BA Send	No	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules
Mechanics/material				
Strain relief	No	Yes; Optional	Yes; Optional	Yes; Optional
Dimensions				
Width	35 mm	50 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm	74 mm
Weights				
Weight, approx.	125 g	120 g; without BusAdapter	120 g; without BusAdapter	120 g; without BusAdapter

Article number	6ES7155-6AU01-0CN0	6ES7155-6AU30-0CN0	6ES7155-6AU00-0HM0	6ES7155-6AU00-0DN0
	ET 200SP, IM155-6PN/2 HF	ET 200SP, IM155-6PN/3 HF	ET 200SP, IM 155-6 PN R1	ET 200SP, IM155-6PN HS
General information				
Product type designation	IM 155-6 PN/2 HF	IM 155-6 PN/3 HF	IM 155-6 PN R1	IM 155-6 PN HS
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M4	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping
• Isochronous mode	Yes	Yes	No	Yes
• IRT			No	Yes
• Tool changer	Yes; Docking station and docking unit	Yes; Docking station and docking unit		
• Local coupling, IO data		Yes		
- Number of coupling modules		16		
- Number of coupling submodules per module		4		
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	V15.1	V15.1	V19	V14
• STEP 7 configurable/integrated from version	use GSD file	use GSD file	use GSD file	V5.5 SP4
• PROFINET from GSD version/GSD revision	GSDML V2.43	GSDML V2.45	GSDML V2.45	GSDML V2.45
CiR - Configuration in RUN				
Reparameterization possible in RUN			Yes	
reconfiguration possible in RUN			Yes	
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7155-6AU01-0CN0	6ES7155-6AU30-0CN0	6ES7155-6AU00-0HM0	6ES7155-6AU00-0DN0
	ET 200SP, IM155-6PN/2 HF	ET 200SP, IM155-6PN/3 HF	ET 200SP, IM 155-6 PN R1	ET 200SP, IM155-6PN HS
Input current				
Current consumption (rated value)		175 mA; At 24 V, 2 slots 2x RJ45 BusAdapter, no I/O modules		
Address area				
Address space per station				
• Address space per station, max.	1 440 byte	1 440 byte	1 440 byte	968 byte
Hardware configuration				
Rack				
• Quantity of operable ET 200SP modules, max.	64	64	64	30
• Quantity of operable ET 200AL modules, max.	16	16	0	0
Submodules				
• Number of submodules per station, max.	256	256	256	125
Interfaces				
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1; 2 ports (switch)	1; 3 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; with BusAdapter	Yes; with BusAdapter	Yes; with BusAdapter	Yes; with BusAdapter
• Number of ports	2; with BusAdapter	3; with 2 compatible BusAdapters:	2; with BusAdapter	2; with BusAdapter
• integrated switch	Yes	Yes	Yes	Yes
• BusAdapter (PROFINET)	Yes; BA 2x RJ45, BA 2x FC, BA 2x M12, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC, BA 2x LC, BA LC/RJ45, BA LC/FC	Yes; BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC, BA 2x LC, BA LC/RJ45, BA LC/FC	Yes; BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x LC-LD, BA LC-LD/RJ45, BA LC-LD/M12	Yes; BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC, BA 2x LC, BA LC/RJ45, BA LC/FC
Protocols				
• PROFINET IO Device	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes
• Media redundancy	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client / HRP client
PROFINET IO Device				
- Services				
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame	No	Yes; 125 µs to 4 ms in 125 µs frame
- Dynamic Frame Packing (DFP)	No	No	No	No
- PROFIenergy	Yes	Yes	No	Yes
- Prioritized startup	Yes	Yes	No	Yes
- Shared device	Yes	Yes	No	Yes
- Number of IO Controllers with shared device, max.	4	4		4
Interface types				
RJ 45 (Ethernet)				
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes	Yes	Yes	Yes
• Autonegotiation	Yes	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes	Yes
Protocols				
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes
PROFIsafe	Yes	Yes	Yes	Yes
PROFIBUS	No	No	No	No
EtherNet/IP	No	No	No	No
Modbus TCP	No	No	No	No
Number of connections				

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Technical specifications (continued)

Article number	6ES7155-6AU01-0CN0 ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CN0 ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0HM0 ET 200SP, IM 155-6 PN R1	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS
• Number of MtM communication relationships/connections, max.	16	16		
Redundancy mode				
• PROFINET system redundancy (S2)	Yes; NAP S2	Yes; NAP S2	No	No
• PROFINET system redundancy (R1)	No	No	Yes	No
• H-Sync forwarding	Yes	Yes	Yes	Yes
- Media redundancy				
- MRP	Yes	Yes	Yes	Yes
- MRPD	No	No	No	Yes
Open IE communication				
• TCP/IP	Yes	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes	Yes
Isochronous mode				
Equidistance	Yes	Yes		Yes
shortest clock pulse	250 µs	250 µs		125 µs
max. cycle	4 ms	4 ms		4 ms
Bus cycle time (TDP), min.	250 µs	250 µs		125 µs
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• ACT LED			Yes; green LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Standards, approvals, certificates				
Network loading class	3	2	3	3
Security				
PROFINET Security Class	1	1	1	1
signed firmware update			Yes	
Secure Boot			No	
safely removing data			No	
data integrity			Yes	
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-25 °C; No condensation
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-25 °C; No condensation
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Connection method				
ET-Connection				
• via BU/BA Send	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules	No	No
Mechanics/material				
Strain relief	Yes; Optional	Yes; Optional		

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Technical specifications (continued)

Article number	6ES7155-6AU01-0CN0	6ES7155-6AU30-0CN0	6ES7155-6AU00-0HM0	6ES7155-6AU00-0DN0
	ET 200SP, IM155-6PN/2 HF	ET 200SP, IM155-6PN/3 HF	ET 200SP, IM 155-6 PN R1	ET 200SP, IM155-6PN HS
Dimensions				
Width	50 mm	100 mm	50 mm	50 mm
Height	117 mm	117 mm	138 mm	117 mm
Depth	74 mm	74 mm	89 mm	74 mm
Weights				
Weight, approx.	120 g; without BusAdapter	220 g; without BusAdapter	192 g; without BusAdapter	147 g; without BusAdapter

Article number	6ES7155-6BA01-0CN0
	ET 200SP, IM155-6DP HF incl. DP-Connect.
General information	
Product type designation	IM 155-6 DP HF
Product function	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V15 SP1
• STEP 7 configurable/integrated from version	V5.5 SP4, only up to FW V3.1
• PROFIBUS from GSD version/GSD revision	si0181ab.gs* (V04.02.13, Rev.3, Rev.5)
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Address area	
Address space per station	
• Address space per station, max.	244 byte
Hardware configuration	
Rack	
• Quantity of operable ET 200SP modules, max.	32
• Quantity of operable ET 200AL modules, max.	16
Interfaces	
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	
• RS 485	Yes; 1 integrated RS 485 socket
• Output current of the interface, max.	90 mA
Protocols	
• PROFIBUS DP device	Yes
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
Protocols	
Supports protocol for PROFINET IO	No
PROFIsafe	Yes
PROFIBUS	Yes
EtherNet/IP	No
Modbus TCP	No
Open IE communication	
• TCP/IP	No
PROFIBUS DP	
- Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- DPV0	Yes

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Technical specifications (continued)

Article number	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.
- DPV1	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Connection display DP	Yes; green DP LED
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Connection method	
ET-Connection	
• via BU/BA Send	Yes; + 16 ET 200AL modules
Dimensions	
Width	50 mm
Height	117 mm
Depth	74 mm
Weights	
Weight, approx.	150 g

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Overview



Thanks to their wide scope of functions, the interface modules of the scalable SIMATIC ET 200SP I/O system, even in their basic versions, cover a wide range of applications. The basic functions of the interface modules include:

- Short data update times of typically 1 ms
- Single hot swap (withdrawing and insertion of an I/O module during operation without impairing the communication with the remaining modules)
- Operation with gaps (empty BaseUnits)
- Complete diagnostic support, extending to channel-by-channel diagnostics
- Configuration control / option handling (adaptation of the actual configuration via user program)
- Device replacement without programming device, with automatic re-initialization, with and without topological configuring
- I&M data 0 to 3 (electronic rating plate with non-volatile storage of plant data)
- Firmware update
- Pluggable 24 V DC supply connection
- Mains/voltage failure buffering time of at least 5 ms or 10 ms
- Labeling option via optional labeling strips and equipment labeling plates

When using PROFINET interface modules, the following basic functions are also included:

- Media redundancy (MRP)
- Integrated 2-port switch
- Freely selectable connection system (Standard function class and above) and physical connection (High Feature function class and above) by means of SIMATIC BusAdapters, also as system-integrated media converter from fiber-optic to copper cable. Can also be used for interface modules with MultiFieldbus interface.
- Reset button for simple return to factory settings without the need for programming device
- Automatic synchronization of the backplane bus to the PROFINET cycle to minimize the response time fluctuations (jitter)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS PROFINET interface module IM 155-6 PN Standard	
(Extended temperature range and exposure to environmental substances)	
IM 155-6 PN ST, max. 32 I/O modules, 16 ET 200AL modules, multi hot swap	**6AG1155-6AA02-7BN0**
IM 155-6PN ST, including server module, without BusAdapter, plus extended mains buffering time	**6AG1155-6AU02-7BN0**
SIPLUS High Feature interface module	
(Extended temperature range and exposure to environmental substances)	
IM 155-6 DP HF, with server module, with multi-hot swap, including PROFIBUS connector	**6AG1155-6BA01-7CN0**
IM 155-6 PN HF, incl. server module, without BusAdapter	**6AG1155-6AU01-2CN0**
IM155-6 MF HF, max. 64 I/O modules and 16 ET 200AL modules, multi hot swap	**6AG1155-6MU01-2CN0**
IM155-6 MF HF, max. 64 I/O modules and 16 ET 200AL modules, multi hot swap	**6AG1155-6MU01-7CN0**
SIPLUS PROFINET redundant interface module IM 155-6 PN R1	
2-port interface module, with server module, without SIMATIC BusAdapter, R1 redundancy	**6AG1155-6AU00-7HM0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19"	**6AG1193-6AB00-0AA0**
Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	
Other accessories	See SIMATIC ET 200SP, interface module IM 155-6

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Technical specifications

Article number	6AG1155-6AA02-7BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6AG1155-6AU00-7HM0 SIPLUS ET 200SP IM155-6PN R1	6AG1155-6AU01-2CN0 SIPLUS ET 200SP IM155-6PN HF	6AG1155-6BA01-7CN0 SIPLUS ET 200SP IM155-6DP HF
General information				
Product type designation	IM 155-6 PN ST incl. BA 2x RJ45 and server module	IM 155-6 PN R1	IM 155-6 PN/2 HF	IM 155-6 DP HF
Product function				
• I&M data	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping
• Isochronous mode	No	No	Yes	No
• IRT	Yes	No		
• Tool changer			Yes; Docking station and docking unit	
• Local coupling, IO data	Yes		No	
- Number of coupling modules	6; 1x output + max. 5x input			
• Local coupling, data records			No	
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	V19	see entry ID: 109746275	see entry ID: 109746275
• STEP 7 configurable/integrated from version		use GSD file		
• PROFINET from GSD version/GSD revision	GSDML V2.45	GSDML V2.45		
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes		
Input current				
Current consumption (rated value)	350 mA			
Address area				
Address space per station				
• Address space per station, max.	1 440 byte	1 440 byte	1 440 byte; Dependent on configuration	244 byte; per input / output
Hardware configuration				
Rack				
• Modules per rack, max.			64; + 16 ET 200AL modules	
• Quantity of operable ET 200SP modules, max.	32	64		32
• Quantity of operable ET 200AL modules, max.	16	0		16
Submodules				
• Number of submodules per station, max.	256	256	256	
Time stamp				
Accuracy			10 ms	
Interfaces				
Transmission procedure	100BASE-TX	100BASE-TX		
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)	
Number of PROFIBUS interfaces				1
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; with BusAdapter	Yes; with BusAdapter		
• RS 485				Yes; 1 integrated RS 485 socket
• Number of ports	2; with BusAdapter	2; with BusAdapter	2; via BusAdapter	
• integrated switch	Yes	Yes	Yes	
• BusAdapter (PROFINET)	Yes	Yes	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	

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Technical specifications (continued)

Article number	6AG1155-6AA02-7BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6AG1155-6AU00-7HM0 SIPLUS ET 200SP IM155-6PN R1	6AG1155-6AU01-2CN0 SIPLUS ET 200SP IM155-6PN HF	6AG1155-6BA01-7CN0 SIPLUS ET 200SP IM155-6DP HF
• Output current of the interface, max.				90 mA
Protocols				
• PROFINET IO device	Yes	Yes	Yes	
• PROFIBUS DP device				Yes
• Open IE communication	Yes	Yes	Yes	
• Media redundancy	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP	
PROFINET IO Device				
- Services				
- IRT	Yes; 1 ms to 4 ms at an interval of 125 µs	No	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	
- Dynamic Frame Packing (DFP)	Yes	No		
- Fast Forwarding	Yes			
- Fragmentation	Yes			
- PROFIenergy	Yes	No	Yes	
- Prioritized startup	Yes	No	Yes	
- Shared device	Yes	No	Yes	
- Number of IO Controllers with shared device, max.	4		4	
Interface types				
RJ 45 (Ethernet)				
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• 10 Mbps			No	
• 100 Mbps	Yes	Yes	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• Autonegotiation	Yes	Yes	Yes	
• Autocrossing	Yes	Yes	Yes	
RS 485				
• Transmission rate, max.				12 Mbit/s
Protocols				
Supports protocol for PROFINET IO	Yes	Yes	Yes	No
PROFIsafe	Yes	Yes	Yes	Yes
PROFIBUS	No	No	No	Yes
EtherNet/IP	No	No	No	No
Modbus TCP	No	No		No
Number of connections				
• Number of MtM communication relationships/connections, max.			16	
Redundancy mode				
• PROFINET system redundancy (S2)	No	No	Yes; NAP S2	
• PROFINET system redundancy (R1)	No	Yes	No	
• H-Sync forwarding		Yes	Yes	
- Media redundancy				
- MRP	Yes	Yes	Yes	
- MRPD	Yes	No	No	
Open IE communication				
• TCP/IP	Yes	Yes	Yes	No
• UDP	Yes			
• SNMP	Yes	Yes	Yes	
• LLDP	Yes	Yes	Yes	
• ARP	Yes			
• IGMP	Yes			

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Technical specifications (continued)

Article number	6AG1155-6AA02-7BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6AG1155-6AU00-7HM0 SIPLUS ET 200SP IM155-6PN R1	6AG1155-6AU01-2CN0 SIPLUS ET 200SP IM155-6PN HF	6AG1155-6BA01-7CN0 SIPLUS ET 200SP IM155-6DP HF
• Multicast	Yes			
• Broadcast	Yes			
• IPv4	Yes			
• IPv6	No			
PROFIBUS DP				
- Services				
- SYNC capability				Yes
- FREEZE capability				Yes
- DPV0				Yes
- DPV1				Yes
Isochronous mode				
Equidistance			Yes	
shortest clock pulse			250 µs	
max. cycle			4 ms	
Bus cycle time (TDP), min.			250 µs	
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• ACT LED		Yes; green LED		
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	
• Connection display DP				Yes; green DP LED
Standards, approvals, certificates				
Network loading class	3	3	3	
Security				
PROFINET Security Class	1	1		
signed firmware update	Yes	Yes		
Secure Boot		No		
safely removing data	Yes	No		
data integrity	Yes	Yes		
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; +85 °C for 10 min (OT4, ST1/ST2 acc. to EN 50155)	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m	5 000 m	5 000 m

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Technical specifications (continued)

Article number	6AG1155-6AA02-7BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6AG1155-6AU00-7HM0 SIPLUS ET 200SP IM155-6PN R1	6AG1155-6AU01-2CN0 SIPLUS ET 200SP IM155-6PN HF	6AG1155-6BA01-7CN0 SIPLUS ET 200SP IM155-6DP HF
• Ambient air temperature-barometric pressure-altitude		Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6-AG1193-6AB00-0AA0)		Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6A-G1193-6AB00-0AA0)		Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability

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Technical specifications (continued)

Article number	6AG1155-6AA02-7BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6AG1155-6AU00-7HM0 SIPLUS ET 200SP IM155-6PN R1	6AG1155-6AU01-2CN0 SIPLUS ET 200SP IM155-6PN HF	6AG1155-6BA01-7CN0 SIPLUS ET 200SP IM155-6DP HF
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method				
ET-Connection				
• via BU/BA Send	Yes; + 16 ET 200AL modules	No	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules
Mechanics/material				
Strain relief	Yes; Optional		Yes; Optional	
Dimensions				
Width	50 mm	50 mm	50 mm	50 mm
Height	117 mm	138 mm	117 mm	117 mm
Depth	74 mm	89 mm	74 mm	74 mm
Weights				
Weight, approx.	125 g; without BusAdapter	192 g; without BusAdapter	120 g; without BusAdapter	150 g

Article number	6AG1155-6MU01-2CN0 SIPLUS ET 200SP IM155-6 MF HF	6AG1155-6AU02-7BN0 SIPLUS ET 200SP IM155-6PN ST	6AG1155-6MU01-7CN0 SIPLUS ET 200SP IM155-6 MF HF
General information			
Product type designation	IM 155-6 MF HF	IM 155-6 PN ST	IM 155-6 MF HF
Product function			
• I&M data	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping
• Isochronous mode	Yes	No	Yes
• IRT	Yes	Yes	Yes
• Tool changer	Yes; Docking station and docking unit		Yes; Docking station and docking unit
• Local coupling, IO data	Yes	Yes	Yes
- Number of coupling modules	6; 1x output + max. 5x input	6; 1x output + max. 5x input	6; 1x output + max. 5x input
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
• PROFINET from GSD version/GSD revision	GSDML V2.45	GSDML V2.45	GSDML V2.45
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes
Input current			
Current consumption (rated value)	550 mA	350 mA	550 mA
Address area			
Address space per station			
• Address space per station, max.	1 440 byte	1 440 byte	1 440 byte
Hardware configuration			
Rack			
• Quantity of operable ET 200SP modules, max.	64	32	64; > 60 °C ambient temperature: 48 modules
• Quantity of operable ET 200AL modules, max.		16	
Submodules			
• Number of submodules per station, max.	256	256	256
Interfaces			
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)

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Technical specifications (continued)

Article number	6AG1155-6MU01-2CN0	6AG1155-6AU02-7BN0	6AG1155-6MU01-7CN0
	SIPLUS ET 200SP IM155-6 MF HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6 MF HF
1. Interface			
Interface types			
• RJ 45 (Ethernet)	Yes; with BusAdapter	Yes; with BusAdapter	Yes; with BusAdapter
• Number of ports	2; with BusAdapter	2; with BusAdapter	2; with BusAdapter
• integrated switch	Yes	Yes	Yes
• BusAdapter (PROFINET)	Yes	Yes	Yes
Protocols			
• PROFINET IO device	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Media redundancy	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client
PROFINET IO Device			
- Services			
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 1 ms to 4 ms at an interval of 125 µs	Yes; 250 µs to 4 ms in 125 µs frame
- Dynamic Frame Packing (DFP)	Yes	Yes	Yes
- Fast Forwarding		Yes	
- Fragmentation		Yes	
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	14; 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master	4	14; 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
Interface types			
RJ 45 (Ethernet)			
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes	Yes	Yes
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
Protocols			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFIsafe	Yes	Yes	Yes
PROFIBUS	No	No	No
EtherNet/IP	Yes	No	Yes
Modbus TCP	Yes	No	Yes
Number of connections			
• Number of MtM communication relationships/connections, max.	16		16
Redundancy mode			
• PROFINET system redundancy (S2)	Yes; NAP S2	No	Yes; NAP S2
• PROFINET system redundancy (R1)	No	No	No
• H-Sync forwarding	Yes		Yes
- Media redundancy			
- MRP	Yes	Yes	Yes
- MRPD	Yes	Yes	Yes
EtherNet/IP			
- Services			
- CIP Implicit Messaging	Yes		Yes
- CIP Explicit Messaging	Yes		Yes
- CIP Safety	No		No
- Configuration control via Explicit Messaging	No		No
- Shared device	Yes; 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master		Yes; 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
- Number of scanners with shared device, max.	2		2

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Technical specifications (continued)

Article number	6AG1155-6MU01-2CN0	6AG1155-6AU02-7BN0	6AG1155-6MU01-7CN0
	SIPLUS ET 200SP IM155-6 MF HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6 MF HF
- Updating times			
- Requested Packet Interval (RPI)	2 ms		2 ms
- Address area			
- Address space per module, max.	288 byte; (246 byte outputs / 288 byte inputs)		288 byte; (246 byte outputs / 288 byte inputs)
- ForwardOpen (Class1 & 32 bit Header)	500 byte; (246 byte outputs / 500 byte inputs)		500 byte; (246 byte outputs / 500 byte inputs)
- LargeForwardOpen (Class3)	4 002 byte		4 002 byte
- Connections			
- Number of rack connections	2		2
Modbus TCP			
- Services			
- read coils (code=1)	Yes		Yes
- read discrete inputs (code=2)	Yes		Yes
- Read Holding Registers (Code=3)	Yes		Yes
- write single coil (code=5)	Yes		Yes
- write multiple coils (code=15)	Yes		Yes
- Write Multiple Registers (Code=16)	Yes		Yes
- Parameter change by master	Yes		Yes
- Modbus TCP Security Protocol	No		No
- Address space per station			
- Address space per station, max.	500 byte; (246 byte outputs / 500 byte inputs)		500 byte; (246 byte outputs / 500 byte inputs)
- Access-consistent address space	250 byte; (246 byte outputs / 250 byte inputs)		250 byte; (246 byte outputs / 250 byte inputs)
- Updating time			
- I/O request interval	2 ms		2 ms
- Connections			
- number of connections per device	9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)		9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
• ARP	Yes	Yes	Yes
• IGMP	Yes	Yes	Yes
• Multicast	Yes	Yes	Yes
• Broadcast	Yes	Yes	Yes
• IPv4	Yes	Yes	Yes
• IPv6	No	No	No
Isochronous mode			
Equidistance	Yes		Yes
shortest clock pulse	250 µs		250 µs
max. cycle	4 ms		4 ms
Bus cycle time (TDP), min.	250 µs		250 µs
Interrupts/diagnostics/status information			
Status indicator	Yes	Yes	Yes
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Diagnostics indication LED			
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED

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Technical specifications (continued)

Article number	6AG1155-6MU01-2CN0	6AG1155-6AU02-7BN0	6AG1155-6MU01-7CN0
	SIPLUS ET 200SP IM155-6 MF HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6 MF HF
• NS LED	Yes; green/red LED		Yes; green/red LED
• MS LED	Yes; green/red LED		Yes; green/red LED
• IO LED	Yes; red-green-yellow LED		Yes; red-green-yellow LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Standards, approvals, certificates			
Network loading class	3	3	3
Security			
PROFINET Security Class	1	1	1
signed firmware update	Yes	Yes	Yes
Secure Boot	No		No
safely removing data	Yes	Yes	Yes
data integrity	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG119-3-6AB00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG119-3-6AB00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG119-3-6AB00-0AA0)
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193--6AB00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193--6AB00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193--6AB00-0AA0)
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)

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Technical specifications (continued)

Article number	6AG1155-6MU01-2CN0	6AG1155-6AU02-7BN0	6AG1155-6MU01-7CN0
	SIPLUS ET 200SP IM155-6 MF HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6 MF HF
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method			
ET-Connection			
• via BU/BA Send	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules
Mechanics/material			
Strain relief	Yes; Optional	Yes; Optional	Yes; Optional
Dimensions			
Width	50 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm
Weights			
Weight, approx.	120 g; without BusAdapter	125 g; without BusAdapter	125 g; without BusAdapter

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Overview



- 4, 8 and 16-channel digital input (DI) modules
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with additional potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for nominal voltages of up to 24 V DC or 230 V AC
- PNP (sinking input) and NPN (sourcing input) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
  - Counting operating mode (multi-channel counter for pulse generators with 32-bit counting width and up to 10 kHz counting frequency)
  - Oversampling operating mode (n-fold isochronous acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Parameterizable input delay time
  - Isochronous mode (simultaneous isochronous reading of all input channels)
  - Hardware interrupts
  - Pulse stretching
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the input signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shield terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

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Overview (continued)

Overview of digital input modules

Digital input	Pkg. unit	Article No.	CC code	BU type
DI 16 x 24 V DC ST	1	6ES7131-6BH01-0BA0	CC00	A0
DI 16 x 24 V DC ST	10	6ES7131-6BH01-2BA0	CC00	A0
DI 8 x 24 V DC BA	1	6ES7131-6BF01-0AA0	CC01	A0
DI 8 x 24 V DC BA	10	6ES7131-6BF01-2AA0	CC01	A0
DI 8 x 24 V DC SRC BA	1	6ES7131-6BF61-0AA0	CC02	A0
DI 16 x 24 V DC SRC BA	1	6ES7131-6BH60-0AA0	CC00	A0
DI 8 x 24 V DC ST	1	6ES7131-6BF01-0BA0	CC01	A0
DI 8 x 24 V DC ST	10	6ES7131-6BF01-2BA0	CC01	A0
DI 8 x 24 V DC HF	1	6ES7131-6BF00-0CA0	CC01	A0
DI 8 x 24 V DC HF	10	6ES7131-6BF00-2CA0	CC01	A0
DI 8 x NAMUR HF	1	6ES7131-6TF00-0CA0	CC01	A0
DI 8 x 24 V DC HS With three operating modes: • High-speed isochronous DI • 4 pulse counters, 32-bit, 10 kHz • Oversampling	1	6ES7131-6BF00-0DA0	CC01	A0
DI 4 x 120 ... 230 V AC ST	1	6ES7131-6FD01-0BB1	CC41	B1
DI 8 x 24 V AC ... 48 V UC	1	6ES7131-6CF00-0AU0	CC20	U0

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC00 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC00 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC00 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC00 to CC05	--

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Overview (continued)

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type B1 • Forwarding of the potential group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type B1 • Forwarding of the potential group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

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Selection and ordering data

Digital input modules	
Types of delivery: Apart from the standard type of delivery in single-unit package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules. The number of modules required is the number of modules ordered. The pack type is selected by selecting the Article No. Packs of 10 can therefore only be ordered in integer multiples of 10.	
Digital input module DI 8x24VDC Basic, BU type A0, color code CC01	
• Pack of 1 unit	**6ES7131-6BF01-0AA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7131-6BF01-2AA0**
Digital input module DI 8x24VDC Source Input, Basic, BU type A0, color code CC02; Pkg. unit: 1 unit	**6ES7131-6BF61-0AA0**
Digital input module DI 16x24VDC Source Input, Basic, BU type A0, color code CC00; Pkg. unit: 1 unit	**6ES7131-6BH60-0AA0**
Digital input module DI 8x24VDC Standard, BU type A0, color code CC01	
• Pack of 1 unit	**6ES7131-6BF01-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7131-6BF01-2BA0**
Digital input module DI 16 x 24 V DC Standard, BU type A0, color code CC00	
• Pack of 1 unit	**6ES7131-6BH01-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7131-6BH01-2BA0**
Digital input module DI 8x24VDC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI); Pkg. unit: 1 unit	
• Pack of 1 unit	**6ES7131-6BF00-0CA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7131-6BF00-2CA0**
Digital input module DI 8x24VDC High Speed, BU type A0, color code CC01; 3 operating modes (fast isochronous DI, 4 pulse counters 32-bit 10 kHz, oversampling); Pkg. unit: 1 unit	**6ES7131-6BF00-0DA0**
Digital input module DI 8xNAMUR High Feature, BU type A0, color code CC01; Pkg. unit: 1 unit	**6ES7131-6TF00-0CA0**
Digital input module DI 4x120VAC-230VAC Standard, BU type B1, color code CC41; Pkg. unit: 1 unit	**6ES7131-6FD01-0BB1**
Digital input module DI 8x24VAC-48VUC Basic, BU type U0, color code CC20, module diagnostics, Pkg. unit: 1 unit	**6ES7131-6CF00-0AU0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7193-6BP00-2BA0**
BU20-P12+A0+4B	
BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the potential group; 1 unit	
• Pack of 1 unit	**6ES7193-6BP20-0BB1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7193-6BP20-2BB1**
BU20-P16+A0+2D	
BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DU0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B	
BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BU0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	**6ES7193-6BP00-2BU0**
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP2**
PotDis TB	
PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	

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Selection and ordering data (continued)

Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels for 15 mm-wide BaseUnits	
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16), 10 units	**6ES7193-6CP00-2MA0**
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16), 50 units	**6ES7193-6CP00-4MA0**
Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP01-2MA0**
Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	**6ES7193-6CP02-2MA0**
Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	**6ES7193-6CP02-4MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	**6ES7193-6CP73-4AA0**
Color-coded labels for 20 mm-wide BaseUnits	
Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	**6ES7193-6CP41-2MB0**
Color-coded labels for PotDis BU	
Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**

Selection and ordering data (continued)

Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7131-6BF01-0AA0	6ES7131-6BF61-0AA0	6ES7131-6BF01-0BA0	6ES7131-6BH01-0BA0	6ES7131-6BH60-0AA0
	ET 200SP, DI 8x 24V DC Basic, PU 1	ET 200SP, DI 8x 24V DC SRC BA	ET 200SP, DI 8x 24V DC ST, PU 1	ET 200SP, DI 16x 24V DC ST, PU 1	ET 200SP, DI 16x24VDC SRC BA
General information					
Product type designation	DI 8x24VDC BA	DI 8x24 VDC SRC BA	DI 8x24 VDC ST	DI 16x24VDC ST	DI 16x24VDC SRC BA
Product function					
• Isochronous mode	No	No	No	No	No
• suitable for operation on PROFINET R1 IMs	Yes	Yes	Yes	Yes	
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V14	V14	V14	V14	STEP 7 V19 or higher with HSP0433, integrated as of V21
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 or higher	V5.5 SP3	
• PCS 7 configurable/integrated from version			V8.1 SP1	V8.1 SP1	
• PCS neo can be configured/integrated from version			V3.1	from V1.0.0	
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.43
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	No	No	No	No	No
• Oversampling	No	No	No	No	No
• MSI	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Encoder supply					
Number of outputs	8		8		
Short-circuit protection	Yes; per module	No	Yes; per module		No
Digital inputs					
Number of digital inputs	8	8	8	16	16
Digital inputs, parameterizable	Yes	Yes	Yes	Yes	Yes
Sourcing/sinking input	P-reading	Sourcing	P-reading	P-reading	Sourcing
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes			Yes
Input characteristic curve in accordance with IEC 61131, type 2	Yes				
Input characteristic curve in accordance with IEC 61131, type 3	Yes		Yes	Yes	Yes
Number of simultaneously controllable inputs					
• Number of simultaneously controllable inputs					16
Input voltage					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	30 V to -5 V (reference potential is L+)	-30 to +5 V	-30 to +5 V	30 V to -5 V (reference potential is L+)
• for signal "1"	+11 to +30V	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V	-11 V to -30 V (reference potential is L+)
Input current					
• for signal "1", typ.	6.8 mA	6 mA	2.5 mA	2.5 mA	4 mA
Input delay (for rated value of input voltage)					
- for standard inputs					

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Technical specifications (continued)

Article number	6ES7131-6BF01-0AA0	6ES7131-6BF61-0AA0	6ES7131-6BF01-0BA0	6ES7131-6BH01-0BA0	6ES7131-6BH60-0AA0
	ET 200SP, DI 8x 24V DC Basic, PU 1	ET 200SP, DI 8x 24V DC SRC BA	ET 200SP, DI 8x 24V DC ST, PU 1	ET 200SP, DI 16x 24V DC ST, PU 1	ET 200SP, DI 16x24VDC SRC BA
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
Encoder					
Connectable encoders					
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnoses					
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
- Parameterizable	Yes	Yes	Yes	Yes	Yes
• Monitoring of encoder power supply	No	No	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No	No
• Wire break	No	No	Yes; module-wise	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No
• short-circuit	No	No	Yes; module-wise	No	No
• Short-circuit to ground					No
• Short-circuit to L+					No
• Group error	Yes			Yes	No
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C

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Technical specifications (continued)

Article number	6ES7131-6BF01-0AA0	6ES7131-6BF61-0AA0	6ES7131-6BF01-0BA0	6ES7131-6BH01-0BA0	6ES7131-6BH60-0AA0
	ET 200SP, DI 8x 24V DC Basic, PU 1	ET 200SP, DI 8x 24V DC SRC BA	ET 200SP, DI 8x 24V DC ST, PU 1	ET 200SP, DI 16x 24V DC ST, PU 1	ET 200SP, DI 16x24VDC SRC BA
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	28 g	28 g	28 g	28 g	30 g

Article number	6ES7131-6BF00-0CA0	6ES7131-6BF00-0DA0	6ES7131-6TF00-0CA0	6ES7131-6FD01-0BB1	6ES7131-6CF00-0AU0
	ET 200SP, DI 8x24VDC HF, PU 1	ET 200SP, DI 8x24VDC High Speed	ET 200SP, DI 8xNAMUR HF	ET 200SP, DI 4x 120..230V AC ST	ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
General information					
Product type designation	DI 8x24 V DC HF	DI 8x24 V DC HS	DI 8xNAMUR HF	DI 4x120...230VAC ST	DI 8x24VAC/48VUC BA
Product function					
• Isochronous mode	Yes; 250 µs	Yes; 125 µs	No	No	No
• suitable for operation on PROFINET R1 IMs	Yes	Yes	Yes	Yes	Yes
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 / -	V13 SP1	V19	V14	V15
• STEP 7 configurable/integrated from version	V5.5 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3	V5.6
• PCS 7 configurable/integrated from version	V8.1 SP1	V10.0			
• PCS neo can be configured/integrated from version	from V1.0.0	V3.1.1			
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.42	GSDML V2.3	GSDML V2.3
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	No	Yes	Yes	No	No
• Oversampling	No	Yes	No	No	No
• MSI	Yes	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V		48 V
Rated value (AC)				230 V	48 V; 24 V/48 V; 50 Hz/60 Hz
Reverse polarity protection	Yes	Yes	Yes	No	Yes
Encoder supply					
Number of outputs	8		8	4	8
Short-circuit protection	Yes		Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided	Yes; Per module, 5x 20 mm fuse, 2 A/250 V, quick-response, replaceable
NAMUR encoder supply					
• 8.2 V			Yes		
• Short-circuit protection			Yes		
• Output current per channel, max.			8 mA		
• Output current per module, max.			64 mA		

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Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
Digital inputs					
Number of digital inputs	8	8	8; NAMUR	4	8
Digital inputs, parameterizable	Yes		Yes	Yes	
Sourcing/sinking input	P-reading	P-reading	P-reading	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1					Yes
Input characteristic curve in accordance with IEC 61131, type 2					No
Input characteristic curve in accordance with IEC 61131, type 3	Yes			Yes	No
Pulse extension	Yes; Pulse duration from 4 µs	Yes	Yes; 0.5 s, 1 s, 2 s		No
• Length	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Edge evaluation	Yes; rising edge, falling edge, edge change		Yes; rising edge, falling edge, edge change		
Signal change flutter			Yes; 2 to 32 signal changes		
Flutter observation window			Yes; 0.5 s, 1 s to 100 s in 1-s steps		
Digital input functions, parameterizable					
• Gate start/stop		Yes	Yes		
• Freely usable digital input		Yes	Yes		
• Counter		Yes	Yes		
• Digital input with oversampling		Yes			
Input voltage					
• Rated value (DC)	24 V	24 V	8.2 V		
• Rated value (AC)				230 V	
• for signal "0"	-30 to +5 V	-30 to +5 V		0V AC to 40V AC	AC/DC < 10 V
• for signal "1"	+11 to +30V	+11 to +30V		74 V AC to 264 V AC	AC > 14 V, DC > 34 V
Input current					
• for signal "1", typ.	2.5 mA	6 mA		10.8 mA	3.5 mA
- for 10 k switched contact					
- for signal "0", min.			0.35 mA		
- for signal "0", max.			1.2 mA		
- for signal "1", min.			2.1 mA		
- for signal "1", max.			7 mA		
- for unswitched contact					
- for signal "0", max. (permissible quiescent current)			0.5 mA		
- for signal "1", typ.			8 mA		
- for NAMUR encoders					
- for signal "0", min.			0.35 mA		
- for signal "0", max.			1.2 mA		
- for signal "1", min.			2.1 mA		
- for signal "1", max.			7 mA		
Input delay (for rated value of input voltage)					
• tolerated changeover time for changeover contacts			300 ms		
- for standard inputs					
- Parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	No

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Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
- for interrupt inputs					
- Parameterizable		Yes			
- for technological functions					
- Parameterizable		Yes			
- for NAMUR inputs					
- at "0" to "1", max.			20 ms; See manual for details		
- at "1" to "0", max.			20 ms; See manual for details		
Encoder					
Connectable encoders					
• NAMUR encoder/changeover contact according to EN 60947			Yes		
• Single contact / changeover contact unconnected			Yes		
• Single contact / changeover contact connected with 10 kΩ			Yes		
• 2-wire sensor	Yes	Yes		Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA			
Isochronous mode					
Filtering and processing time (TCI), min.	420 µs				
Bus cycle time (TDP), min.	500 µs	125 µs			
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes		Yes
Alarms					
• Diagnostic alarm	Yes; channel by channel	Yes	Yes; channel by channel	No	Yes
• Maintenance interrupt				No	
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7	Yes	Yes; Parameterizable, channels 0 to 7	No	
Diagnoses					
• Diagnostic information readable	Yes	Yes	Yes		Yes
• Monitoring the supply voltage	Yes	Yes	Yes	No	Yes
- Parameterizable	Yes	Yes	Yes		
• Monitoring of encoder power supply	Yes; channel by channel	Yes; module-wise	No		Yes
• Wire break	Yes; Channel by channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No	Yes; channel by channel	No	
• short-circuit	Yes; channel by channel	Yes; module-wise	Yes; channel by channel	No	
• Group error					Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	No	Yes; red LED	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					

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Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS04	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS04	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	28 g	28 g	32 g	36 g	40 g

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Overview



- 4, 8 and 16-channel digital output (DQ) modules
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DQ (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting actuators with load nominal voltages of up to 120 V DC or 230 V AC and load currents of up to 5 A (depending on module)
- Relay modules
  - NO contact or changeover contact
  - for load or signal voltages (coupling relay)
  - with manual operation (as simulation module for inputs and outputs, jog mode for commissioning or emergency operation on failure of PLC)
- PNP (sourcing output) and NPN (sinking output) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSO operating mode (simultaneous reading of output data from as many as three other controllers)
  - Pulse width modulation operating mode (output value as pulse-pause ratio of between 0.0% and 100.0% for controlling the output current)
  - Oversampling operating mode (n-fold isochronous output of digital values within a PN cycle for the precise time control of an output or a sequence of output values)
  - Isochronous mode (simultaneous isochronous output of all output channels)
  - Output of substitute value in the event of communication interruptions (0, 1 or keep last value)
  - Re-parameterization during operation
  - Firmware update
  - Valve control (output signal does not switch automatically after a set pickup time to a current-saving PWM output)
  - Diagnostics of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the output signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shield terminal

A quick and clear comparison of the functions of the different DQ modules is offered by the TIA Selection Tool.

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Overview (continued)

Overview of digital output modules

Digital output	Pkg. unit	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A BA	1	6ES7132-6BH00-0AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A BA	10	6ES7132-6BH00-2AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	1	6ES7132-6BH01-0BA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	10	6ES7132-6BH01-2BA0	CC00	A0
DQ 16 x 24 V DC/0.5 A HF	1	6ES7132-6BH00-0CA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6ES7132-6BF61-0AA0	CC01	A0
DQ 16 x 24 V DC/0.5 A SNK BA	1	6ES7132-6BH60-0AA0	CC00	A0
DQ 8 x 24 V DC/0.5 A BA	1	6ES7132-6BF01-0AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A BA	10	6ES7132-6BF01-2AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	1	6ES7132-6BF01-0BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	10	6ES7132-6BF01-2BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6ES7132-6BF00-0CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	10	6ES7132-6BF00-2CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6ES7132-6BF01-0CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	10	6ES7132-6BF01-2CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6ES7132-6BD20-0BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	10	6ES7132-6BD20-2BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6ES7132-6BD21-0BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	10	6ES7132-6BD21-2BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6ES7132-6BD20-0CA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6ES7132-6BD21-0CA0	CC02	A0
DQ 4 x 24 V DC/2 A HS With three operating modes: • Fast isochronous DQ with valve control • Pulse width modulation • Oversampling	1	6ES7132-6BD20-0DA0	CC02	A0
DQ 4 x 24 ... 230 V AC/2 A ST	1	6ES7132-6FD00-0BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A ST	10	6ES7132-6FD00-2BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A HF With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control	1	6ES7132-6FD00-0CU0	CC20	U0
RQ 4 x 24 V UC/2 A CO ST	1	6ES7132-6GD51-0BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6ES7132-6HD01-0BB1	--	B0, B1
RQ 4 x 120 V DC-230 V AC/5 A NO ST	10	6ES7132-6HD01-2BB1	--	B0, B1
RQ MA 4 x 120 V DC ... 230 V AC/5 A NO ST	1	6ES7132-6MD00-0BB1	--	B0, B1

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Overview (continued)

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type B0 • Forwarding of the potential group (dark) • 12 process terminals • With 4 AUX terminals	1	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B0 • Forwarding of the potential group (dark) • 12 process terminals • With 4 AUX terminals	10	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B1 • Forwarding of the potential group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type B1 • Forwarding of the potential group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC20	--

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Overview (continued)

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC20	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC20	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC20	--

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

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Selection and ordering data

Digital output modules	
Types of delivery: Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules. The number of modules required is the number of modules ordered. The pack type is selected by selecting the Article No. Packs of 10 can therefore only be ordered in integer multiples of 10.	
Digital output module DQ 16x24VDC/0.5A Basic, BU type A0, color code CC00	
• Pack of 1 unit	**6ES7132-6BH00-0AA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7132-6BH00-2AA0**
Digital output module DQ 16x24VDC/0.5A Basic, sinking output, BU type A0, color code CC00	
• Pack of 1 unit	**6ES7132-6BH60-0AA0**
Digital output module DQ 16x24VDC/0.5A Standard, sourcing output, BU type A0, color code CC00	
• Pack of 1 unit	**6ES7132-6BH01-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7132-6BH01-2BA0**
Digital output module DQ 16x24VDC/0.5A High Feature, sourcing output, BU type A0, color code CC00	
• Pack of 1 unit	**6ES7132-6BH00-0CA0**
Digital output module DQ 8x24VDC/0.5A Sink output, Basic, BU type A0, color code CC01	
• Pack of 1 unit	**6ES7132-6BF61-0AA0**
Digital output module DQ 8x24VDC/0.5A Basic, BU type A0, color code CC02	
• Pack of 1 unit	**6ES7132-6BF01-0AA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7132-6BF01-2AA0**
Digital output module DQ 8x24VDC/0.5A Standard, BU type A0, color code CC02	
• Pack of 1 unit	**6ES7132-6BF01-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7132-6BF01-2BA0**
Digital output module DQ 8x24VDC/0.5A High Feature, BU type A0, color code CC02	
• Pack of 1 unit	**6ES7132-6BF01-0CA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7132-6BF01-2CA0**
Digital output module DQ 4x24VDC/2A Standard, BU type A0, color code CC02	
• Pack of 1 unit	**6ES7132-6BD21-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7132-6BD21-2BA0**
Digital output module DQ 4x24VDC/2A High Feature, BU type A0, color code CC02, channel-specific diagnostics, isochronous mode, shared output (MSO)	
• Pack of 1 unit	**6ES7132-6BD21-0CA0**
Digital output module DQ 4x24VDC/2A High Speed, BU type A0, color code CC02, 3 operating modes (fast isochronous DQ with valve control, pulse width modulation, oversampling)	
• Pack of 1 unit	**6ES7132-6BD20-0DA0**
Digital output module DQ 4x24VAC...230VAC/2A Standard for BU type B1, color code CC41	
• Pack of 1 unit	**6ES7132-6FD00-0BB1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7132-6FD00-2BB1**
Digital output module DQ 4x24VAC...230VAC/2A High Feature for BU type U0, color code CC20, 2 operating modes: DQ and PC (power control via phase angle, half-wave and full-wave control)	
• Pack of 1 unit	**6ES7132-6FD00-0CU0**
Signal relay module RQ CO 4x24VUC/2A Standard, changeover contact, BU type A0, color code CC00	
• Pack of 1 unit	**6ES7132-6GD51-0BA0**
Relay module RQ NO 4x120VDC-230VAC/5A Standard, NO contact, BU type B0, B1	
• Pack of 1 unit	**6ES7132-6HD01-0BB1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7132-6HD01-2BB1**
Relay module RQ NO 4x120VDC-230VAC/5A Standard, NO contact, with manual operation, BU type B0, B1	**6ES7132-6MD00-0BB1**
Relay module RQ CO 3x120V DC..230VAC/5A Standard, changeover contact, isolated, BU type U0, color code CC20	**6ES7132-6HC50-0BU0**
Relay module RQ COni 3x120V DC..230VAC/5A Standard, changeover contact, non-isolated, BU type U0, color code CC20	**6ES7132-6HC70-0BU0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**

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Selection and ordering data (continued)

BU20-P12+A4+0B	
BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP20-0BB0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BB0**
BU20-P12+A0+4B	
BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP20-0BB1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BB1**
BU20-P16+A0+2D	
BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DU0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B	
BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BU0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BU0**
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP2**
PotDis TB	
PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**

Selection and ordering data (continued)

BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC20-1AM0**
5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	
Color-coded labels for 15 mm-wide BaseUnits	
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP00-2MA0**
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP00-4MA0**
Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP01-2MA0**
Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	**6ES7193-6CP02-2MA0**
Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	**6ES7193-6CP02-4MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	**6ES7193-6CP73-4AA0**
Color-coded labels for 20 mm-wide BaseUnits	
Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	**6ES7193-6CP41-2MB0**
Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A); 10 units	**6ES7193-6CP81-2AB0**
Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units	**6ES7193-6CP82-2AB0**
Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units	**6ES7193-6CP83-2AB0**
Color-coded labels for PotDis BU	
Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**
Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**

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Selection and ordering data (continued)

Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

Technical specifications

Article number	6ES7132-6BF61--0AA0	6ES7132-6BH00--0AA0	6ES7132-6BH60--0AA0	6ES7132-6BH01--0BA0	6ES7132-6BF01--0AA0	6ES7132-6BF01--0BA0	6ES7132-6BH00--0CA0
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16X24VDC/0,5-A BA, PU 1	ET 200SP, DQ 16x24VDC/0,5-A SINK BA, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 16x24VDC/0,5-A HF, PU 1
General information							
Product type designation	DQ 8x24VDC/0,5A SNK BA	DQ 16x24VDC/0.5A BA	DQ 16x24VDC/0.5A SNK BA	DQ 16x24VDC/0.5 ST	DQ 8x24VDC/0.5A BA	DQ 8x24VDC/0.5A ST	DQ 16x24VDC/0.5A HF
Product function							
• Isochronous mode	No	No	No	No	No	No	Yes; 250 µs
Engineering with							
• STEP 7 TIA Portal configurable/integrated from version	V14	V14	STEP 7 V19 or higher with HSP0433, integrated as of V21	STEP 7 TIA V14 with HSP0222 / integrated as of TIA V15	V14	STEP 7 TIA V14 with HSP0222 / integrated as of TIA V15	STEP 7 V18 or higher with HSP 0416
• STEP 7 configurable/integrated from version	V5.5 SP3	STEP 7 V5.5 or higher		V5.5 SP3 with HSP0230 V7.0 / integrated as of V5.6 SP1	V5.5 SP3	V5.5 SP3 with HSP0230 V7.0 / integrated as of V5.6 SP1	V5.5 SP3 or higher
• PCS 7 configurable/integrated from version				V8.1 SP1		V8.1 SP1	
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.43	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.43
Operating mode							
• DQ	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No	No	No	No
• PWM	No	No	No	No	No	No	No
• Cam control (switching at comparison values)							No
• Oversampling	No	No	No	No	No	No	No
• MSO	No	No	No	No	No	No	Yes
Supply voltage							
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection		Yes	Yes	Yes	Yes	Yes	Yes
Digital outputs							
Type of digital output	Sink output (NPN)	Source output (PNP, current-sourcing)	Sink output (NPN)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)
Number of digital outputs	8	16	16	16	8	8	16
Current-sinking	Yes	No	Yes	No	No	No	No
Current-sourcing	No	Yes	No	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	Yes	Yes	Yes
output type acc. to IEC 61131, type 0.5			Yes	Yes		Yes	Yes
Short-circuit protection	Yes	Yes	Yes; Electronic	Yes; Electronic	Yes; per channel, electronic	Yes; Electronic	Yes; Electronic
Open-circuit detection		No		Yes		Yes	Yes
Limitation of inductive shutdown voltage to	Typ. 47 V	Typ. L+ (-53 V)	Typ. 39 V	Typ. L+ (-50 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Switching capacity of the outputs							

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Technical specifications (continued)

Article number	6ES7132-6BF61--0AA0	6ES7132-6BH00--0AA0	6ES7132-6BH60--0AA0	6ES7132-6BH01--0BA0	6ES7132-6BF01--0AA0	6ES7132-6BF01--0BA0	6ES7132-6BH00--0CA0
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16X24VDC/0,5-A BA, PU 1	ET 200SP, DQ 16x24VDC/0,5-A SINK BA, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 16x24VDC/0,5-A HF, PU 1
• with resistive load, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• with inductive load, max.			0.5 A; see additional description in the Equipment Manual	0.5 A		0.5 A	0.5 A
• on lamp load, max.	5 W	5 W	2.5 W	5 W	5 W	5 W	5 W
Load resistance range							
• lower limit	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω
• upper limit	3 400 Ω	100 kΩ	12 kΩ	12 kΩ	100 kΩ	12 kΩ	12 kΩ
Output current							
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	5 µA	30 µA	5 µA	0.1 mA	10 µA	0.1 mA	0.1 mA
Output delay with resistive load							
• "0" to "1", typ.		80 µs; at rated load	100 µs	50 µs			50 µs
• "0" to "1", max.	300 µs	150 µs; at rated load			100 µs; at rated load	50 µs; at rated load	
• "1" to "0", typ.		100 µs; at rated load	300 µs	100 µs			100 µs
• "1" to "0", max.	600 µs	200 µs; at rated load			150 µs; at rated load	100 µs; at rated load	
Parallel switching of two outputs							
• for uprating	No	No	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Switching frequency							
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	2 Hz		0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	2 Hz	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"
• with inductive load (acc. to IEC 60947-5-1, DC13), max.			0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"				
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
Total current of the outputs							
• Current per channel, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• Current per module, max.	4 A	8 A	8 A; see Equipment Manual "Derating curve"	8 A; see Equipment Manual "Derating curve"	4 A	4 A	8 A
Total current of the outputs (per module)							
- horizontal installation							
- up to 40 °C, max.			8 A	8 A			8 A
- up to 50 °C, max.			6 A	6 A			6 A
- up to 60 °C, max.	4 A	8 A	4 A	4 A	4 A	4 A	4 A
- vertical installation							
- up to 30 °C, max.			8 A	8 A			8 A
- up to 40 °C, max.			6 A	6 A			6 A
- up to 50 °C, max.	4 A	8 A	4 A	4 A	4 A	4 A	4 A
Isochronous mode							
Execution and activation time (TCO), min.							48 µs
Bus cycle time (TDP), min.							500 µs
Interrupts/diagnostics/status information							
Diagnostics function	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7132-6BF61--0AA0	6ES7132-6BH00--0AA0	6ES7132-6BH60--0AA0	6ES7132-6BH01--0BA0	6ES7132-6BF01--0AA0	6ES7132-6BF01--0BA0	6ES7132-6BH00--0CA0
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16X24VDC/0,5-A BA, PU 1	ET 200SP, DQ 16x24VDC/0,5-A SINK BA, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 16x24VDC/0,5-A HF, PU 1
Alarms							
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnoses							
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Wire break	No	No	No	Yes; module-wise	No	Yes; module-wise	Yes; channel by channel
• short-circuit	No	No	No		No		
• Short-circuit to ground				Yes; module-wise		Yes; module-wise	Yes; channel by channel
• Short-circuit to L+				Yes; module-wise		Yes; module-wise	Yes; channel by channel
• Group error	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED							
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green PWR LED	Yes; green LED
• for channel diagnostics	No	No	No	No	No	No	Yes; green LED, see Alarms/diagnostics
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green PWR LED	Yes; green/red DIAG LED
Potential separation							
Potential separation channels							
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates							
Suitable for safety functions	No	No	No	No	No	No	No
Suitable for safety-related tripping of standard modules		No	No	No	Yes; see FAQ Entry ID: 39198632	No	Yes; see FAQ Entry ID: 39198632
Highest safety class achievable in safety mode							
• Performance level according to ISO 13849-1					PL d		
• SIL acc. to IEC 61508					SIL 2		
Highest safety class achievable for safety-related tripping of standard modules							
• Performance level according to ISO 13849-1							PL d
• Category according to ISO 13849-1							Cat. 3
• SIL acc. to IEC 62061							SIL 2
Ambient conditions							
Ambient temperature during operation							
• horizontal installation, min.	-25 °C	-30 °C	-30 °C	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-25 °C	-30 °C	-30 °C	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level							
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions							
Width	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm	58 mm	58 mm
Weights							
Weight, approx.	30 g	30 g	30 g	30 g	30 g	30 g	26 g

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Technical specifications (continued)

Article number	6ES7132-6BF01-0CA0	6ES7132-6BD21-0BA0	6ES7132-6BD21-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	ET 200SP, DQ 4X24VDC/2A ST, PU 1	ET 200SP, DQ 4x24VDC/2A HF, PU 1	ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	ET 200SP, DQ 4x24..230VAC/2A ST
General information					
Product type designation	DQ 8x24VDC/0.5A HF	DQ 4x24VDC/2A ST	DQ 4x24VDC/2A HF	DQ 4x24 V DC/2 A HS	DQ 4x24 ... 230 V AC/2 A ST
Product function					
• Isochronous mode	Yes; 250 µs	No	Yes; 250 µs	Yes; Operating modes DQ and OVS only	No
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	as of TIA Portal V19 with HSP0428 / integrated as of TIA Portal V20	STEP 7 V19 or higher with HSP0425 / integrated as of TIA Portal V20	as of TIA Portal V19 with HSP0426 / integrated as of TIA Portal V20	STEP 7 V15.1 or higher	V13 / V13
• STEP 7 configurable/integrated from version	as of STEP 7 V5.5 SP3 with HSP0230 V11.0 / integrated as of STEP 7 V5.7 SP3	as of STEP 7 V5.5 SP3 with HSP0230 V11.0 / integrated as of STEP 7 V5.7 SP3	as of STEP 7 V5.5 SP3 with HSP0230 V11.0 / integrated as of STEP 7 V5.7 SP3	via GSD as of V5.6 HF4	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.43	GSDML V2.43	GSDML V2.43	GSDML V2.33	GSDML V2.3
Operating mode					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	Yes; Valve control	No
• PWM	No	No	No	Yes	No
• Cam control (switching at comparison values)				Yes; Via MtM (module-to-module communication)	
• Oversampling	No	No	No	Yes	No
• MSO	Yes	No	Yes	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	
Rated value (AC)					230 V
Reverse polarity protection	Yes	Yes	Yes	Yes	
Digital outputs					
Type of digital output	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Triac with zero point detection
Number of digital outputs	8	4	4	4	4
Current-sinking	No	No	No	No	No
Current-sourcing	Yes	Yes	Yes	Yes; Push-pull output	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	No
output type acc. to IEC 61131, type 0.5	Yes				
output type acc. to IEC 61131, type 2		Yes	Yes		
Short-circuit protection	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes	No; When using BU type B1, a miniature, quick-response fuse with 10 A tripping current must be provided
Open-circuit detection	Yes	Yes	Yes		
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)	M (-1 V)	
Controlling a digital input	Yes	Yes; supports input type 3 according to IEC 61131-2	Yes	No	Yes
Size of motor starters according to NEMA, max.					5
Digital output functions, parameterizable					
• Switching tripped by comparison values				Yes	

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Technical specifications (continued)

Article number	6ES7132-6BF01-0CA0 ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	6ES7132-6BD21-0BA0 ET 200SP, DQ 4X24VDC/2A ST, PU 1	6ES7132-6BD21-0CA0 ET 200SP, DQ 4x24VDC/2A HF, PU 1	6ES7132-6BD20-0DA0 ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4x24..230VAC/2A ST
- Number of cam tracks, max.				4	
• Freely usable digital output				Yes	
• PWM output				Yes	
- Number, max.				4	
• Digital output with oversampling				Yes	
- Number, max.				4	
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	2 A	2 A	2 A	2 A
• with inductive load, max.	0.5 A	2 A	2 A		
• on lamp load, max.	5 W	10 W	10 W	10 W	100 W
Load resistance range					
• lower limit	48 Ω	12 Ω	12 Ω	12 Ω	
• upper limit	12 kΩ	3 400 Ω	3 400 Ω	3 400 Ω	
Output voltage					
• for signal "1", min.					20.4 V
Output current					
• for signal "1" rated value	0.5 A	2 A	2 A	2 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA	0.1 mA	0.1 mA	460 µA
Output delay with resistive load					
• "0" to "1", typ.	50 µs	50 µs	50 µs		
• "0" to "1", max.				1 µs	10 ms
• "1" to "0", typ.	100 µs	100 µs	100 µs		
• "1" to "0", max.				1 µs	10 ms
Parallel switching of two outputs					
• for logic links					No
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes		Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	5 kHz	10 Hz
• with inductive load, max.	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	5 kHz	0.5 Hz; Higher frequencies are possible, see Equipment Manual / Product Information
• on lamp load, max.	10 Hz	10 Hz	10 Hz	5 kHz	1 Hz
Total current of the outputs					
• Current per channel, max.	0.5 A	2 A	2 A	2 A	2 A
• Current per module, max.	4 A	8 A; see Equipment Manual "Derating curve"	8 A; see Equipment Manual "Derating curve"	8 A	8 A
Total current of the outputs (per module)					
- horizontal installation					
- up to 30 °C, max.		8 A	8 A	8 A; DQ mode	
- up to 40 °C, max.		8 A	8 A	6.9 A; DQ mode	8 A
- up to 50 °C, max.		6 A	6 A	4.7 A; DQ mode	6 A
- up to 60 °C, max.	4 A	4 A	4 A	2.5 A; DQ mode	4 A
- vertical installation					
- up to 30 °C, max.		8 A	8 A	7.2 A; DQ mode	8 A
- up to 40 °C, max.		6 A	6 A	5.6 A; DQ mode	6 A
- up to 50 °C, max.	4 A	4 A	4 A	4 A; DQ mode	4 A

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Technical specifications (continued)

Article number	6ES7132-6BF01-0CA0 ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	6ES7132-6BD21-0BA0 ET 200SP, DQ 4X24VDC/2A ST, PU 1	6ES7132-6BD21-0CA0 ET 200SP, DQ 4x24VDC/2A HF, PU 1	6ES7132-6BD20-0DA0 ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4x24..230VAC/2A ST
Isochronous mode					
Execution and activation time (TCO), min.	48 µs		75 µs	40 µs	
Bus cycle time (TDP), min.	500 µs		500 µs	125 µs	
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	No
Diagnoses					
• Diagnostic information readable				Yes	
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	No
- Parameterizable	Yes	Yes	Yes		
• Wire break	Yes; channel by channel	Yes; module-wise	Yes; channel by channel	No	No
• short-circuit				Yes; module-wise	No
• Short-circuit to ground	Yes; channel by channel	Yes; module-wise	Yes; channel by channel		
• Short-circuit to L+	Yes; channel by channel	Yes; module-wise	Yes; channel by channel		
• Group error	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	No	Yes; red LED	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; see FAQ Entry ID: 39198632		Yes; see FAQ Entry ID: 39198632	No	
Highest safety class achievable for safety-related tripping of standard modules					
• Performance level according to ISO 13849-1	PL d		PL d		
• Category according to ISO 13849-1	Cat. 3		Cat. 3		
• SIL acc. to IEC 62061	SIL 2		SIL 2		
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	60 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m; On request: Installation altitudes greater than 2 000 m

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Technical specifications (continued)

Article number	6ES7132-6BF01-0CA0	6ES7132-6BD21-0BA0	6ES7132-6BD21-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	ET 200SP, DQ 4X24VDC/2A ST, PU 1	ET 200SP, DQ 4x24VDC/2A HF, PU 1	ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	ET 200SP, DQ 4x24..230VAC/2A ST
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	30 g	30 g	30 g	31 g	50 g

Article number	6ES7132-6FD00-0CU0	6ES7132-6GD51-0BA0	6ES7132-6HD01-0BB1	6ES7132-6MD00-0BB1
	ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	ET 200SP, RQ CO 4x 24V DC/2A ST, VPE 1	ET 200SP, RQ NO 4x 120VDC..230VAC/5A, PU1	ET 200SP,RQ NO-mA 4x120VDC..230VAC/5A ST
General information				
Product type designation	DQ 4x24 ... 230 V AC/2 A HF	RQ CO 4x24VDC/2A ST	RQ 4x120 VDC ... 230 VAC/5 A NO ST	RQ 4x120 V DC ... 230 V AC/5 A NO MA ST
Product function				
• Isochronous mode	No	No	No	No
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	V14	V14	V14	V13 SP1
• STEP 7 configurable/integrated from version	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3 / -
• PCS 7 configurable/integrated from version			V8.1 SP1	
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	Yes	No	No	No
• PWM	No	No	No	No
• Oversampling	No	No	No	No
• MSO	No	No	No	No
• Phase control	Yes; Control area: 8.5 ... 100% of the phase angle			
• Trailing-edge phase	No			
• Half-wave	Yes			
• Full-wave	Yes			
Supply voltage				
Rated value (DC)		24 V	24 V	24 V
Rated value (AC)	230 V; 47 ... 63 Hz, max. rate of change of frequency 1 mHz/s			
Reverse polarity protection		Yes	Yes	Yes
Digital outputs				
Type of digital output	Triac	Relays	Relays	Relays
Number of digital outputs	4	4	4	4
Current-sinking	No	Yes	Yes	Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	No; external fusing necessary	No	No	No
Open-circuit detection	Yes; channel by channel			
Overload protection	No; A miniature fuse with 10 tripping current and tripping characteristic "quick response" must be provided in the module supply			
Controlling a digital input	Yes			

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Technical specifications (continued)

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, VPE 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC..230VAC/5A, PU1	6ES7132-6MD00-0BB1 ET 200SP,RQ NO-mA 4x120VDC..230VAC/5A ST
Switching capacity of the outputs				
• with resistive load, max.	2 A; Max. 4 A, see additional description in manual			
• with inductive load, max.	2 A			
• on lamp load, max.	100 W; Tungsten rating in accordance with UL; for thermistors with higher power ratings, see the notes in the manual			
Output voltage				
• for signal "1", min.	20.4 V			
Output current				
• for signal "1" rated value	2 A			
• for signal "0" residual current, max.	3 mA			
Output delay with resistive load				
• "0" to "1", max.	40 ms; 2 AC cycles			
• "1" to "0", max.	20 ms; 1 AC cycle			
Parallel switching of two outputs				
• for logic links	No	Yes	Yes	
• for uprating	No	No	No	
• for redundant control of a load	Yes	Yes	Yes	
Switching frequency				
• with resistive load, max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode	2 Hz	2 Hz	2 Hz
• with inductive load (acc. to IEC 60947-5-1, DC13), max.			0.5 Hz; provide one freewheeling diode for switching frequencies higher than 0.1 Hz	0.5 Hz; provide one freewheeling diode for switching frequencies higher than 0.1 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode		0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz; Applies to DQ mode; limited by line frequency in PC mode		2 Hz	2 Hz
Total current of the outputs				
• Current per channel, max.	2 A; Max. 4 A, see additional description in manual	2 A	5 A	5 A
• Current per module, max.	8 A	8 A	20 A	20 A
Total current of the outputs (per module)				
- horizontal installation				
- up to 40 °C, max.	8 A	8 A		
- up to 50 °C, max.	6 A	6 A	20 A	20 A
- up to 60 °C, max.	4 A	4 A	16 A	16 A
- vertical installation				
- up to 30 °C, max.	8 A	8 A		
- up to 40 °C, max.	6 A	6 A	20 A	20 A
- up to 50 °C, max.	4 A	4 A	16 A	16 A
Relay outputs				
• Number of relay outputs		4	4	4
• Rated supply voltage of relay coil L+ (DC)		24 V	24 V	24 V
• Current consumption of relays (coil current of all relays), max.		40 mA	40 mA	40 mA
• external protection for relay outputs			Yes, with miniature fuse max. 6 A tripping current and quick-response tripping characteristic	Yes, with miniature fuse max. 6 A tripping current and quick-response tripping characteristic
• Number of operating cycles, max.		500 000	7 000 000; see additional description in the manual	7 000 000; see additional description in the manual

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Technical specifications (continued)

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, VPE 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC..230VAC/5A, PU1	6ES7132-6MD00-0BB1 ET 200SP,RQ NO-mA 4x120VDC..230VAC/5A ST
- Switching capacity of contacts				
- with inductive load, max.			2 A; see additional description in the manual	2 A; see additional description in the manual
- with resistive load, max.		2 A	5 A; see additional description in the manual	5 A; see additional description in the manual
- Thermal continuous current, max.		2 A	5 A; Max. 1 385 VA, 150 W	5 A
- Switching current, min.		1 mA; 5 V DC	100 mA; 5 V DC	100 mA; 5 V DC
- Rated switching voltage (DC)		24 V	24 V DC to 120 V DC	24 V DC to 120 V DC
- Rated switching voltage (AC)		24 V	24V AC to 230V AC	24V AC to 230V AC
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnoses				
• Diagnostic information readable	Yes			
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire break	Yes; channel by channel	No	No	No
• short-circuit	No	No	No	No
• Group error	Yes			Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red Fn LED	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions				
Width	20 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	50 g	30 g	40 g	45 g

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Technical specifications (continued)

Article number	6ES7132-6HC50-0BU0 ET 200SP, RQ CO 3x120VDC.230VAC/5A ST	6ES7132-6HC70-0BU0 ET 200SP, RQ COni 3x120VDC.230VAC/5A ST
General information		
Product type designation	RQ 3x120VDC-230VAC/5A CO ST	RQ 3x120VDC-230VAC/5A CO n.i. ST
Product function		
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher	TIA V19 or higher with HSP0463 / integrated as of TIA V20
• STEP 7 configurable/integrated from version	Configurable via GSD file	
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.34	GSDML V2.45
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Digital outputs		
Type of digital output	Relays	Relays
Number of digital outputs	3	3
Current-sinking	Yes	Yes
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	No	No
Switching capacity of the outputs		
• with resistive load, max.	5 A; for an additional description, see the Technical Data in the Equipment Manual	5 A; for an additional description, see the Technical Data in the Equipment Manual
• with inductive load, max.	2 A; for an additional description, see the Technical Data in the Equipment Manual	2 A; for an additional description, see the Technical Data in the Equipment Manual
Parallel switching of two outputs		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	2 Hz	2 Hz
Total current of the outputs		
• Current per channel, max.	5 A	5 A
• Current per module, max.	15 A	5 A
Total current of the outputs (per module)		
- horizontal installation		
- up to 50 °C, max.	15 A	5 A
- up to 60 °C, max.	12 A; maximum channel current 4A	5 A
- vertical installation		
- up to 40 °C, max.	15 A	5 A
- up to 50 °C, max.	12 A; maximum channel current 4A	5 A
Relay outputs		
• Number of relay outputs	3; changeover contact, isolated	3; Changeover contact, non-floating
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V
• Current consumption of relays (coil current of all relays), max.	30 mA	40 mA
• external protection for relay outputs	yes, with miniature fuse max. 6.3 A tripping current, quick-response tripping characteristic and 1 500 A breaking capacity	yes, with miniature fuse max. 6.3 A tripping current, quick-response tripping characteristic and 1 500 A breaking capacity
• Number of operating cycles, max.	1 000 000; see additional description in the manual	1 000 000; see additional description in the manual
- Switching capacity of contacts		
- with inductive load, max.	2 A; see additional description in the manual	2 A; see additional description in the manual
- with resistive load, max.	5 A; see additional description in the manual	5 A; see additional description in the manual
- Thermal continuous current, max.	5 A; Max. 1 385 VA, 150 W	5 A; Max. 1 385 VA, 150 W

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Technical specifications (continued)

Article number	6ES7132-6HC50-0BU0 ET 200SP, RQ CO 3x120VDC.230VAC/5A ST	6ES7132-6HC70-0BU0 ET 200SP, RQ COni 3x120VDC.230VAC/5A ST
- Switching current, min.	10 mA; 5 V DC	10 mA; 5 V DC
- Rated switching voltage (DC)	24 V DC to 120 V DC	24 V DC to 120 V DC
- Rated switching voltage (AC)	24V AC to 230V AC	24V AC to 230V AC
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	No	No
• short-circuit	No	No
Diagnostics indication LED		
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	40 g	40 g

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Overview



- Digital hybrid module with 8 digital inputs and 8 digital outputs

For different requirements, the digital input/output modules offer

- Function class standard
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting sensors compliant with IEC 61131 type 1 and 3 (module-dependent) for nominal voltages of up to 24 V DC
- PNP (sinking input) variants
- PNP (sourcing output) variants
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - Output of substitute value in the event of communication interruptions (0, 1 or keep last value)
  - Hardware interrupts
  - Pulse stretching
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the output signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shield terminal

A quick and clear comparison of the functions of the different DI/DQ modules is offered by the TIA Selection Tool

Overview of digital input/output modules

Digital input/output modules	Pkg. unit	Article No.	CC code	BU type
DI 8x/DQ 8x24VDC/0.5A ST	1	6ES7133-6BH00-0BA0	CC00	A0

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Overview (continued)

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13

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Overview (continued)

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

Selection and ordering data

Digital input/output modules	
Digital input/output module DI 8x/DQ 8x24VDC/0.5A ST, BU type A0, color code CC00	
• Pack of 1 unit	**6ES7133-6BH00-0BA0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP2**
PotDis TB	
PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**

Selection and ordering data (continued)

PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels for 15 mm-wide BaseUnits	
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP00-2MA0**
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP00-4MA0**
Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP01-2MA0**
Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	**6ES7193-6CP02-2MA0**
Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	**6ES7193-6CP02-4MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	**6ES7193-6CP73-4AA0**

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Selection and ordering data (continued)

Color-coded labels for 20 mm-wide BaseUnits	
Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	**6ES7193-6CP41-2MB0**
Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A); 10 units	**6ES7193-6CP81-2AB0**
Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units	**6ES7193-6CP82-2AB0**
Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units	**6ES7193-6CP83-2AB0**
Color-coded labels for PotDis BU	
Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**
Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**
Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**

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Technical specifications

Article number	6ES7133-6BH00-0BA0 ET 200SP, DI8x+DQ8x 24V DC/0,5A ST, PU1
General information	
Product type designation	DI 8x/DQ 8x24VDC/0,5A ST
Product function	
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher with HSP 0401
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.42
Operating mode	
• DI	Yes
• DQ	Yes
• DQ with energy-saving function	No
• PWM	No
• Oversampling	No
• MSO	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	8
Digital inputs, parameterizable	Yes
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Type of digital output	Source output (PNP, current-sourcing)
Number of digital outputs	8
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
output type acc. to IEC 61131, type 0.5	Yes
Short-circuit protection	Yes; Electronic
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• with inductive load, max.	0.5 A; max. 1 H inductance
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	

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Technical specifications (continued)

Article number	6ES7133-6BH00-0BA0 ET 200SP, DI8x+DQ8x 24V DC/0,5A ST, PU1
• "0" to "1", max.	50 µs
• "1" to "0", max.	100 µs
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	0.5 A
• Current per module, max.	4 A
Total current of the outputs (per module)	
- horizontal installation	
- up to 60 °C, max.	4 A
- vertical installation	
- up to 50 °C, max.	4 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes; module-by-module, for DI: optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm
• Short-circuit to ground	Yes; module-by-module for DQ
• Short-circuit to L+	Yes; module-by-module for DQ
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm

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Technical specifications (continued)

Article number	6ES7133-6BH00-0BA0 ET 200SP, DI8x+DQ8x 24V DC/0,5A ST, PU1
Weights	
Weight, approx.	30 g

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Overview



Energy Meter HF module for SIMATIC ET 200SP video



- 2, 4 and 8-channel analog input (AI) modules
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the analog input modules offer:

- Function classes Basic, Standard, High Feature and High Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting current, voltage and resistance sensors, as well as thermocouples
- Option of connecting force and torque sensors
- Energy Meter for recording up to 600 electrical variables
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
  - Oversampling operating mode (n-fold isochronous acquisition of analog values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Isochronous mode (simultaneous equidistant reading in of all analog values)
  - Scalable measuring range (adaptation of measuring range, increase of the 16-bit resolution by adapting the measuring range to a limited section)
  - Scaling of the measured values (transmission of the analog value normalized to the required physical value as a 32-bit floating point value)
  - Internal compensation of the line resistance for thermocouples by means of terminal temperature measurement in the BaseUnit for BU type A1
  - Internal compensation also for 2-wire resistance test by means of adjustable line resistance
  - Calibration during runtime
  - Single-channel galvanic isolation
  - HART communication
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break, short-circuit, overflow, underflow
  - Two upper and lower hardware interrupts in each case, interference frequency suppression, smoothing
  - Value status (optional binary validity information of the analog value in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shield terminal

A quick and clear comparison of the functions of the AI modules is offered by the TIA Selection Tool.

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Overview (continued)

Overview of analog input modules

Analog input	Pkg. unit	Article No.	CC code	BU type
AI 8 x I 2/4-wire BA	1	6ES7134-6GF00-0AA1	CC01	A0, A1
AI 2 x U ST	1	6ES7134-6FB00-0BA1	CC00	A0, A1
AI 8 x U BA	1	6ES7134-6FF00-0AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6ES7134-6HD00-0BA1	CC03	A0, A1
AI 4 x U/I 2-wire ST	10	6ES7134-6HD00-2BA1	CC03	A0, A1
AI 2 x I 2/4-wire ST	1	6ES7134-6GB00-0BA1	CC05	A0, A1
AI 4 x I 2/4-wire ST	1	6ES7134-6GD00-0BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	10	6ES7134-6GD00-2BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6ES7134-6TD00-0CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6ES7134-6HB00-0CA1	CC05	A0, A1
AI 2 x U/I 2/4-wire HS With two operating modes: • High-speed isochronous AI • Oversampling	1	6ES7134-6HB00-0DA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	1	6ES7134-6JF00-0CA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	10	6ES7134-6JF00-2CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	1	6ES7134-6JD00-0CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	10	6ES7134-6JD00-2CA1	CC00	A0, A1
AI 4 x TC High Speed	1	6ES7134-6JD00-0DA1	CC00	A0, A1
AI 2 x SG 4/6-wire High Speed	1	7MH4134-6LB00-0DA0	CC00	A0
AI Energy Meter CT ST	1	6ES7134-6PA01-0BU0	--	U0
AI Energy Meter RC ST	1	6ES7134-6PA21-0BU0	--	U0
AI Energy Meter CT HF	1	6ES7134-6PA01-0CU0	--	U0
AI Energy Meter RC HF	1	6ES7134-6PA21-0CU0	--	U0

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--

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Overview (continued)

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New potential group (light) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New potential group (light) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of the potential group (dark) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
BU type A1 • Forwarding of the potential group (dark) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

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Overview (continued)

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

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Selection and ordering data

Analog input modules	
Types of delivery: Apart from the standard type of delivery in a single-unit package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules. The number of modules required is the number of modules ordered. The pack type is selected by selecting the Article No. Packs of 10 can therefore only be ordered in integer multiples of 10.	
Analog input module AI 8xI 2/4-wire BA, BU type A0 or A1, color code CC01	**6ES7 134-6GF00-0AA1**
Analog input module AI 2xU ST, BU type A0 or A1, color code CC00	**6ES7134-6FB00-0BA1**
Analog input module AI 8xU BA, BU type A0 or A1, color code CC02	**6ES7 134-6FF00-0AA1**
Analog input module AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%	
• Pack of 1 unit	**6ES7134-6HD01-0BA1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7134-6HD01-2BA1**
Analog input module AI 2xI 2/4-wire Standard, BU type A0 or A1, color code CC05, 16-bit	
• Pack of 1 unit	**6ES7134-6GB00-0BA1**
Analog input module AI 4xI 2/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%	
• Pack of 1 unit	**6ES7134-6GD01-0BA1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7134-6GD01-2BA1**
Analog input module AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03	**6ES7134-6TD00-0CA1**
Analog input module AI 2xU/I 2/4-wire High Feature, BU type A0 or A1, color code CC05, 16-bit, ±0.1%, independent channel galvanic isolation, isochronous mode above 1 ms	**6ES7134-6HB00-0CA1**
Analog input module AI 2xU/I 2/4-wire High Speed, BU type A0 or A1, color code CC00, 16-bit, ±0.3%, isochronous mode above 250 µs, oversampling above 50 µs	**6ES7134-6HB00-0DA1**
Analog input module AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range	
• Pack of 1 unit	**6ES7134-6JF00-0CA1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7134-6JF00-2CA1**
Analog input module AI 4xRTD/TC 2/3/4-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range	
• Pack of 1 unit	**6ES7134-6JD00-0CA1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7134-6JD00-2CA1**
Analog input module AI 4xTC High Speed, BU type A0 or A1, color code CC00, 16-bit, channel diagnostics	**6ES7134-6JD00-0DA1**
Analog input module AI 2x SG, 4/6-wire High Speed, BU type A0, color code CC00, channel diagnostics, 28/16-bit, ±0.05%, for DMS full bridges; for connecting force and torque sensors	**7MH4134-6LB00-0DA0**
Analog input module AI Energy Meter CT ST, BU type U0	**6ES7134-6PA01-0BU0**
Analog input module AI Energy Meter RC ST, BU type U0	**6ES7134-6PA21-0BU0**
Analog input module AI Energy Meter CT HF, for 1 A or 5 A current transformers, with line analysis functions, channel diagnostics; BU type U0	**6ES7134-6PA01-0CU0**
Analog input module AI Energy Meter RC HF, for Rogowski coils or 333 mV current/voltage transformers, with line analysis functions, channel diagnostics; BU type U0	**6ES7134-6PA21-0CU0**
Suitable type A0 BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Suitable type A1 BaseUnits (temperature detection)	
BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new potential group (max. 10 A)	**6ES7193-6BP40-0DA1**
BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	**6ES7193-6BP00-0DA1**
BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the potential group	**6ES7193-6BP40-0BA1**
BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	**6ES7193-6BP00-0BA1**
Suitable type U0 BaseUnits	

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Selection and ordering data (continued)

BU20-P16+A0+2D	
BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DU0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B	
BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BU0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BU0**
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP2**
PotDis TB	
PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC20-1AM0**
5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	
Color-coded labels	
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP00-2MA0**
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP00-4MA0**

Selection and ordering data (continued)

Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP01-2MA0**
Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	**6ES7193-6CP02-2MA0**
Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	**6ES7193-6CP02-4MA0**
Color code CC03, for 16 process terminals, BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16); 10 units	**6ES7193-6CP03-2MA0**
Color code CC05, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16); 10 units	**6ES7193-6CP05-2MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	**6ES7193-6CP74-2AA0**
Color-coded labels for PotDis BU	
Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**
Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**
Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8XI 2-/4-Wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
General information					
Product type designation	AI 8xI 2-/4-wire BA	AI 2xU ST	AI 8xU BA	AI 4x U/I 2-wire	AI 2xI 2-/4-wire ST
Product function					
• Isochronous mode	No	No	No	No	No
• Measuring range scalable	No	No	No	No	No
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	TIA Portal V21	V13 SP1	TIA Portal V21	V14 / -	V13 SP1
• STEP 7 configurable/integrated from version	V5.7 SP3	V5.5 SP3 / -	V5.7 SP3	V5.6 and higher	V5.5 SP3
• PCS 7 configurable/integrated from version				V8.1 SP1	
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.45	GSDML V2.3	GSDML V2.45	GSDML V2.3	V2.3 / -
Operating mode					
• Oversampling	No	No	No	No	No
• MSI	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Analog inputs					
Number of analog inputs	8; Single-ended	2	8; Single-ended	4; Differential inputs	2
• For current measurement	8				2
• For voltage measurement		2	8		
permissible input voltage for voltage input (destruction limit), max.		30 V	30 V	30 V	
permissible input current for current input (destruction limit), max.	50 mA			50 mA	50 mA
Cycle time (all channels), min.	1 ms; per channel	500 µs	1 ms; per channel	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	500 µs
Input ranges (rated values), voltages					
• 0 to +10 V		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	
• 1 V to 5 V		Yes; 15 bit		Yes; 15 bit	
• -10 V to +10 V		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• -5 V to +5 V		Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
Input ranges (rated values), currents					
• 0 to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes				Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
Cable length					
• shielded, max.	200 m	200 m	200 m	1 000 m; 200 m for voltage measurement	1 000 m
Analog value generation for the inputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8XI 2-/4-Wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
• Interference voltage suppression for interference frequency f1 in Hz	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz / off	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 250 µs without filter	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 500 µs without filter
Smoothing of measured values					
• Number of smoothing levels	4	4	4	4; None; 4/8/16 times	4
• Parameterizable	Yes	Yes	Yes	Yes	Yes
Encoder					
Connection of signal encoders					
• for voltage measurement	No	Yes	Yes	Yes	
• for current measurement as 2-wire transducer	Yes			Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω			650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes		No	No	Yes
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)		0.3 %	0.3 %	0.3 %	
• Current, relative to input range, (+/-)	0.3 %			0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency					
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB
• Common mode voltage, max.		10 V		10 V	10 V
• Common mode interference, min.		90 dB		90 dB	90 dB
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	No	No	No	No	No
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire break	Yes; at 4 to 20 mA	No	No	Yes; at 4 to 20 mA	Yes; at 4 to 20 mA
• short-circuit	Yes; Sensor supply to M; module by module	Yes; at 1 to 5 V	No	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Short-circuit of the encoder supply
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/Underflow	Yes; module-wise	Yes; module-wise	Yes; module-wise	Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8XI 2-/4-Wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
Standards, approvals, certificates					
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262	
Suitable for applications according to CQI-9				Yes	
Security					
signed firmware update	Yes; firmware V2.0.0 or higher		Yes; firmware V2.0.0 or higher		
safely removing data	Yes; firmware V2.0.0 or higher		Yes; firmware V2.0.0 or higher		
data integrity	Yes; firmware V2.0.0 or higher		Yes; firmware V2.0.0 or higher		
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS04
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS04
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	32 g

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2-/4-Wire ST, PU 1	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
General information			
Product type designation	AI 4xI 2-/4-wire ST	AI 2xU/I 2-/4-wire HF	AI 2xU/I 2-/4-wire HS
Product function			
• Isochronous mode	No	Yes; 250 µs	Yes; 125 µs
• Measuring range scalable	No	No	No
• Scalable measured values			No
• Adjustment of measuring range			No
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	V14 / -	V13	V13 SP1
• STEP 7 configurable/integrated from version	V5.6 and higher	V5.5 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated from version	V8.1 SP1	V8.1 SP1	
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode			
• Oversampling	No	No	Yes; 2 channels per module
• MSI	No	Yes	No
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2-/4-Wire ST, PU 1	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
Analog inputs			
Number of analog inputs	4; Differential inputs	2; Differential inputs	2; Differential inputs
• For current measurement		2	2
• For voltage measurement		2	2
permissible input voltage for voltage input (destruction limit), max.		30 V	30 V
permissible input current for current input (destruction limit), max.	50 mA	50 mA	50 mA
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)		125 µs
Analog input with oversampling		No	Yes
• Values per cycle, max.			16
• Resolution, min.			50 µs
Standardization of measured values		Yes	
Input ranges (rated values), voltages			
• 0 to +10 V		Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V		Yes; 15 bit	Yes; 13 bit
• -10 V to +10 V		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -5 V to +5 V		Yes; 16 bit incl. sign	Yes; 15 bit incl. sign
Input ranges (rated values), currents			
• 0 to 20 mA	Yes; 16 bit incl. sign	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 15 bit	Yes; 15 bit	Yes; 14 bit
Cable length			
• shielded, max.	1 000 m	1 000 m; 200 m for voltage measurement	1 000 m; 200 m for voltage measurement
Analog value generation for the inputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	
• Integration time (ms)		67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms	
• Basic conversion time, including integration time (ms)		68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms	
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800	No
• Conversion time (per channel)	180 / 60 / 50 ms	68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms	10 µs
• Basic execution time of the module (all channels released)		1 ms	
Smoothing of measured values			
• Number of smoothing levels	4; None; 4/8/16 times	6; none; 2-/4-/8-/16-/32-fold	7; none; 2-/4-/8-/16-/32-/64-fold
• Parameterizable	Yes	Yes	Yes
Encoder			
Connection of signal encoders			
• for voltage measurement	No	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω	650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes	Yes	Yes
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)		0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %
• Current, relative to input range, (+/-)	0.3 %	0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %

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Technical specifications (continued)

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2-/4-Wire ST, PU 1	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB		
• Common mode voltage, max.	10 V	35 V	35 V
• Common mode interference, min.	90 dB	90 dB	90 dB
Isochronous mode			
Filtering and processing time (TCI), min.		800 µs	80 µs
Bus cycle time (TDP), min.		1 ms	125 µs; Starting from firmware Version V2.0.1
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	No	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	
• Wire break	Yes; at 4 to 20 mA	Yes; Measuring range 4 to 20 mA only	Yes; channel-by-channel, at 4 to 20 mA only
• short-circuit	Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; channel-by-channel, at 1 to 5 V or for short-circuit in encoder supply	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply
• Group error	Yes	Yes	Yes
• Overflow/Underflow	Yes	Yes	Yes; channel by channel
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS07
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS07
• vertical installation, max.	50 °C	50 °C	50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	31 g	32 g	32 g

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
General information			
Product type designation	AI 8xRTD/TC 2-wire HF	AI 4xRTD/TC 2-/3-/4-wire HF	AI 4xTC HS
Product function			
• Isochronous mode	No	No	No

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Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
• Measuring range scalable	Yes	Yes	Yes
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	V16, V17 / V18	V12 SP1 / V13	V15 with HSP 265/integrated as of V15.1
• STEP 7 configurable/integrated from version	V5.5 SP3 / V5.5 SP4	V5.5 SP3 / V5.5 SP4	V5.5 SP3 or higher
• PCS 7 configurable/integrated from version	V8.1 SP1	V8.1 SP1	
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.35	GSDML V2.3	GSDML V2.3
Operating mode			
• Oversampling	No	No	No
• MSI	No	No	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Analog inputs			
Number of analog inputs	8	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V	30 V
Constant measurement current for resistance-type transmitter, typ.	2 mA	2 mA	
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary	5 ms; Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K
Input ranges (rated values), voltages			
• -1 V to +1 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -250 mV to +250 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -50 mV to +50 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -80 mV to +80 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), thermocouples			
• type B	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• type C	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type E	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type J	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type K	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type L	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type N	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type R	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type S	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type T	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type U	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer			
• Cu 10		Yes; 16 bit incl. sign	
• Ni 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• LG-Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 120	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	

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Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
• Pt 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
Input ranges (rated values), resistors			
• 0 to 150 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 300 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 600 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 3000 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 6000 ohms	Yes; 15 bit	Yes; 15 bit	
• PTC	Yes; 15 bit	Yes; 15 bit	
Thermocouple (TC)			
- Temperature compensation			
- Parameterizable	Yes	Yes	Yes
Cable length			
• shielded, max.	200 m; 50 m with thermocouples	200 m; 50 m with thermocouples	200 m; 100 m for thermocouples
Analog value generation for the inputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 / (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 / (67.5 / 22.5 / 18.75) ms	180/60/50/1.25 ms
Smoothing of measured values			
• Number of smoothing levels	4; None; 4/8/16 times	4; None; 4/8/16 times	4; None; 4/8/16 times
• Parameterizable	Yes	Yes	Yes
Encoder			
Connection of signal encoders			
• for voltage measurement	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes	Yes	
• for resistance measurement with three-wire connection	No	Yes	
• for resistance measurement with four-wire connection	No	Yes	
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	0.05 %	0.05 %	0.05 %; 0.2 % when SFU OFF
• Resistance, relative to input range, (+/-)	0.05 %	0.05 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB
• Common mode voltage, max.	10 V	10 V	60 V; DC
• Common mode interference, min.	90 dB	90 dB	90 dB
Interrupts/diagnostics/status information			
Diagnostics function		Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
• Overflow/Underflow	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9			Yes; Based on AMS 2750 E
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-30 °C	-30 °C; < 0 °C as of FS08	-30 °C; < 0 °C as of FS02
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C; < 0 °C as of FS08	-30 °C; < 0 °C as of FS02
• vertical installation, max.	50 °C	50 °C	50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP System Manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.			33 g

Article number	7MH4134-6LB00-0DA0 ET 200SP, AI 2xSG 4-/6-wire HS
General information	
Product type designation	AI 2xSG 4-/6-wire HS
Product function	
• Isochronous mode	Yes
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	Yes; ±0.5 ... 320 mV/V
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V14 SP1
• STEP 7 configurable/integrated from version	V5.6
• PROFIBUS from GSD version/GSD revision	V03.01.105
• PROFINET from GSD version/GSD revision	GSDML V2.33
Operating mode	
• Oversampling	Yes; 2 channels per module
• MSI	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Short-circuit protection	Yes
Analog inputs	
Number of analog inputs	2; Differential inputs

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Technical specifications (continued)

Article number	7MH4134-6LB00-0DA0 ET 200SP, AI 2xSG 4-/6-wire HS
Cycle time (all channels), min.	100 µs
Analog input with oversampling	Yes
• Values per cycle, max.	14
• Resolution, min.	100 µs
Input ranges	
• Strain gauges (full bridges)	Yes
Cable length	
• shielded, max.	500 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	28 bit; 16 bits with oversampling
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	60 / 50 Hz / no
• Conversion time (per channel)	100 µs
Smoothing of measured values	
• IIR low-pass filter frequency	0.01 ... 600 Hz
• IIR low-pass filter ordinal number	1 ... 4
• Notch filter frequency	0.1 ... 1 000 Hz
• Notch filter quality	5.00 ... 250.00
• Average value filter	0.1 ... 655.3 ms
Encoder	
Connection of signal encoders	
• For strain gauges (full bridges) with 4-conductor connection	Yes
• For strain gauges (full bridges) with 6-conductor connection	Yes
• Resistance of full bridge, min.	80 Ω
• Resistance of full bridge, max.	5 000 Ω
Errors/accuracies	
Temperature coefficient, zero point	≤ ±0.25 µV/K
Temperature coefficient, span, 4-wire connection (in relation to end value)	≤ ±5 ppm/K
Temperature coefficient, span, 6-wire connection (in relation to end value)	≤ ±10 ppm/K
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.05 %; See manual for details
Isochronous mode	
Filtering and processing time (TCI), min.	87 µs
Bus cycle time (TDP), min.	125 µs
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Diagnostic alarm
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• Group error	Yes
• Overflow/Underflow	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

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Technical specifications (continued)

Article number	7MH4134-6LB00-0DA0 ET 200SP, AI 2xSG 4-/6-wire HS
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

Article number	6ES7134-6PA01-0BU0 ET 200SP AI Energy Meter CT ST	6ES7134-6PA21-0BU0 ET 200SP AI Energy Meter RC ST	6ES7134-6PA01-0CU0 ET 200SP AI Energy Meter CT HF	6ES7134-6PA21-0CU0 ET 200SP AI Energy Meter RC HF
General information				
Product type designation	AI Energy Meter CT ST	AI Energy Meter RC ST	AI Energy Meter CT HF	AI Energy Meter RC HF
Product function				
• Voltage measurement	Yes	Yes	Yes	Yes
- without voltage transformer	Yes	Yes	Yes	Yes
- with voltage transformer	Yes	Yes	Yes	Yes
• Current measurement	Yes; max. 3 + neutral conductor	Yes; max. 3 + neutral conductor	Yes; Max. 4	Yes; Max. 4
- without current transformer	No	No	No	No
- with current transformer	Yes; 1 A or 5 A current transformer	No	Yes; 1 A or 5 A current transformer	No
- With Rogowski coil	No	Yes	No	Yes
- With current-voltage-converter	No	Yes; 333 mV interface	No	Yes; 333 mV interface
• Energy measurement	Yes	Yes	Yes	Yes
• Frequency measurement	Yes	Yes	Yes	Yes
• Power measurement	Yes	Yes	Yes	Yes
• Active power measurement	Yes	Yes	Yes	Yes
• Reactive power measurement	Yes	Yes	Yes	Yes
• Power factor measurement	Yes	Yes	Yes	Yes
• Active factor measurement	Yes	Yes	Yes	Yes
• Reactive power compensation	Yes	Yes	Yes	Yes
• Line analysis	No	No	Yes	Yes
- Monitoring of instantaneous and half-wave values			Yes	Yes
- THD measurement for current and voltage			Yes	Yes
- Harmonics for current and voltage			Yes	Yes
- Voltage dip (DIP)			Yes	Yes
- Voltage swell			Yes	Yes
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	No	No
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	Configurable via GSD file	Configurable via GSD file	V5.5 SP3 or higher	V5.5 SP3 or higher
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher

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Technical specifications (continued)

Article number	6ES7134-6PA01-0BU0 ET 200SP AI Energy Meter CT ST	6ES7134-6PA21-0BU0 ET 200SP AI Energy Meter RC ST	6ES7134-6PA01-0CU0 ET 200SP AI Energy Meter CT HF	6ES7134-6PA21-0CU0 ET 200SP AI Energy Meter RC HF
• PROFINET from GSD version/GSD revision	V2.3	V2.3	V2.3	V2.3
Operating mode				
• Switching between operating modes in RUN	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user
• Cyclic measured value access	Yes	Yes	Yes	Yes
• Acyclic measured value access	Yes	Yes	Yes	Yes
• Fixed measured value sets	Yes	Yes	Yes	Yes
• Freely definable measured value sets	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access
Installation type/mounting				
Mounting position	any	any	any	any
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Analog inputs				
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)
Cable length				
• shielded, max.	200 m	200 m	200 m	200 m
Interrupts/diagnostics/status information				
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
Diagnoses				
• Line quality			Yes	Yes
• Supply voltage	Yes	Yes	Yes	Yes
• Hardware interrupt lost	Yes	Yes	Yes	Yes
• Parameter assignment error	Yes	Yes	Yes	Yes
• Module fault	Yes	Yes	Yes	Yes
• Channel not available	Yes	Yes	Yes	Yes
• Overflow/Underflow	Yes	Yes	Yes	Yes
• Overload current	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes	Yes	Yes
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Integrated Functions				
Measuring functions				
• Measuring procedure for voltage measurement	TRMS	TRMS	TRMS	TRMS
• Measuring procedure for current measurement	TRMS	TRMS	TRMS	TRMS
• Type of measured value acquisition	seamless	seamless	seamless	seamless
• Curve shape of voltage	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted
• Buffering of measured variables	Yes	Yes	Yes	Yes
• Parameter length	128 byte	128 byte	128 byte	128 byte

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Technical specifications (continued)

Article number	6ES7134-6PA01-0BU0 ET 200SP AI Energy Meter CT ST	6ES7134-6PA21-0BU0 ET 200SP AI Energy Meter RC ST	6ES7134-6PA01-0CU0 ET 200SP AI Energy Meter CT HF	6ES7134-6PA21-0CU0 ET 200SP AI Energy Meter RC HF
• Bandwidth of measured value acquisition	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz
- Measuring range				
- Frequency measurement, min.	40 Hz	40 Hz	40 Hz	40 Hz
- Frequency measurement, max.	70 Hz	70 Hz	70 Hz	70 Hz
- Measuring inputs for voltage				
- Measurable line voltage between phase and neutral conductor	277 V	277 V	277 V	277 V
- Measurable line voltage between the line conductors	480 V	480 V	480 V	480 V
- Measurable line voltage between phase and neutral conductor, min.	3 V	3 V	3 V	3 V
- Measurable line voltage between phase and neutral conductor, max.	300 V	300 V	300 V	300 V
- Measurable line voltage between the line conductors, min.	6 V	6 V	6 V	6 V
- Measurable line voltage between the line conductors, max.	519 V	519 V	519 V	519 V
- Internal resistance line conductor and neutral conductor	1.5 MΩ	1.5 MΩ	1.5 MΩ	1.5 MΩ
- Power consumption per phase	60 mW; 300 V AC	60 mW; 300 V AC	60 mW; 300 V AC	60 mW; 300 V AC
- Impulse voltage resistance 1,2/50µs	2.5 kV	2.5 kV	2.5 kV	2.5 kV
- Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II		CAT II	
- Overvoltage category		CAT II according to IEC 61010 Part 1		CAT II according to IEC 61010 Part 1
- Measuring inputs for current				
- measurable relative current (AC), min.	1 %; Relative to measuring range; 1 A, 5 A		1 %; Relative to measuring range; 1 A, 5 A	
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current 5 A		120 %; Relative to the secondary rated current 5 A	
- Continuous current with AC, maximum permissible	5 A		5 A; 6 A permanent thermal overload	
- Apparent power consumption per phase for measuring range 5 A	0.6 VA		0.6 VA	
- Rated value short-time withstand current restricted to 1 s	100 A		100 A	
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal		25 mΩ; At the terminal	
- Surge strength	10 A; for 1 minute		10 A; for 1 minute	
- Zero point suppression	0 ... 20%, referred to the nominal current		0 ... 20%, referred to the nominal current	
- Measuring inputs for current (Rog. or I/U converter)				
- Measurable current at AC, max.		424 mV		424 mV
- Continuous voltage, maximum permissible		2 V		2 V
- Rated value, short-time withstand voltage restricted to 1 s		30 V		30 V
- Input resistance		120 kΩ		120 kΩ
- Zero point suppression		Yes; 0 ... 20%, referred to the nominal current		Yes; 0 ... 20%, referred to the nominal current
- Accuracy class according to IEC 61557-12				
- Measured variable voltage	0,2	0,2	0,2	0,2
- Measured variable current	0,2	0,2	0,2	0,2
- Measured variable apparent power	0.5	0.5	0.5	0.5
- Measured variable active power	0.5	0.5	0.5	0.5
- Measured variable reactive power	1	1	1	1
- Measured variable power factor	0.5	0.5	0.5	0.5

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Technical specifications (continued)

Article number	6ES7134-6PA01-0BU0 ET 200SP AI Energy Meter CT ST	6ES7134-6PA21-0BU0 ET 200SP AI Energy Meter RC ST	6ES7134-6PA01-0CU0 ET 200SP AI Energy Meter CT HF	6ES7134-6PA21-0CU0 ET 200SP AI Energy Meter RC HF
- Measured variable active energy	0.5	0.5	0.5	0.5
- Measured variable reactive energy	1	1	1	1
- Measured variable neutral current	0,2	0,2	0,2	0,2
- Measured variable phase angle	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12
- Measured variable frequency	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range
- Measured variable harmonic			1	1
- Measured variable THDU			1	1
- Measured variable THDI			1	1
- Accuracy class line analysis acc. to IEC 61000-4-30				
- Measured variable voltage			Class S	Class S
- Measured variable current			Class S	Class S
- Measured variable frequency			Class S	Class S
- Measured variable voltage interruption			Class S	Class S
- Measured variable voltage dip and swell			Class S	Class S
- Measured variable harmonic voltage			Class S	Class S
- Measured variable harmonic current			Class S	Class S
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	45 g	45 g	45 g	45 g
Other				
Data for selecting a voltage transformer				
• Secondary side, max.	300 V	300 V	300 V	300 V
Data for selecting a current transformer				
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual		As a function of cable length and cross section, see device manual	
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual		As a function of cable length and cross section, see device manual	

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Overview



- 2 and 4-channel analog output (AQ) modules
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the analog output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - Oversampling operating mode (n-fold isochronous output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
  - Isochronous mode (simultaneous isochronous output of analog values)
  - Output of substitute value in the event of communication interruptions (shutdown, output adjustable substitute value, or keep last value)
  - Calibration during runtime
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break, short-circuit, overflow, underflow
  - Value status (optional binary validity information of the analog value in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shield terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

Overview of analog output modules

Analog output	Pkg. unit	Article No.	CC code	BU type
AQ 2 x U ST	1	6ES7135-6FB00-0BA1	CC00	A0, A1
AQ 2 x I ST	1	6ES7135-6GB00-0BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6ES7135-6HD00-0BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6ES7135-6HB00-0CA1	CC00	A0, A1
AQ 2xU/I HS With two operating modes: • High-speed isochronous AQ • Oversampling	1	6ES7135-6HB00-0DA1	CC00	A0, A1
AQ 4xI HART HF	1	6ES7135-6TD00-0CA1	CC00	A0, A1

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Overview (continued)

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New potential group (light) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New potential group (light) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of the potential group (dark) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
BU type A1 • Forwarding of the potential group (dark) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--

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Overview (continued)

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

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Selection and ordering data

Analog output modules	
Analog output module AQ 2xU Standard, BU type A0 or A1, color code CC00, 16-bit	**6ES7135-6FB00-0BA1**
Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit	**6ES7135-6GB00-0BA1**
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC00, 16-bit, ± 0.3%	**6ES7135-6HD00-0BA1**
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%	**6ES7135-6HB00-0CA1**
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16-bit, ± 0.3%	**6ES7135-6HB00-0DA1**
Analog output module AQ 4xI HART High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.3%	**6ES7135-6TD00-0CA1**
Suitable type A0 BaseUnits	
Types of delivery: Apart from the standard type of delivery in a single-unit package, selected BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules. The number of modules required is the number of modules ordered. The pack type is selected by selecting the Article No. Packs of 10 can therefore only be ordered in integer multiples of 10.	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Suitable type A1 BaseUnits (temperature detection)	
BU15-P16+A0+12D/T	**6ES7193-6BP40-0DA1**
BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new potential group (max. 10 A)	

Selection and ordering data (continued)

BU15-P16+A0+2D/T	**6ES7193-6BP00-0DA1**
BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
BU15-P16+A0+12B/T	**6ES7193-6BP40-0BA1**
BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the potential group	
BU15-P16+A0+2B/T	**6ES7193-6BP00-0BA1**
BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	**6ES7193-6UP00-0BP2**
PotDis TB	
PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm	**6ES7133-6CV15-1AM0**
• 20 mm	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP00-2MA0**
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP00-4MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**

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Selection and ordering data (continued)

Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	**6ES7193-6CP74-2AA0**
Color-coded labels for PotDis BU	
Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**
Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**
Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7135-6FB00-0BA1 ET 200SP, AQ 2xU Standard, PU 1	6ES7135-6GB00-0BA1 ET 200SP, AQ 2xI Standard, PU 1	6ES7135-6HD00-0BA1 ET 200SP, AQ 4xU/I ST	6ES7135-6HB00-0DA1 ET 200SP, AQ 2 X U/I High Speed	6ES7135-6HB00-0CA1 ET 200SP, AQ 2 X U/I High Feature
General information					
Product type designation	AQ 2xU ST	AQ 2xI ST	AQ 4xU/I ST	AQ 2xU/I HS	AQ 2xU/I HF
Product function					
• Isochronous mode	No	No	No	Yes; 125 µs	Yes; 250 µs
• Output range scalable	No	No	No		
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 / -	V13 SP1 / -	V11 SP2 / V13	V13 SP1	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated from version			V8.1 SP1		V8.1 SP1
• PROFIBUS from GSD version/GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• Oversampling	No	No	No	Yes; 2 channels per module	No
• MSO	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Analog outputs					
Number of analog outputs	2	2	4	2	2
Cycle time (all channels), min.	1 ms	1 ms	5 ms	125 µs	750 µs
Analog output with oversampling	No	No	No	Yes	
• Values per cycle, max.				16	
• Resolution, min.				45 µs; (2 channels), 35 µs (1 channel)	
Output ranges, voltage					
• 0 to 10 V	Yes; 15 bit		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V	Yes; 13 bit		Yes; 13 bit	Yes; 13 bit	Yes; 13 bit
• -5 V to +5 V	Yes; 15 bit incl. sign		Yes; 15 bit incl. sign	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Output ranges, current					
• 0 to 20 mA		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA		Yes; 14 bit	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit
Connection of actuators					
• for voltage output two-wire connection	Yes		Yes	Yes	Yes
• for voltage output four-wire connection	No		Yes	Yes	Yes
• for current output two-wire connection		Yes	Yes	Yes	Yes
Load impedance (in rated range of output)					
• with voltage outputs, min.	2 kΩ		2 kΩ	2 kΩ	2 kΩ
• with voltage outputs, capacitive load, max.	1 µF		1 µF	1 µF	1 µF
• with current outputs, max.		500 Ω	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.		1 mH	1 mH	1 mH	1 mH
Cable length					
• shielded, max.	200 m	1 000 m	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output

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Technical specifications (continued)

Article number	6ES7135-6FB00-0BA1 ET 200SP, AQ 2xU Standard, PU 1	6ES7135-6GB00-0BA1 ET 200SP, AQ 2xI Standard, PU 1	6ES7135-6HD00-0BA1 ET 200SP, AQ 4xU/I ST	6ES7135-6HB00-0DA1 ET 200SP, AQ 2 X U/I High Speed	6ES7135-6HB00-0CA1 ET 200SP, AQ 2 X U/I High Feature
Analog value generation for the outputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
Settling time					
• for resistive load	0.1 ms	0.1 ms; Typical value	0.1 ms	0.05 ms	0.05 ms
• for capacitive load	1 ms		1 ms	0.05 ms; Max. 47 nF and 20 m cable length	0.05 ms; Max. 47 nF and 20 m cable length
• for inductive load		0.5 ms	0.5 ms	0.05 ms	0.05 ms
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
Isochronous mode					
Execution and activation time (TCO), min.				70 µs	500 µs
Bus cycle time (TDP), min.				125 µs	750 µs
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire break		Yes	Yes; module-by-module, only for output type "current"	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"
• short-circuit	Yes; module-wise		Yes; module-by-module, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/Underflow	Yes; module-wise	Yes; module-wise	Yes; module-wise	Yes	Yes; channel by channel
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS04
• horizontal installation, max.	60 °C	60 °C	60 °C; Observe derating	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS04
• vertical installation, max.	50 °C	50 °C	50 °C; Observe derating	50 °C	50 °C
Altitude during operation relating to sea level					

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Technical specifications (continued)

Article number	6ES7135-6FB00-0BA1 ET 200SP, AQ 2xU Standard, PU 1	6ES7135-6GB00-0BA1 ET 200SP, AQ 2xI Standard, PU 1	6ES7135-6HD00-0BA1 ET 200SP, AQ 4xU/I ST	6ES7135-6HB00-0DA1 ET 200SP, AQ 2 X U/I High Speed	6ES7135-6HB00-0CA1 ET 200SP, AQ 2 X U/I High Feature
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP System Manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP System Manual
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	31 g

Article number	6ES7135-6TD00-0CA1 ET 200SP, AQ 4xI HART HF
General information	
Product type designation	AQ 4xI HART HF
Product function	
• Isochronous mode	Yes; 250 µs
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V15 SP1
• STEP 7 configurable/integrated from version	V5.6 and higher
• PCS 7 configurable/integrated from version	V9.0 SP1
• PROFIBUS from GSD version/GSD revision	V04.02.14
• PROFINET from GSD version/GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog outputs	
Number of analog outputs	4
Cycle time (all channels), min.	3 ms
Output ranges, current	
• 0 to 20 mA	Yes; 16 bit incl. sign
• -20 mA to +20 mA	No
• 4 mA to 20 mA	Yes; 16 bit incl. sign
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Cable length	
• shielded, max.	800 m
Analog value generation for the outputs	
Settling time	
• for resistive load	2 ms; 750 ohm
• for capacitive load	2 ms
• for inductive load	2 ms
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.1 %
Protocols	
HART protocol	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes

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Technical specifications (continued)

Article number	6ES7135-6TD00-0CA1 ET 200SP, AQ 4xI HART HF
Diagnoses	
• Monitoring the supply voltage	Yes; module-wise
• Wire break	Yes; channel by channel
• short-circuit	Yes
• Overflow/Underflow	Yes; channel by channel
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	31 g

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Overview



- 4, 8 and 16-channel digital input (DI) modules

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with additional potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for nominal voltages of up to 24 V DC or 230 V AC
- PNP (sinking input) and NPN (sourcing input) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)

Overview (continued)

- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
  - Counting operating mode (multi-channel counter for pulse generators with 32-bit counting width and up to 10 kHz counting frequency)
  - Oversampling operating mode (n-fold isochronous acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Parameterizable input delay time
  - Isochronous mode (simultaneous isochronous reading of all input channels)
  - Hardware interrupt pulse stretching
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the input signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shield terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

SIPLUS digital input modules	
(Extended temperature range and exposure to environmental substances)	
DI 8x24VDC Standard, BU type A0, color code CC01	**6AG1131-6BF01-7BA0**
DI 8x24VDC Source Input, Basic, BU type A0, color code CC02	**6AG1131-6BF61-7AA0**
DI 16x24VDC Standard, BU type A0, color code CC00	**6AG1131-6BH01-7BA0**
DI 8x24VDC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI)	**6AG1131-6BF00-7CA0**
DI 4x120VAC-230VAC Standard, BU type B1, color code CC41	**6AG1131-6FD01-7BB1**
DI 8xNAMUR High Feature, BU type A0, color code CC01	**6AG1131-6TF00-7CA0**
DI 8x24VAC-48VUC Basic, BU type U0, color code CC20, module diagnostics	**6AG1131-6CF00-7AU0**
Suitable SIPLUS BaseUnits	
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
BU20-P12+A0+4B (Extended temperature range and exposure to environmental substances) BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group	**6AG1193-6BP20-7BB1**
BU20-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DU0**
BU20-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BU0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**

Selection and ordering data (continued)

SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, Digital input modules

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Technical specifications

Article number	6AG1131-6BF61-7AA0 SIPLUS ET 200SP DI 8x24VDC SOURCE BA	6AG1131-6BF01-7BA0 SIPLUS ET 200SP DI 8x24VDC ST	6AG1131-6BH01-7BA0 SIPLUS ET 200SP DI 16x24VDC ST
General information			
Product type designation	DI 8x24 VDC SRC BA	DI 8x24 VDC ST	DI 16x24VDC ST
Product function			
• Isochronous mode	No	No	No
• suitable for operation on PROFINET R1 IMs	Yes	Yes	Yes
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode			
• DI	Yes	Yes	Yes
• Counter	No	No	No
• Oversampling	No	No	No
• MSI	No	No	No
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Encoder supply			
Number of outputs		8	
Short-circuit protection	No	Yes; per module	
Digital inputs			
Number of digital inputs	8	8	16
Digital inputs, parameterizable	Yes	Yes	Yes
Sourcing/sinking input	Sourcing	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes		
Input characteristic curve in accordance with IEC 61131, type 3		Yes	Yes
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	30 V to -5 V (reference potential is L+)	-30 to +5 V	-30 to +5 V
• for signal "1"	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	6 mA	2.5 mA	2.5 mA
Input delay (for rated value of input voltage)			
- for standard inputs			
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
- parameterizable	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1131-6BF61-7AA0	6AG1131-6BF01-7BA0	6AG1131-6BH01-7BA0
	SIPLUS ET 200SP DI 8x24VDC SOURCE BA	SIPLUS ET 200SP DI 8x24VDC ST	SIPLUS ET 200SP DI 16x24VDC ST
• Monitoring of encoder power supply	No	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No
• Wire break	No	Yes; module-wise	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm
• short-circuit	No	Yes; module-wise	No
• Group error			Yes
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety functions	No	No	No
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request

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Technical specifications (continued)

Article number	6AG1131-6BF61-7AA0 SIPLUS ET 200SP DI 8x24VDC SOURCE BA	6AG1131-6BF01-7BA0 SIPLUS ET 200SP DI 8x24VDC ST	6AG1131-6BH01-7BA0 SIPLUS ET 200SP DI 16x24VDC ST
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	28 g	28 g	28 g

Article number	6AG1131-6BF00-7CA0 SIPLUS ET 200SP DI 8x24VDC HF	6AG1131-6FD01-7BB1 SIPLUS ET 200SP DI 4X120..230VAC ST	6AG1131-6TF00-7CA0 SIPLUS ET 200SP DI 8XNAMUR HF	6AG1131-6CF00-7AU0 SIPLUS ET 200SP DI 8x48VUC BA
General information				
Product type designation	DI 8x24 V DC HF	DI 4x120...230VAC ST	DI 8xNAMUR HF	DI 8x24VAC/48VUC BA
Product function				
• Isochronous mode	Yes; 250 µs	No	No	No
• suitable for operation on PROFINET R1 IMs	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode				
• DI	Yes	Yes	Yes	Yes
• Counter	No	No	Yes	No
• Oversampling	No	No	No	No
• MSI	Yes	No	No	No
Supply voltage				
Rated value (DC)	24 V		24 V	48 V
Rated value (AC)		230 V		48 V; 24 V/48 V; 50 Hz/60 Hz
Reverse polarity protection	Yes	No	Yes	Yes
Encoder supply				
Number of outputs	8	4	8	8

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Technical specifications (continued)

Article number	6AG1131-6BF00-7CA0 SIPLUS ET 200SP DI 8x24VDC HF	6AG1131-6FD01-7BB1 SIPLUS ET 200SP DI 4X120..230VAC ST	6AG1131-6TF00-7CA0 SIPLUS ET 200SP DI 8XNAMUR HF	6AG1131-6CF00-7AU0 SIPLUS ET 200SP DI 8x48VUC BA
Short-circuit protection	Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided	Yes	Yes; Per module, 5x 20 mm fuse, 2 A/250 V, quick-response, replaceable
NAMUR encoder supply				
• 8.2 V			Yes	
• Short-circuit protection			Yes	
• Output current per channel, max.			8 mA	
• Output current per module, max.			64 mA	
Digital inputs				
Number of digital inputs	8	4	8; NAMUR	8
Digital inputs, parameterizable	Yes	Yes	Yes	
Sourcing/sinking input	P-reading	P-reading	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1				Yes
Input characteristic curve in accordance with IEC 61131, type 2				No
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes		No
Pulse extension	Yes; Pulse duration from 4 µs		Yes; 0.5 s, 1 s, 2 s	No
• Length	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Edge evaluation	Yes; rising edge, falling edge, edge change		Yes; rising edge, falling edge, edge change	
Signal change flutter			Yes; 2 to 32 signal changes	
Flutter observation window			Yes; 0.5 s, 1 s to 100 s in 1-s steps	
Digital input functions, parameterizable				
• Gate start/stop			Yes	
• Freely usable digital input			Yes	
• Counter			Yes	
Input voltage				
• Rated value (DC)	24 V		8.2 V	
• Rated value (AC)		230 V		
• for signal "0"	-30 to +5 V	0V AC to 40V AC		AC/DC < 10 V
• for signal "1"	+11 to +30V	74 V AC to 264 V AC		AC > 14 V, DC > 34 V
Input current				
• for signal "1", typ.	2.5 mA	10.8 mA		3.5 mA
- for 10 k switched contact				
- for signal "0", min.			0.35 mA	
- for signal "0", max.			1.2 mA	
- for signal "1", min.			2.1 mA	
- for signal "1", max.			7 mA	
- for unswitched contact				
- for signal "0", max. (permissible quiescent current)			0.5 mA	
- for signal "1", typ.			8 mA	
- for NAMUR encoders				
- for signal "0", min.			0.35 mA	
- for signal "0", max.			1.2 mA	
- for signal "1", min.			2.1 mA	
- for signal "1", max.			7 mA	
Input delay (for rated value of input voltage)				
• tolerated changeover time for changeover contacts			300 ms	
- for standard inputs				

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Technical specifications (continued)

Article number	6AG1131-6BF00-7CA0 SIPLUS ET 200SP DI 8x24VDC HF	6AG1131-6FD01-7BB1 SIPLUS ET 200SP DI 4X120..230VAC ST	6AG1131-6TF00-7CA0 SIPLUS ET 200SP DI 8XNAMUR HF	6AG1131-6CF00-7AU0 SIPLUS ET 200SP DI 8x48VUC BA
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	No	No	No
- for NAMUR inputs				
- at "0" to "1", max.			20 ms; See manual for details	
- at "1" to "0", max.			20 ms; See manual for details	
Encoder				
Connectable encoders				
• NAMUR encoder/changeover contact according to EN 60947			Yes	
• Single contact / changeover contact unconnected			Yes	
• Single contact / changeover contact connected with 10 kΩ			Yes	
• 2-wire sensor	Yes	Yes		Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA			
Isochronous mode				
Filtering and processing time (TCI), min.	420 µs			
Bus cycle time (TDP), min.	500 µs			
Interrupts/diagnostics/status information				
Diagnostics function	Yes		Yes	Yes
Alarms				
• Diagnostic alarm	Yes; channel by channel	No	Yes; channel by channel	Yes
• Maintenance interrupt		No		
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7	No	Yes; Parameterizable, channels 0 to 7	
Diagnoses				
• Diagnostic information readable	Yes		Yes	Yes
• Monitoring the supply voltage	Yes	No	Yes	Yes
- parameterizable	Yes		Yes	
• Monitoring of encoder power supply	Yes; channel by channel		No	Yes
• Wire break	Yes; Channel by channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No	Yes; channel by channel	
• short-circuit	Yes; channel by channel	No	Yes; channel by channel	
• Group error				Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	No	Yes; red LED	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Ambient conditions				
Ambient temperature during operation				

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Technical specifications (continued)

Article number	6AG1131-6BF00-7CA0 SIPLUS ET 200SP DI 8x24VDC HF	6AG1131-6FD01-7BB1 SIPLUS ET 200SP DI 4X120..230VAC ST	6AG1131-6TF00-7CA0 SIPLUS ET 200SP DI 8XNAMUR HF	6AG1131-6CF00-7AU0 SIPLUS ET 200SP DI 8x48VUC BA
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C encoder supply output current max. 350 mA per channel	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 4 (no adjacent points)	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	2 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)

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Technical specifications (continued)

Article number	6AG1131-6BF00-7CA0 SIPLUS ET 200SP DI 8x24VDC HF	6AG1131-6FD01-7BB1 SIPLUS ET 200SP DI 4X120..230VAC ST	6AG1131-6TF00-7CA0 SIPLUS ET 200SP DI 8XNAMUR HF	6AG1131-6CF00-7AU0 SIPLUS ET 200SP DI 8x48VUC BA
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions				
Width	15 mm	20 mm	15 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	28 g	36 g	32 g	40 g

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Overview



- 4, 8 and 16-channel DQ modules
- 4-channel RQ modules
- BaseUnits for single conductor or multiple-conductor connection
- Function classes Basic, Standard, High Feature and High-Speed as well as fail-safe DQ and RQ
- Clear labeling on front of module
- LEDs for diagnostics, status and errors
- Individual system-integrated load group formation with self-assembling potential multi-terminal busbars (power module not required for ET 200SP)
- Electronically readable nameplate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
  - Labeling strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shield terminal

Overview of digital output modules

Digital output	Pkg. unit	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A ST	1	6AG1132-6BH01-7BA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6AG1132-6BF61-7AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A ST	1	6AG1132-6BF01-7BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6AG1132-6BF00-7CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6AG1132-6BD20-7BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6AG1132-6BD20-7CA0	CC02	A0
DQ 4 x 24 ... 230 V AC/2 A HF With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control	1	6AG1132-6FD00-7CU0	CC20	U0
RQ 4 x 24 V UC/2 A CO ST	1	6AG1132-6GD51-7BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6AG1132-6HD01-7BB1	--	B0, B1

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

SIPLUS digital output modules	
(Extended temperature range and exposure to environmental substances)	
Digital output module DQ 8x24VDC/0.5A Sink output, Basic, BU type A0, color code CC01	**6AG1132-6BF61-7AA0**
Digital output module DQ 4x24VDC/2A Standard, BU type A0, color code CC02	**6AG1132-6BD21-7BA0**
Digital output module DQ 8x24VDC/0.5A Standard, BU type A0, color code CC02	**6AG1132-6BF01-7BA0**
Digital output module DQ 8x24VDC/0.5A High Feature, BU type A0, color code CC02	**6AG1132-6BF01-7CA0**
Digital output module DQ 16x24VDC/0.5A Standard, BU type A0, color code CC00	**6AG1132-6BH01-7BA0**
Digital output module DQ 4x24VDC/2A High Feature, BU type A0, color code CC02, channel-precise diagnostics, isochronous mode, shared output (MSO); Pkg. unit: 1 unit	**6AG1132-6BD21-7CA0**
Signal relay module RQ CO 4x24VUC/2A Standard, changeover contact, BU type A0, color code CC00	**6AG1132-6GD51-7BA0**
Relay module RQ NO 4x120VDC-230VAC/5A Standard, NO contact, BU type B0, B1	**6AG1132-6HD01-7BB1**
Digital output module DQ 4x24VAC...230VAC/2A High Feature for BU type U0, color code CC20, 2 operating modes: DQ and PC (power control via phase angle, half-wave and full-wave control)	**6AG1132-6FD00-7CU0**
Suitable SIPLUS BaseUnits	
BU15-P16+A10+2D	**6AG1193-6BP20-7DA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A0+2D	**6AG1193-6BP00-7DA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	**6AG1193-6BP20-7BA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	
BU15-P16+A0+2B	**6AG1193-6BP00-7BA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
BU20-P12+A4+0B	**6AG1193-6BP20-7BB0**
(Extended temperature range and exposure to environmental substances)	
BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group; 1 unit	
BU20-P12+A0+4B	**6AG1193-6BP20-7BB1**
(Extended temperature range and exposure to environmental substances)	
BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; 1 unit	

Selection and ordering data (continued)

BU20-P16+A0+2D	**6AG1193-6BP00-7DU0**
(Extended temperature range and exposure to environmental substances)	
BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
BU20-P16+A0+2B	**6AG1193-6BP00-7BU0**
(Extended temperature range and exposure to environmental substances)	
BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19"	**6AG1193-6AB00-0AA0**
Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	
Other accessories	See SIMATIC ET 200SP, Digital output modules

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Technical specifications

Article number	6AG1132-6BF61-7AA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A SNK BA	6AG1132-6BF01-7BA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A ST	6AG1132-6BD21-7BA0 SIPLUS ET 200SP DQ 4x24VDC/2A ST
General information			
Product type designation	DQ 8x24VDC/0,5A SNK BA	DQ 8x24VDC/0,5A ST	DQ 4x24VDC/2A ST
Product function			
• Isochronous mode	No	No	No
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode			
• DQ	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No
• PWM	No	No	No
• Oversampling	No	No	No
• MSO	No	No	No
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection		Yes	Yes
Digital outputs			
Type of digital output	Sink output (NPN)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)
Number of digital outputs	8	8	4
Current-sinking	Yes	No	No
Current-sourcing	No	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes
output type acc. to IEC 61131, type 0.5		Yes	
output type acc. to IEC 61131, type 2			Yes
Short-circuit protection	Yes	Yes; Electronic	Yes; Electronic
Open-circuit detection		Yes	Yes
Limitation of inductive shutdown voltage to	Typ. 47 V	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes	Yes; supports input type 3 according to IEC 61131-2
Switching capacity of the outputs			
• with resistive load, max.	0.5 A	0.5 A	2 A
• with inductive load, max.		0.5 A	2 A
• on lamp load, max.	5 W	5 W	10 W
Load resistance range			
• lower limit	48 Ω	48 Ω	12 Ω
• upper limit	3 400 Ω	12 kΩ	3 400 Ω
Output current			
• for signal "1" rated value	0.5 A	0.5 A	2 A
• for signal "0" residual current, max.	5 µA	0.1 mA	0.1 mA
Output delay with resistive load			
• "0" to "1", typ.			50 µs
• "0" to "1", max.	300 µs	50 µs; at rated load	
• "1" to "0", typ.			100 µs
• "1" to "0", max.	600 µs	100 µs; at rated load	
Parallel switching of two outputs			
• for uprating	No	No	No
• for redundant control of a load	Yes	Yes	Yes
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"
• on lamp load, max.	10 Hz	10 Hz	10 Hz
Total current of the outputs			

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Technical specifications (continued)

Article number	6AG1132-6BF61-7AA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A SNK BA	6AG1132-6BF01-7BA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A ST	6AG1132-6BD21-7BA0 SIPLUS ET 200SP DQ 4x24VDC/2A ST
• Current per channel, max.	0.5 A	0.5 A	2 A
• Current per module, max.	4 A	4 A	8 A; see Equipment Manual "Derating curve"
Total current of the outputs (per module)			
- horizontal installation			
- up to 30 °C, max.			8 A
- up to 40 °C, max.			8 A
- up to 50 °C, max.			6 A
- up to 60 °C, max.	4 A	4 A	4 A
- vertical installation			
- up to 30 °C, max.			8 A
- up to 40 °C, max.			6 A
- up to 50 °C, max.	4 A	4 A	4 A
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
- parameterizable			Yes
• Wire break	No	Yes; module-wise	Yes; module-wise
• short-circuit	No		
• Short-circuit to ground		Yes; module-wise	Yes; module-wise
• Short-circuit to L+		Yes; module-wise	Yes; module-wise
• Group error	Yes		Yes
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety functions	No	No	No
Suitable for safety-related tripping of standard modules		No	
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. total current 1.0 A	70 °C; = Tmax; > +60 °C max. total current 2 A
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			

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Technical specifications (continued)

Article number	6AG1132-6BF61-7AA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A SNK BA	6AG1132-6BF01-7BA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A ST	6AG1132-6BD21-7BA0 SIPLUS ET 200SP DQ 4x24VDC/2A ST
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG119-3-6AB00-0AA0)
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193--6AB00-0AA0)
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	30 g	30 g	30 g

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Technical specifications (continued)

Article number	6AG1132-6BH01-7BA0 SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	6AG1132-6GD51-7BA0 SIPLUS ET 200SP RQ 4x24VDC/2A CO ST	6AG1132-6BF01-7CA0 SIPLUS ET 200SP DQ 8x24VDC/0.5A HF
General information			
Product type designation	DQ 16x24VDC/0.5A ST	RQ CO 4x24VDC/2A ST	DQ 8x24VDC/0.5A HF
Product function			
• Isochronous mode	No	No	Yes
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode			
• DQ	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No
• PWM	No	No	No
• Oversampling	No	No	No
• MSO	No	No	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Digital outputs			
Type of digital output	Source output (PNP, current-sourcing)	Relays	Source output (PNP, current-sourcing)
Number of digital outputs	16	4	8
Current-sinking	No	Yes	No
Current-sourcing	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes		Yes
Short-circuit protection	Yes; Electronic	No	Yes; Electronic
Open-circuit detection	Yes		Yes
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)		Typ. L+ (-50 V)
Controlling a digital input	Yes		Yes
Switching capacity of the outputs			
• with resistive load, max.	0.5 A		0.5 A
• with inductive load, max.	0.5 A		0.5 A
• on lamp load, max.	5 W		5 W
Load resistance range			
• lower limit	48 Ω		48 Ω
• upper limit	12 kΩ		12 kΩ
Output current			
• for signal "1" rated value	0.5 A		0.5 A
• for signal "0" residual current, max.	0.1 mA		0.1 mA
Output delay with resistive load			
• "0" to "1", typ.	50 µs		50 µs
• "1" to "0", typ.	100 µs		100 µs
Parallel switching of two outputs			
• for logic links		Yes	
• for uprating	No	No	No
• for redundant control of a load	Yes	Yes	Yes
Switching frequency			
• with resistive load, max.	100 Hz	2 Hz	100 Hz
• with inductive load, max.	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"		0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"
• on lamp load, max.	10 Hz		10 Hz
Total current of the outputs			
• Current per channel, max.	0.5 A	2 A	0.5 A
• Current per module, max.	8 A; see Equipment Manual "Derating curve"	8 A	4 A

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Technical specifications (continued)

Article number	6AG1132-6BH01-7BA0 SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	6AG1132-6GD51-7BA0 SIPLUS ET 200SP RQ 4x24VDC/2A CO ST	6AG1132-6BF01-7CA0 SIPLUS ET 200SP DQ 8x24VDC/0.5A HF
Total current of the outputs (per module)			
- horizontal installation			
- up to 40 °C, max.	8 A	8 A	
- up to 50 °C, max.	6 A	6 A	
- up to 60 °C, max.	4 A	4 A	4 A
- up to 70 °C, max.			3 A
- vertical installation			
- up to 30 °C, max.	8 A	8 A	
- up to 40 °C, max.	6 A	6 A	
- up to 50 °C, max.	4 A	4 A	4 A
Relay outputs			
• Number of relay outputs		4	
• Rated supply voltage of relay coil L+ (DC)		24 V	
• Current consumption of relays (coil current of all relays), max.		40 mA	
• Number of operating cycles, max.		500 000	
- Switching capacity of contacts			
- with resistive load, max.		2 A	
- Thermal continuous current, max.		2 A	
- Switching current, min.		1 mA; 5 V DC	
- Rated switching voltage (DC)		24 V	
- Rated switching voltage (AC)		24 V	
Isochronous mode			
Execution and activation time (TCO), min.			48 µs
Bus cycle time (TDP), min.			500 µs
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
- parameterizable			Yes
• Wire break	Yes; module-wise	No	Yes; channel by channel
• short-circuit		No	
• Short-circuit to ground	Yes; module-wise		Yes; channel by channel
• Short-circuit to L+	Yes; module-wise		Yes; channel by channel
• Group error	Yes		Yes
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety functions	No	No	No
Suitable for safety-related tripping of standard modules	No		Yes; see FAQ Entry ID: 39198632
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1			PL d
• Category according to ISO 13849-1			Cat. 3
• SIL acc. to IEC 62061			SIL 2

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Technical specifications (continued)

Article number	6AG1132-6BH01-7BA0 SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	6AG1132-6GD51-7BA0 SIPLUS ET 200SP RQ 4x24VDC/2A CO ST	6AG1132-6BF01-7CA0 SIPLUS ET 200SP DQ 8x24VDC/0.5A HF
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. total current 1 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; > +60 °C max. total current 3 A
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna)	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-3-6AB00-0AA0)
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193--6AB00-0AA0)
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			

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Technical specifications (continued)

Article number	6AG1132-6BH01-7BA0 SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	6AG1132-6GD51-7BA0 SIPLUS ET 200SP RQ 4x24VDC/2A CO ST	6AG1132-6BF01-7CA0 SIPLUS ET 200SP DQ 8x24VDC/0.5A HF
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	30 g	30 g	30 g

Article number	6AG1132-6HD01-7BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	6AG1132-6FD00-7CU0 SIPLUS ET 200SP DQ 4X24..230VAC/2A HF	6AG1132-6BD21-7CA0 SIPLUS ET 200SP DQ 4x24VDC/2A HF
General information			
Product type designation	RQ 4x120 VDC ... 230 VAC/5 A NO ST	DQ 4x24 ... 230 V AC/2 A HF	DQ 4x24VDC/2A HF
Product function			
• Isochronous mode	No	No	Yes
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode			
• DQ	Yes	Yes	Yes
• DQ with energy-saving function	No	Yes	No
• PWM	No	No	No
• Oversampling	No	No	No
• MSO	No	No	Yes
• Phase control		Yes; Control area: 8.5 ... 100% of the phase angle	
• Trailing-edge phase		No	
• Half-wave		Yes	
• Full-wave		Yes	
Supply voltage			
Rated value (DC)	24 V		24 V
Rated value (AC)		230 V; 47 ... 63 Hz, max. rate of change of frequency 1 mHz/s	
Reverse polarity protection	Yes		Yes
Digital outputs			
Type of digital output	Relays	Triac	Source output (PNP, current-sourcing)
Number of digital outputs	4	4	4
Current-sinking	Yes	No	No
Current-sourcing	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes
output type acc. to IEC 61131, type 2			Yes
Short-circuit protection	No	No; external fusing necessary	Yes; Electronic
Open-circuit detection		Yes; channel by channel	Yes

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Technical specifications (continued)

Article number	6AG1132-6HD01-7BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	6AG1132-6FD00-7CU0 SIPLUS ET 200SP DQ 4X24..230VAC/2A HF	6AG1132-6BD21-7CA0 SIPLUS ET 200SP DQ 4x24VDC/2A HF
Overload protection		No; A miniature fuse with 10 tripping current and tripping characteristic "quick response" must be provided in the module supply	
Limitation of inductive shutdown voltage to			Typ. L+ (-50 V)
Controlling a digital input		Yes	Yes
Switching capacity of the outputs			
• with resistive load, max.		2 A; Max. 4 A, see additional description in manual	2 A
• with inductive load, max.		2 A	2 A
• on lamp load, max.		100 W; Tungsten rating in accordance with UL; for thermistors with higher power ratings, see the notes in the manual	10 W
Load resistance range			
• lower limit			12 Ω
• upper limit			3 400 Ω
Output voltage			
• for signal "1", min.		20.4 V	
Output current			
• for signal "1" rated value		2 A	2 A
• for signal "0" residual current, max.		3 mA	0.1 mA
Output delay with resistive load			
• "0" to "1", typ.			50 µs
• "0" to "1", max.		40 ms; 2 AC cycles	
• "1" to "0", typ.			100 µs
• "1" to "0", max.		20 ms; 1 AC cycle	
Parallel switching of two outputs			
• for logic links	Yes	No	
• for uprating	No	No	No
• for redundant control of a load	Yes	Yes	Yes
Switching frequency			
• with resistive load, max.	2 Hz	10 Hz; Applies to DQ mode; limited by line frequency in PC mode	100 Hz
• with inductive load, max.			0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.5 Hz; provide one freewheeling diode for switching frequencies higher than 0.1 Hz		
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	0.5 Hz	10 Hz; Applies to DQ mode; limited by line frequency in PC mode	
• on lamp load, max.	2 Hz	1 Hz; Applies to DQ mode; limited by line frequency in PC mode	10 Hz
Total current of the outputs			
• Current per channel, max.	5 A; > +60 °C max. continuous current per relay 3 A	2 A; Max. 4 A, see additional description in manual	2 A
• Current per module, max.	20 A	8 A	8 A; see Equipment Manual "Derating curve"
Total current of the outputs (per module)			
- horizontal installation			
- up to 30 °C, max.			8 A
- up to 40 °C, max.		8 A; Applicable for current channels up to 2 A. For current channels between 2 A and 4 A, note derating data in the manual	8 A

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Technical specifications (continued)

Article number	6AG1132-6HD01-7BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	6AG1132-6FD00-7CU0 SIPLUS ET 200SP DQ 4X24..230VAC/2A HF	6AG1132-6BD21-7CA0 SIPLUS ET 200SP DQ 4x24VDC/2A HF
- up to 50 °C, max.	20 A	6 A; Applicable for current channels up to 2 A. For current channels between 2 A and 4 A, note derating data in the manual	6 A
- up to 60 °C, max.	16 A	4 A; Applicable for current channels up to 2 A. For current channels between 2 A and 4 A, note derating data in the manual	4 A
- up to 70 °C, max.		2 A; Applicable for current channels up to 2 A	2 A
- vertical installation			
- up to 30 °C, max.		8 A	8 A
- up to 40 °C, max.	20 A	6 A	6 A
- up to 50 °C, max.	16 A; in all other mounting positions	4 A	4 A
Relay outputs			
• Number of relay outputs	4		
• Rated supply voltage of relay coil L+ (DC)	24 V		
• Current consumption of relays (coil current of all relays), max.	40 mA		
• external protection for relay outputs	Yes, with miniature fuse max. 6 A tripping current and quick-response tripping characteristic		
• Number of operating cycles, max.	7 000 000; see additional description in the manual		
- Switching capacity of contacts			
- with inductive load, max.	2 A; see additional description in the manual		
- with resistive load, max.	5 A; see additional description in the manual		
- Thermal continuous current, max.	5 A; Max. 1 385 VA, 150 W		
- Switching current, min.	100 mA; 5 V DC		
- Rated switching voltage (DC)	24 V DC to 120 V DC		
- Rated switching voltage (AC)	24V AC to 230V AC		
Isochronous mode			
Execution and activation time (TCO), min.			75 µs
Bus cycle time (TDP), min.			500 µs
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Diagnostic information readable		Yes	
• Monitoring the supply voltage	Yes	Yes	Yes
- parameterizable			Yes
• Wire break	No	Yes; channel by channel	Yes; channel by channel
• short-circuit	No	No	
• Short-circuit to ground			Yes; channel by channel
• Short-circuit to L+			Yes; channel by channel
• Group error		Yes	Yes
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	Yes; red Fn LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation			
Potential separation channels			

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Technical specifications (continued)

Article number	6AG1132-6HD01-7BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	6AG1132-6FD00-7CU0 SIPLUS ET 200SP DQ 4X24..230VAC/2A HF	6AG1132-6BD21-7CA0 SIPLUS ET 200SP DQ 4x24VDC/2A HF
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety functions	No	No	No
Suitable for safety-related tripping of standard modules			Yes; see FAQ Entry ID: 39198632
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1			PL d
• Category according to ISO 13849-1			Cat. 3
• SIL acc. to IEC 62061			SIL 2
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. continuous current of 3 A per relay	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. total current 2 A
• vertical installation, min.	-40 °C; in all other mounting positions	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; in all other mounting positions	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	3 000 m	2 000 m	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG119-3-6AB00-0AA0)
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust

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Technical specifications (continued)

Article number	6AG1132-6HD01-7BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	6AG1132-6FD00-7CU0 SIPLUS ET 200SP DQ 4X24..230VAC/2A HF	6AG1132-6BD21-7CA0 SIPLUS ET 200SP DQ 4x24VDC/2A HF
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193--6AB00-0AA0)
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions			
Width	20 mm	20 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	40 g	50 g	30 g

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Overview



- 2, 4 and 8-channel analog input (AI) modules.
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the analog input modules offer:

- Function classes Basic, Standard, High Feature and High Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting current, voltage and resistance sensors, as well as thermocouples
- Option of connecting force and torque sensors
- Energy Meter for recording up to 600 electrical variables
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
  - Oversampling operating mode (n-fold isochronous acquisition of analog values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Isochronous mode (simultaneous isochronous reading of analog values)
    Scalable measuring range (adaptation of measuring range, increase of the 16-bit resolution by adapting the measuring range to a limited section)
  - Scaling of the measured values (transmission of the analog value normalized to the required physical value as a 32-bit floating point value)
  - Internal compensation of the line resistance for thermocouples by means of terminal temperature measurement in the BaseUnit for BU type A1
  - Internal compensation also for 2-wire resistance test by means of adjustable line resistance
  - Calibration during runtime
  - Single-channel galvanic isolation
  - HART communication
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break, short-circuit, overflow, underflow
  - Two upper and lower hardware interrupts in each case, interference frequency suppression, smoothing
  - Value status (optional binary validity information of the analog value in the process image)
  - Supports the PROFIenergy profile
- Optional accessories:
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shield terminal

A quick and clear comparison of the functions of the AI modules is offered by the TIA Selection Tool.

Overview of SIPLUS analog input modules

Analog input	Pkg. unit	Article No.	CC code	BU type
AI 8 x I 2/4-wire BA	1	6AG1134-6GF00-7AA1	CC01	A0, A1
AI 8 x U BA	1	6AG1134-6FF00-2AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6AG1134-6HD01-7BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	1	6AG1134-6GD01-7BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6AG1134-6TD00-2CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6AG1134-6HB00-2CA1	CC05	A0, A1
AI 2 x U/I 2/4-wire HS With two operating modes: • High-speed isochronous AI • Oversampling	1	6AG1134-6HB00-2DA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	10	6AG1134-6JF00-2CA1	CC00	A0, A1
AI 2 x SG 4/6-wire High Speed	1	6AG1134-6LB00-2DA0	CC00	U0
AI 4 x RTD/TC 2/3/4-wire HF	10	6AG1134-6JD00-2CA1	CC00	A0, A1

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Overview (continued)

AI 4 x TC High Speed	1	6AG1134-6JD00-2DA1	CC00	A0, A1
AI Energy Meter CT ST, for 1 A or 5 A current transformers	-	6AG1134-6PA01-7BU0	--	U0

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS analog input modules (Extended temperature range and exposure to environmental substances)	
Analog input module AI 8xI 2/4-wire BA, BU type A0 or A1, color code CC01	**6AG1134-6GF00-7AA1**
Analog input module AI 8xU BA, BU type A0 or A1, color code CC02	**6AG1134-6FF00-2AA1**
Analog input module AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%	**6AG1134-6HD01-7BA1**
Analog input module AI 4xI 2/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%	**6AG1134-6GD01-7BA1**
Analog input module AI 4xRTD/TC 2/3/4-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range	**6AG1134-6JD00-2CA1**
Analog input module AI 4xTC High Speed, BU type A0 or A1, color code CC00, channel diagnostics, 16-bit, +/-0.1%	**6AG1134-6JD00-2DA1**
Analog input module AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03	**6AG1134-6TD00-2CA1**
Analog input module AI 2xU/I 2/4-wire High Feature, BU type A0 or A1, color code CC05, 16-bit, ±0.1%, independent channel galvanic isolation, isochronous mode above 1 ms	**6AG1134-6HB00-2CA1**
Analog input module AI 2xU/I 2/4-wire High Speed, BU type A0 or A1, color code CC00, 16-bit, ±0.3%, isochronous mode above 250 µs, oversampling above 50 µs	**6AG1134-6HB00-2DA1**
Analog input module AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range	**6AG1134-6JF00-2CA1**
Analog AI 2xSG 4/6 wire HS, 4/6-wire High Speed, two-channel analog input module for strain gauges (full bridges), color code CC00, module diagnostics, 28/16 bit, 2xLC load cell interface (1-4 mV/V), suitable for BU type U0	**6AG1134-6LB00-2DA0**
Analog input module AI Energy Meter CT ST, for 1 A or 5 A current transformers	**6AG1134-6PA01-7BU0**
Suitable SIPLUS BaseUnits type A0	
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
Suitable SIPLUS BaseUnits type A1 (temperature detection)	
BU15-P16+A0+2D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA1**
BU15-P16+A0+2B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA1**
BU15-P16+A0+12D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	**6AG1193-6BP40-7DA1**
BU15-P16+A0+12B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	**6AG1193-6BP40-7BA1**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, Analog input modules

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Technical specifications

Article number	6AG1134-6GF00-7AA1	6AG1134-6FF00-2AA1	6AG1134-6HD01-7BA1	6AG1134-6GD01-7BA1	6AG1134-6TD00-2CA1
	SIPLUS ET 200SP AI 8XI 2-/4-WIRE BA	SIPLUS ET 200SP AI 8xU BASIC	SIPLUS ET 200SP AI 4xU/I 2-w ST	SIPLUS ET 200SP AI 4xI 2-/4-w ST	SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
General information					
Product type designation	AI 8xI 2-/4-wire BA	AI 8xU BA	AI 4x U/I 2-wire	AI 4xI 2-/4-wire ST	AI 4xI 2-wire HART
Product function					
• Isochronous mode	No	No	No	No	No
• Measuring range scalable	No	No	No	No	No
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode					
• Oversampling	No	No	No	No	No
• MSI	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Analog inputs					
Number of analog inputs	8; Single-ended	8; Single-ended	4; > 60 °C max. 1x ±20 mA or 4x ±10 V permissible	4; > 60 °C max. 1x ±20 mA permissible	4; Differential inputs
• For current measurement	8				4
permissible input voltage for voltage input (destruction limit), max.		30 V	30 V		
permissible input current for current input (destruction limit), max.	50 mA		50 mA	50 mA	50 mA
Cycle time (all channels), min.	1 ms; per channel	1 ms; per channel	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	
Input ranges (rated values), voltages					
• 0 to +10 V		Yes; 15 bit	Yes; 15 bit		
• 1 V to 5 V			Yes; 15 bit		
• -10 V to +10 V		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign		
• -5 V to +5 V			Yes; 16 bit incl. sign		
Input ranges (rated values), currents					
• 0 to 20 mA	Yes		Yes; 15 bit	Yes; 16 bit incl. sign	No
• -20 mA to +20 mA	Yes			Yes	No
• 4 mA to 20 mA	Yes		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit + sign
Cable length					
• shielded, max.	200 m	200 m	1 000 m; 200 m for voltage measurement	1 000 m	800 m
Analog value generation for the inputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes	Yes; channel by channel
• Interference voltage suppression for interference frequency f1 in Hz	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	10 / 50 / 60 Hz
• Conversion time (per channel)	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 ms	180 / 60 / 50 ms	
Smoothing of measured values					
• Number of smoothing levels	4	4	4; None; 4/8/16 times	4; None; 4/8/16 times	4; None; 4/8/16 times
• Parameterizable	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1134-6GF00-7AA1 SIPLUS ET 200SP AI 8XI 2-/4-WIRE BA	6AG1134-6FF00-2AA1 SIPLUS ET 200SP AI 8xU BASIC	6AG1134-6HD01-7BA1 SIPLUS ET 200SP AI 4xU/I 2-w ST	6AG1134-6GD01-7BA1 SIPLUS ET 200SP AI 4xI 2-/4-w ST	6AG1134-6TD00-2CA1 SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
Encoder					
Connection of signal encoders					
• for voltage measurement	No	Yes	Yes	No	No
• for current measurement as 2-wire transducer	Yes		Yes	Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω		650 Ω	650 Ω	
• for current measurement as 4-wire transducer	Yes	No	No	Yes	
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)		0.3 %	0.3 %		
• Current, relative to input range, (+/-)	0.3 %		0.3 %	0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency					
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB	60 dB
• Common mode voltage, max.			10 V	10 V	
• Common mode interference, min.			90 dB	90 dB	
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	No	No	No	No	Yes
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire break	Yes; at 4 to 20 mA	No	Yes; at 4 to 20 mA	Yes; at 4 to 20 mA	Yes; channel by channel
• short-circuit	Yes; Sensor supply to M; module by module	No	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/Underflow	Yes; module-wise	Yes; module-wise	Yes	Yes	Yes; channel by channel
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green PWR LED	Yes; green LED	Yes; green LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red LED	Yes; green/red LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262		
Suitable for applications according to CQI-9			Yes		

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Technical specifications (continued)

Article number	6AG1134-6GF00-7AA1 SIPLUS ET 200SP AI 8XI 2-/4-WIRE BA	6AG1134-6FF00-2AA1 SIPLUS ET 200SP AI 8xU BASIC	6AG1134-6HD01-7BA1 SIPLUS ET 200SP AI 4xU/I 2-w ST	6AG1134-6GD01-7BA1 SIPLUS ET 200SP AI 4xI 2-/4-w ST	6AG1134-6TD00-2CA1 SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
Security					
signed firmware update	Yes; firmware V2.0.0 or higher	Yes; firmware V2.0.0 or higher			
safely removing data	Yes; firmware V2.0.0 or higher	Yes; firmware V2.0.0 or higher			
data integrity	Yes; firmware V2.0.0 or higher	Yes; firmware V2.0.0 or higher			
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -30 °C
• horizontal installation, max.	70 °C; = Tmax	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA-0) or configured slots to the left and right of the module	70 °C; = Tmax; > 60 °C max. 1x ±20 mA or 4x ±10 V permissible	70 °C; = Tmax; > 60 °C max. 1x ±20 mA permissible	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA-0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost); start-up @ -30 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance					
- Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)
- Use on ships/at sea					

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Technical specifications (continued)

Article number	6AG1134-6GF00-7AA1 SIPLUS ET 200SP AI 8XI 2-/4-WIRE BA	6AG1134-6FF00-2AA1 SIPLUS ET 200SP AI 8xU BASIC	6AG1134-6HD01-7BA1 SIPLUS ET 200SP AI 4xU/I 2-w ST	6AG1134-6GD01-7BA1 SIPLUS ET 200SP AI 4xI 2-/4-w ST	6AG1134-6TD00-2CA1 SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)
- Usage in industrial process technology					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	31 g

Article number	6AG1134-6HB00-2-CA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6AG1134-6HB00-2-DA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6AG1134-6JF00-2-CA1 SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	6AG1134-6LB00-2-DA0 SIPLUS ET 200SP AI 2xSG 4/6 wire HS	6AG1134-6JD00-2-CA1 SIPLUS ET 200SP AI 4xRTD/TC HF	6AG1134-6JD00-2-DA1 SIPLUS ET 200SP AI 4x TC HS
General information						
Product type designation	AI 2xU/I 2-/4-wire HF	AI 2xU/I 2-/4-wire HS	AI 8xRTD/TC 2-wire HF	AI 2xSG 4-/6-wire HS	AI 4xRTD/TC 2-/3-/4-wire HF	AI 4xTC HS
Product function						
• Isochronous mode	Yes	Yes; 125 µs	No	Yes	No	No

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Technical specifications (continued)

Article number	6AG1134-6HB00-2-CA1	6AG1134-6HB00-2-DA1	6AG1134-6JF00-2-CA1	6AG1134-6LB00-2-DA0	6AG1134-6JD00-2-CA1	6AG1134-6JD00-2-DA1
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 2xSG 4/6 wire HS	SIPLUS ET 200SP AI 4xRTD/TC HF	SIPLUS ET 200SP AI 4x TC HS
• Measuring range scalable	No	No	Yes	Yes		Yes
• Scalable measured values		No		No		
• Adjustment of measuring range		No		Yes; ±0.5 ... 320 mV/V		
Engineering with						
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode						
• Oversampling	No	Yes; 2 channels per module	No	Yes; 2 channels per module	No	No
• MSI	Yes	No	No	No	No	Yes
Supply voltage						
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes		Yes
Encoder supply						
Short-circuit protection				Yes		
Analog inputs						
Number of analog inputs	2; Differential inputs	2; Differential inputs	8	2; Differential inputs	4	4
• For current measurement	2	2				
• For voltage measurement	2	2				
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V	30 V		30 V	30 V
permissible input current for current input (destruction limit), max.	50 mA	50 mA				
Constant measurement current for resistance-type transmitter, typ.			2 mA		2 mA	
Cycle time (all channels), min.		125 µs	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	100 µs	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary	5 ms; Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable			Yes; °C/°F/K		Yes; °C/°F/K	Yes; °C/°F/K
Analog input with oversampling	No	Yes		Yes		
• Values per cycle, max.		16		14		
• Resolution, min.		50 µs		100 µs		
Standardization of measured values	Yes					
Input ranges						
• Strain gauges (full bridges)				Yes		
Input ranges (rated values), voltages						
• 0 to +10 V	Yes; 15 bit	Yes; 15 bit				
• 1 V to 5 V	Yes; 15 bit	Yes; 13 bit				
• -1 V to +1 V			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign				
• -250 mV to +250 mV			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign

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Technical specifications (continued)

Article number	6AG1134-6HB00-2-CA1	6AG1134-6HB00-2-DA1	6AG1134-6JF00-2-CA1	6AG1134-6LB00-2-DA0	6AG1134-6JD00-2-CA1	6AG1134-6JD00-2-DA1
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 2xSG 4/6 wire HS	SIPLUS ET 200SP AI 4xRTD/TC HF	SIPLUS ET 200SP AI 4x TC HS
• -5 V to +5 V	Yes; 16 bit incl. sign	Yes; 15 bit incl. sign				
• -50 mV to +50 mV			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -80 mV to +80 mV			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), currents						
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit				
• -20 mA to +20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign				
• 4 mA to 20 mA	Yes; 15 bit	Yes; 14 bit				
Input ranges (rated values), thermocouples						
• type B			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• type C			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type E			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type J			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type K			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type L			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type N			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type R			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type S			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type T			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type U			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer						
• Cu 10					Yes; 16 bit incl. sign	
• Ni 100			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• Ni 1000			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• LG-Ni 1000			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• Ni 120			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• Ni 200			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• Ni 500			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• Pt 100			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• Pt 1000			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• Pt 200			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
• Pt 500			Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
Input ranges (rated values), resistors						
• 0 to 150 ohms			Yes; 15 bit		Yes; 15 bit	
• 0 to 300 ohms			Yes; 15 bit		Yes; 15 bit	
• 0 to 600 ohms			Yes; 15 bit		Yes; 15 bit	
• 0 to 3000 ohms			Yes; 15 bit		Yes; 15 bit	
• 0 to 6000 ohms			Yes; 15 bit		Yes; 15 bit	
• PTC			Yes; 15 bit		Yes; 15 bit	
Thermocouple (TC)						
- Temperature compensation						
- Parameterizable			Yes		Yes	Yes
Cable length						
• shielded, max.	1 000 m; 200 m for voltage measurement	1 000 m; 200 m for voltage measurement	200 m; 50 m with thermocouples	500 m	200 m; 50 m with thermocouples	200 m; 100 m for thermocouples
Analog value generation for the inputs						
Integration and conversion time/resolution per channel						

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Technical specifications (continued)

Article number	6AG1134-6HB00-2-CA1	6AG1134-6HB00-2-DA1	6AG1134-6JF00-2-CA1	6AG1134-6LB00-2-DA0	6AG1134-6JD00-2-CA1	6AG1134-6JD00-2-DA1
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 2xSG 4/6 wire HS	SIPLUS ET 200SP AI 4xRTD/TC HF	SIPLUS ET 200SP AI 4x TC HS
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	28 bit; 16 bits with oversampling	16 bit	16 bit
• Integration time, parameterizable	Yes		Yes	Yes	Yes	Yes
• Integration time (ms)	67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms					
• Basic conversion time, including integration time (ms)	68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms					
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800	No	16.6 / 50 / 60 Hz	60 / 50 Hz / no	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms	10 µs	180 / 60 / 50 ms	100 µs	180 / 60 / 50 / (67.5 / 22.5 / 18.75) ms	180/60/50/1.25 ms
• Basic execution time of the module (all channels released)	1 ms					
Smoothing of measured values						
• Number of smoothing levels	6; none; 2-/4-/8-/16-/32-fold	7; none; 2-/4-/8-/16-/32-/64--fold	4; None; 4/8/16 times		4; None; 4/8/16 times	4; None; 4/8/16 times
• Parameterizable	Yes	Yes	Yes		Yes	Yes
• IIR low-pass filter frequency				0.01 ... 600 Hz		
• IIR low-pass filter ordinal number				1 ... 4		
• Notch filter frequency				0.1 ... 1 000 Hz		
• Notch filter quality				5.00 ... 250.00		
• Average value filter				0.1 ... 655.3 ms		
Encoder						
Connection of signal encoders						
• for voltage measurement	Yes	Yes	Yes		Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes				
- Burden of 2-wire transmitter, max.	650 Ω	650 Ω				
• for current measurement as 4-wire transducer	Yes	Yes				
• for resistance measurement with two-wire connection			Yes		Yes	
• for resistance measurement with three-wire connection			No		Yes	
• for resistance measurement with four-wire connection			No		Yes	
• For strain gauges (full bridges) with 4-conductor connection				Yes		
• For strain gauges (full bridges) with 6-conductor connection				Yes		
• Resistance of full bridge, min.				80 Ω		
• Resistance of full bridge, max.				5 000 Ω		
Errors/accuracies						
Temperature coefficient, zero point				≤ ±0.25 µV/K		

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Technical specifications (continued)

Article number	6AG1134-6HB00-2-CA1	6AG1134-6HB00-2-DA1	6AG1134-6JF00-2-CA1	6AG1134-6LB00-2-DA0	6AG1134-6JD00-2-CA1	6AG1134-6JD00-2-DA1
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 2xSG 4/6 wire HS	SIPLUS ET 200SP AI 4xRTD/TC HF	SIPLUS ET 200SP AI 4x TC HS
Temperature coefficient, span, 4-wire connection (in relation to end value)				≤ ±5 ppm/K		
Temperature coefficient, span, 6-wire connection (in relation to end value)				≤ ±10 ppm/K		
Basic error limit (operational limit at 25 °C)						
• Voltage, relative to input range, (+/-)	0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %	0.05 %	0.05 %; See manual for details	0.05 %	0.05 %; 0.2 % when SFU OFF
• Current, relative to input range, (+/-)	0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %				
• Resistance, relative to input range, (+/-)			0.05 %		0.05 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency						
• Series mode interference (peak value of interference < rated value of input range), min.			70 dB		70 dB	70 dB
• Common mode voltage, max.	35 V	35 V	10 V		10 V	60 V; DC
• Common mode interference, min.	90 dB	90 dB	90 dB		90 dB	90 dB
Isochronous mode						
Filtering and processing time (TCI), min.	800 µs	80 µs		87 µs		
Bus cycle time (TDP), min.	1 ms	125 µs; Starting from firmware Version V2.0.1		125 µs		
Interrupts/diagnostics/status information						
Diagnostics function	Yes		Yes	Yes; Diagnostic alarm	Yes	Yes
Alarms						
• Diagnostic alarm	Yes	Yes	Yes	Yes; Parameterizable	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses						
• Monitoring the supply voltage	Yes		Yes	Yes	Yes	Yes
• Wire break	Yes; Measuring range 4 to 20 mA only	Yes; channel-by-channel, at 4 to 20 mA only	Yes; channel by channel	Yes	Yes; channel by channel	Yes; channel by channel
• short-circuit	Yes; channel-by-channel, at 1 to 5 V or for short-circuit in encoder supply	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply		Yes		
• Group error	Yes	Yes	Yes	Yes	Yes	Yes
• Overflow/Underflow	Yes	Yes; channel by channel	Yes; channel by channel	Yes	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED						
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED

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Technical specifications (continued)

Article number	6AG1134-6HB00-2-CA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6AG1134-6HB00-2-DA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6AG1134-6JF00-2-CA1 SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	6AG1134-6LB00-2-DA0 SIPLUS ET 200SP AI 2xSG 4/6 wire HS	6AG1134-6JD00-2-CA1 SIPLUS ET 200SP AI 4xRTD/TC HF	6AG1134-6JD00-2-DA1 SIPLUS ET 200SP AI 4x TC HS
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red LED
Potential separation						
Potential separation channels						
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates						
Suitable for applications according to AMS 2750						Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9						Yes; Based on AMS 2750 E
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00--7BA0) or configured slots to the left and right of the module including derating of the encoder supply to max. 50 mA per channel	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7-BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00--7BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7-BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00--7BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -30 °C	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity						
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance						
- Coolants and lubricants						
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems						

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Technical specifications (continued)

Article number	6AG1134-6HB00-2-CA1	6AG1134-6HB00-2-DA1	6AG1134-6JF00-2-CA1	6AG1134-6LB00-2-DA0	6AG1134-6JD00-2-CA1	6AG1134-6JD00-2-DA1
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 2xSG 4/6 wire HS	SIPLUS ET 200SP AI 4xRTD/TC HF	SIPLUS ET 200SP AI 4x TC HS
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00--0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0-AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00--0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0-AA0//6AG1193-6AB-00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00--0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0-AA0)
- Use on ships/at sea						
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00--0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0-AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00--0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0-AA0/6AG1193-6AB-00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00--0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0-AA0)
- Usage in industrial process technology						
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark						
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!		* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating						

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Technical specifications (continued)

Article number	6AG1134-6HB00-2-CA1	6AG1134-6HB00-2-DA1	6AG1134-6JF00-2-CA1	6AG1134-6LB00-2-DA0	6AG1134-6JD00-2-CA1	6AG1134-6JD00-2-DA1
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 2xSG 4/6 wire HS	SIPLUS ET 200SP AI 4xRTD/TC HF	SIPLUS ET 200SP AI 4x TC HS
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions						
Width	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm	58 mm
Weights						
Weight, approx.	32 g	32 g	32 g	30 g	30 g	33 g

Article number	6AG1134-6PA01-7BU0
	SIPLUS ET 200SP AI EM CT ST
General information	
Product type designation	AI Energy Meter CT ST
Product function	
• Voltage measurement	Yes
- without voltage transformer	Yes
- with voltage transformer	Yes
• Current measurement	Yes; max. 3 + neutral conductor
- without current transformer	No
- with current transformer	Yes; 1 A or 5 A current transformer
- With Rogowski coil	No
- With current-voltage-converter	No
• Energy measurement	Yes
• Frequency measurement	Yes
• Power measurement	Yes
• Active power measurement	Yes
• Reactive power measurement	Yes
• Power factor measurement	Yes
• Active factor measurement	Yes
• Reactive power compensation	Yes
• Line analysis	No
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Operating mode	
• Switching between operating modes in RUN	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user
• Cyclic measured value access	Yes
• Acyclic measured value access	Yes
• Fixed measured value sets	Yes
• Freely definable measured value sets	Yes; For cyclic and acyclic measured value access
Installation type/mounting	
Mounting position	any

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Technical specifications (continued)

Article number	6AG1134-6PA01-7BU0 SIPLUS ET 200SP AI EM CT ST
Supply voltage	
Rated value (DC)	24 V
Analog inputs	
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)
Cable length	
• shielded, max.	200 m
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
• Hardware interrupt	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
Diagnoses	
• Supply voltage	Yes
• Hardware interrupt lost	Yes
• Parameter assignment error	Yes
• Module fault	Yes
• Channel not available	Yes
• Overflow/Underflow	Yes
• Overload current	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Measuring functions	
• Measuring procedure for voltage measurement	TRMS
• Measuring procedure for current measurement	TRMS
• Type of measured value acquisition	seamless
• Curve shape of voltage	Sinusoidal or distorted
• Buffering of measured variables	Yes
• Parameter length	128 byte
• Bandwidth of measured value acquisition	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz
- Measuring range	
- Frequency measurement, min.	40 Hz
- Frequency measurement, max.	70 Hz
- Measuring inputs for voltage	
- Measurable line voltage between phase and neutral conductor	277 V
- Measurable line voltage between the line conductors	480 V
- Measurable line voltage between phase and neutral conductor, min.	3 V
- Measurable line voltage between phase and neutral conductor, max.	300 V
- Measurable line voltage between the line conductors, min.	6 V
- Measurable line voltage between the line conductors, max.	519 V
- Internal resistance line conductor and neutral conductor	1.5 MΩ
- Power consumption per phase	60 mW; 300 V AC
- Impulse voltage resistance 1,2/50µs	2.5 kV
- Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II
- Measuring inputs for current	
- measurable relative current (AC), min.	1 %; Relative to measuring range; 1 A, 5 A
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current 5 A
- Continuous current with AC, maximum permissible	5 A
- Apparent power consumption per phase for measuring range 5 A	0.6 VA
- Rated value short-time withstand current restricted to 1 s	100 A

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Technical specifications (continued)

Article number	6AG1134-6PA01-7BU0 SIPLUS ET 200SP AI EM CT ST
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal
- Surge strength	10 A; for 1 minute
- Zero point suppression	0 ... 20%, referred to the nominal current
- Accuracy class according to IEC 61557-12	
- Measured variable voltage	0,2
- Measured variable current	0,2
- Measured variable apparent power	0.5
- Measured variable active power	0.5
- Measured variable reactive power	1
- Measured variable power factor	0.5
- Measured variable active energy	0.5
- Measured variable reactive energy	1
- Measured variable neutral current	0,2
- Measured variable phase angle	±0.5 °; not covered by IEC 61557-12
- Measured variable frequency	0.05; only valid for the permissible voltage measuring range
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	

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Technical specifications (continued)

Article number	6AG1134-6PA01-7BU0 SIPLUS ET 200SP AI EM CT ST
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g
Other	
Data for selecting a voltage transformer	
• Secondary side, max.	300 V
Data for selecting a current transformer	
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual

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Overview



- 2 and 4-channel analog output (AQ) modules

For different requirements, the analog output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - Oversampling operating mode (n-fold isochronous output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
  - Isochronous mode (simultaneous isochronous output of analog values)
  - Output of substitute value in the event of communication interruptions (shutdown, output adjustable substitute value, or keep last value)
  - Calibration during runtime
  - Re-parameterization during operation
  - Firmware update
  - Diagnostics of wire break, short-circuit, overflow, underflow
  - Value status (optional binary validity information of the analog value in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shield terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

Overview of analog output modules

Analog output	Pkg. unit	Article No.	CC code	BU type
AQ 2 x I ST	1	6AG1135-6GB00-7BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6AG1135-6HD00-7BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6AG1135-6HB00-7CA1	CC00	A0, A1
AQ 2xU/I HS With two operating modes: • High-speed isochronous AQ • Oversampling	1	6AG1135-6HB00-2DA1	CC00	A0, A1
AQ 4xI HART HF	1	6AG1135-6TD00-2CA1	CC00	A0, A1

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

SIPLUS analog output modules	
(Extended temperature range and exposure to environmental substances)	
Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit	**6AG1135-6GB00-7BA1**
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC03	**6AG1135-6HD00-7BA1**
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%	**6AG1135-6HB00-7CA1**
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16-bit, ± 0.3%	**6AG1135-6HB00-2DA1**
Analog output module AQ 4xI HART High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.3%	**6AG1135-6TD00-2CA1**
Suitable SIPLUS BaseUnits type A0	
BU15-P16+A0+2D	**6AG1193-6BP00-7DA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B	**6AG1193-6BP00-7BA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
BU15-P16+A10+2D	**6AG1193-6BP20-7DA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	**6AG1193-6BP20-7BA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	
Suitable SIPLUS BaseUnits type A1 (temperature detection)	
BU15-P16+A0+2D/T	**6AG1193-6BP00-7DA1**
(Extended temperature range and exposure to environmental substances)	
BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B/T	**6AG1193-6BP00-7BA1**
(Extended temperature range and exposure to environmental substances)	
BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
BU15-P16+A0+12D/T	**6AG1193-6BP40-7DA1**
(Extended temperature range and exposure to environmental substances)	
BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	
BU15-P16+A0+12B/T	**6AG1193-6BP40-7BA1**
(Extended temperature range and exposure to environmental substances)	
BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	

Selection and ordering data (continued)

Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19"	**6AG1193-6AB00-0AA0**
Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	
Other accessories	See SIMATIC ET 200SP, Analog output modules

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Technical specifications

Article number	6AG1135-6GB00-7BA1	6AG1135-6HD00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1	6AG1135-6TD00-2CA1
	SIPLUS ET 200SP AQ 2xI STANDARD	SIPLUS ET 200SP AQ 4xU/I ST	SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	SIPLUS ET 200SP AQ 2xU/I HF	SIPLUS ET 200SP AQ 4xI HART High Feature
General information					
Product type designation	AQ 2xI ST	AQ 4xU/I ST	AQ 2xU/I HS	AQ 2xU/I HF	AQ 4xI HART HF
Product function					
• Isochronous mode	No	No	Yes; 125 µs	Yes; 250 µs	Yes; 250 µs
• Output range scalable	No	No			
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Operating mode					
• Oversampling	No	No	Yes; 2 channels per module	No	
• MSO	No	No	No	No	
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Analog outputs					
Number of analog outputs	2	4; > +60 °C max. 2x ±10 V permissible	2	2	4
Cycle time (all channels), min.	1 ms	5 ms	125 µs	750 µs	3 ms
Analog output with oversampling	No	No	Yes		
• Values per cycle, max.			16		
• Resolution, min.			45 µs; (2 channels), 35 µs (1 channel)		
Output ranges, voltage					
• 0 to 10 V		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	
• 1 V to 5 V		Yes; 13 bit	Yes; 13 bit	Yes; 13 bit	
• -5 V to +5 V		Yes; 15 bit incl. sign	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign	
• -10 V to +10 V		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
Output ranges, current					
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	Yes; 16 bit incl. sign
• -20 mA to +20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	No
• 4 mA to 20 mA	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit	Yes; 16 bit incl. sign
Connection of actuators					
• for voltage output two-wire connection		Yes	Yes	Yes	
• for voltage output four-wire connection		Yes	Yes	Yes	
• for current output two-wire connection	Yes	Yes	Yes	Yes	Yes
Load impedance (in rated range of output)					
• with voltage outputs, min.		2 kΩ	2 kΩ	2 kΩ	
• with voltage outputs, capacitive load, max.		1 µF	1 µF	1 µF	
• with current outputs, max.	500 Ω	500 Ω	500 Ω	500 Ω	750 Ω
• with current outputs, inductive load, max.	1 mH	1 mH	1 mH	1 mH	10 mH
Cable length					
• shielded, max.	1 000 m	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output	800 m
Analog value generation for the outputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
Settling time					

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Technical specifications (continued)

Article number	6AG1135-6GB00-7BA1	6AG1135-6HD00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1	6AG1135-6TD00-2CA1
	SIPLUS ET 200SP AQ 2xI STANDARD	SIPLUS ET 200SP AQ 4xU/I ST	SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	SIPLUS ET 200SP AQ 2xU/I HF	SIPLUS ET 200SP AQ 4xI HART High Feature
• for resistive load	0.1 ms; Typical value	0.1 ms	0.05 ms	0.05 ms	2 ms; 750 ohm
• for capacitive load		1 ms	0.05 ms; Max. 47 nF and 20 m cable length	0.05 ms; Max. 47 nF and 20 m cable length	2 ms
• for inductive load	0.5 ms	0.5 ms	0.05 ms	0.05 ms	2 ms
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %	0.1 %	0.1 %	
• Current, relative to output range, (+/-)	0.3 %	0.3 %	0.1 %	0.1 %	0.1 %
Protocols					
HART protocol					Yes
Isochronous mode					
Execution and activation time (TCO), min.			70 µs	500 µs	
Bus cycle time (TDP), min.			125 µs	750 µs	
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes; module-wise
• Wire break	Yes	Yes; module-by-module, only for output type "current"	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"	Yes; channel by channel
• short-circuit		Yes; module-by-module, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"	Yes
• Group error	Yes	Yes	Yes	Yes	
• Overflow/Underflow	Yes; module-wise	Yes; module-wise	Yes	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. 2x ±10 V permissible	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA-0) or configured slots to the left and right of the module	70 °C; = Tmax	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA-0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level					

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Technical specifications (continued)

Article number	6AG1135-6GB00-7BA1	6AG1135-6HD00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1	6AG1135-6TD00-2CA1
	SIPLUS ET 200SP AQ 2xI STANDARD	SIPLUS ET 200SP AQ 4xU/I ST	SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	SIPLUS ET 200SP AQ 2xU/I HF	SIPLUS ET 200SP AQ 4xI HART High Feature
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance					
- Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0//6AG1193-6AB00-0A-A0)
- Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA-0/6AG1193-6AB00-0A-A0)

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Technical specifications (continued)

Article number	6AG1135-6GB00-7BA1	6AG1135-6HD00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1	6AG1135-6TD00-2CA1
	SIPLUS ET 200SP AQ 2xI STANDARD	SIPLUS ET 200SP AQ 4xU/I ST	SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	SIPLUS ET 200SP AQ 2xU/I HF	SIPLUS ET 200SP AQ 4xI HART High Feature
- Usage in industrial process technology					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	31 g

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Overview



Technical properties

- Counter module for ET 200SP
- Interfaces:
  - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
  - 24 V encoder supply output, short-circuit-proof
  - 3 digital inputs for controlling the count operation, for saving or for setting the count value
  - 2 digital outputs for fast reactions regardless of the counter status or measured value
- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at encoder and digital inputs

Supported types of encoders/signals

- 24 V incremental encoder with and without signal N
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Selection and ordering data

TM Count 1x24V counter module With one channel, max. 200 kHz; for 24 V encoder	
• Pack of 1 unit	**6ES7138-6AA01-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7138-6AA01-2BA0**
Suitable BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**

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Selection and ordering data (continued)

• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**
Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
General information	
Product type designation	TM Count 1x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15 SP1 or higher
• STEP 7 configurable/integrated from version	V5.6 and higher
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	3
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
• Probe	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	

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Technical specifications (continued)

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	1 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Interface types	
• Sourcing/sinking input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator forward counting (green)	Yes
• Status indicator backward counting (green)	Yes

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Technical specifications (continued)

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes

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Technical specifications (continued)

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Overview



Technical properties

- Counter and position detection module for ET 200SP
- Interfaces:
  - Encoder signals A, B and N for 5 V TTL or RS422 differential signals
  - SSI interface with clock and data for RS422 differential signals
  - 24 V encoder supply, short-circuit-proof
  - 5 V encoder supply, short-circuit-proof
  - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
  - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counting frequency 1 MHz (4 MHz with fourfold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at encoder and digital inputs

Supported types of encoders/signals

- Incremental encoders with and without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Selection and ordering data

TM PosInput 1 counter and position detection module With one channel, max. 1 MHz for 5 V TTL or RS422 differential signals or SSI absolute encoder	
• Pack of 1 unit	**6ES7138-6BA01-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7138-6BA01-2BA0**
Suitable BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**

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Selection and ordering data (continued)

• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**
Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
General information	
Product type designation	TM PosInput 1
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher
• STEP 7 configurable/integrated from version	V5.6 (use previous version *6BA00*)
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	2
5 V encoder supply	
• 5 V	Yes
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA; Total current of all encoders
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA; Total current of all encoders
Digital inputs	
Number of digital inputs	2
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	

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Technical specifications (continued)

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	1 A
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes

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Technical specifications (continued)

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator forward counting (green)	Yes
• Status indicator backward counting (green)	Yes
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s

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Technical specifications (continued)

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with µs accuracy
- Outputs for outputting switching signals with µs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

Selection and ordering data

TM Timer DIDQ 10x24V time-based IO module	
4 time-controlled inputs, 6 time-controlled outputs	**6ES7138-6CG01-0BA0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC20-1AM0**
5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	
Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**

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Technical specifications

Article number	6ES7138-6CG01-0BA0 ET 200SP, TM Timer DIDQ 10x24V
General information	
Product type designation	TM Timer DIDQ 10x24V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V21 or higher
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; 1L+ (-0.8V)
• Short-circuit protection	Yes
• Output current, max.	500 mA; Observe derating
Digital inputs	
Number of digital inputs	4
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Digital input with time stamp	Yes
• Counter	Yes
• Counter for incremental encoder	Yes
• Digital input with oversampling	Yes
• HW enable for digital input	Yes
• HW enable for digital output	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
- for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	6
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Digital output functions, parameterizable	
• Digital output with time stamp	Yes
• PWM output	Yes
- Number, max.	6
• Digital output with oversampling	Yes
Switching capacity of the outputs	

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Technical specifications (continued)

Article number	6ES7138-6CG01-0BA0 ET 200SP, TM Timer DIDQ 10x24V
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; 1L+ (-0.8V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
Switching frequency	
• with resistive load, max.	10 kHz
Total current of the outputs	
• Current per module, max.	3.5 A
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• pulse encoder	Yes
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	Yes
• Number of counters	3
• Counting frequency, max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes

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Technical specifications (continued)

Article number	6ES7138-6CG01-0BA0 ET 200SP, TM Timer DIDQ 10x24V
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Decentralized operation	
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Overview



2-channel pulse output module for ET 200SP

- Operating modes:
  - Single pulse with defined length
  - Pulse chain with defined number of pulses
  - Pulse width modulation (with flexible ON period, optional current control and dither function)
  - PWM signal for controlling a DC motor
  - ON and OFF delay; rising and falling edge can be delayed separately to the microsecond
  - Frequency output with defined output frequency
- Hardware:
  - 2 channels 24 V, 2 A output current
  - Parallel switching for enhanced performance on 4 A output current
  - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
  - Push/pull output driver for especially steep edges at the outputs
  - Polarity change in DC motor operation for direction reversal
  - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 µs
- Channel functions:
  - HW enable;
    start of signal output with the onboard digital input
  - Parameterizable ON delay;
    for precise deceleration between the HW enable and the start of output
  - Current measurement in the operating modes pulse width modulation and pulse chain;
    enables control of the output current mean value over a period. This allows you to compensate for the effect of temperature on the actuator resistance.
  - Cyclic control of the respective main setpoint from the PLC in every operating mode;
    other values can be modified flexibly from the user program.

Overview (continued)

- Supported system functions:
  - Isochronous mode;
    enables precision-timed connection of the setpoint output to a higher-level controller
  - Firmware update
  - Identification data I&M

Selection and ordering data

TM Pulse 2x24V pulse output module	
PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors	**6ES7138-6DB00-0BB1**
Suitable BaseUnits	
BU20-P12+A0+4B	**6ES7193-6BP20-0BB1**
BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group	
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
General information	
Product type designation	TM Pulse 2x24 V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 + HSP
• STEP 7 configurable/integrated from version	V5.5 SP4 and higher
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.31
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	2; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	2; 1 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Freely usable digital input	Yes
• HW enable for digital output	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Type of digital output	P- and M-switching
Number of digital outputs	2; 1 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Freely usable digital output	Yes
• PWM output	Yes
- Number, max.	2; 1 per channel
• Connection of a proportional valve	Yes
• Dithering	Yes
• Current measurement	Yes

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Technical specifications (continued)

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
• Current control	Yes
• Connection of a DC motor	Yes
• ON-delay	Yes
• OFF-delay	Yes
• Frequency output	Yes
• Pulse train	Yes
• Pulse output	Yes
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W; 1 W with High Speed output
Load resistance range	
• lower limit	12 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	2 A; 0.1 A with High Speed output, observe derating
Output delay with resistive load	
• "0" to "1", typ.	0 µs; With High Speed output, 4.5 µs with Standard output
• "0" to "1", max.	0.8 µs; With High Speed output, 9 µs with Standard output
• "1" to "0", typ.	0 µs; With High Speed output, 4.5 µs with Standard output
• "1" to "0", max.	0.8 µs; With High Speed output, 9 µs with Standard output
Parallel switching of two outputs	
• for uprating	Yes
Switching frequency	
• with resistive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• with inductive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
• Current per group, max.	4 A
• Current per module, max.	4 A
Isochronous mode	
Bus cycle time (TDP), min.	250 µs; with 1 channel configuration, 375 µs with 2 channel configuration
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	No
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

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Technical specifications (continued)

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	50 g

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Overview



- 2-channel interface module in ET 200SP for PTO (Pulse Train Output)
- Signal interface for speed and direction: 24 V asymmetrical up to 200 kHz
- 3 signal types can be configured:
  - **PTO pulse/direction**:
    The pulse signal defines the speed and distance and the direction signal determines the direction.
  - **PTO count up/ count down**:
    A signal defines the pulses in the forward direction and the other signal defines the pulses in the reverse direction.
  - **PTO A/B phase-shifted**:
    2 tracks are output, whose signals are phase-shifted by 90°. Based on the signal sequence, the direction, the distance and the speed can be determined. It can be selected whether a full period lasts for 1 increment or whether all 4 edge transitions will be counted.
- The pulses output are also counted internally in the module and signaled to the CPU as the current actual position.
- Supported technology objects:
  - Speed axis (S7-1500, S7-1500T)
  - Positioning axis (S7-1200, S7-1500, S7-1500T)
  - Synchronous axis (S7-1500, S7-1500T)
  - Probe (S7-1500, S7-1500T)

Selection and ordering data

TM PTO 2x24V interface module for PTO (Pulse Train Output) With two channels for Pulse Train Output PTO, 24 V; 2 DQ PTO, 3 DI 24 V and 1 DQ 24 V per channel	**6ES7138-6EB00-0BA0**
Suitable BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 … 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1 … 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**

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Selection and ordering data (continued)

• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7138-6EB00-0BA0 ET 200SP, TM PTO 2x24V
General information	
Product type designation	TM PTO 2x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 with HSP or higher
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.35
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	6; 3 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Synchronization	Yes
• Probe	Yes
• Drive ready	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Number of digital outputs	6; 3 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Controlling a digital input	Yes
Digital output functions, parameterizable	
• PTO (pulse train output) signal interface	Yes
- 24 V asymmetrical	Yes
• PTO (pulse train output) signal type	
- Pulse and direction	Yes
- Count up, count down	Yes
- Incremental encoder (A, B phase shift)	Yes
- Incremental encoder (A, B phase shift, quadruple)	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.1 A; 0.5 A for CHn.ED
• on lamp load, max.	1 W; 5 W for CHn.ED
Load resistance range	
• lower limit	240 Ω; 48 ohms for CHn.ED
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-1.3 V), L+ (-0.8 V) for CHn.ED
Output current	

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Technical specifications (continued)

Article number	6ES7138-6EB00-0BA0 ET 200SP, TM PTO 2x24V
• for signal "1" rated value	0.1 A; 0.5 A for CHn.ED
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz
• For signal interface 24 V asymmetrical	200 kHz; For 24 V PTO outputs
Total current of the outputs	
• Current per module, max.	1.4 A
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Decentralized operation	
to SIMATIC S7-300	Yes; Via control and feedback interface
to SIMATIC S7-400	Yes; Via control and feedback interface
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes; Via control and feedback interface
to standard PROFINET controller	Yes; Via control and feedback interface
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Overview



The TM StepDrive module from Phytron is a high-precision stepper motor control with integrated power output stage for use in the SIMATIC ET 200SP distributed I/O system. It is the 1-step-drive successor model for SIMATIC ET 200S.

The module can be used together with system and I/O components of the ET 200SP distributed I/O system. Operation is possible with the following head modules:

- IM PROFIBUS
- IM PROFINET
- ET 200SP CPU

Corresponding GSD files and an HSP are available.

The ET 200SP TM StepDrive 24...48V/5A is a product of our Phytron GmbH product partner and is only available from the Phytron GmbH company.

Note

Product partners are external companies outside Siemens AG and its associated companies. Information and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the respective product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners.

Selection and ordering data

TM StepDrive stepper motor control High-precision stepper motor control for ET 200SP	More information and ordering options via Phytron under this link.
Suitable BaseUnits	
BU20-P12+A0+4B BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group	**6ES7193-6BP20-0BB1**
Accessories	
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

Technical specifications

- Suitable for bipolar control of 2-phase stepper motors of 4-, (6-) or 8-wire design (in 4-wire system)
- 5 A peak phase current with adjustable current steps
- Supply voltage from 24 to 48 V DC
- Up to 1/256 micro step (physical resolution: approx. 51 200 positions per revolution (0.007°/step)).
- Maximum stepping rate: 250 000 steps/s
- 2 digital inputs for limit and reference switches
- Diagnostics LEDs (overcurrent, overtemperature, traversing task or motor running ...)
- Short-circuit-proof, overload-proof
- Data record transfer for power output stage parameter assignment and diagnostics during runtime
- Booster: Enhanced torque during acceleration or braking
- Adjustable response to CPU stop

More information

You can find more information on the module and associated contact information on the internet under this link.

Here you will also find the manual, the data sheet, the HSP, a link to the GSD files as well as sample function blocks for SIMATIC.

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Overview



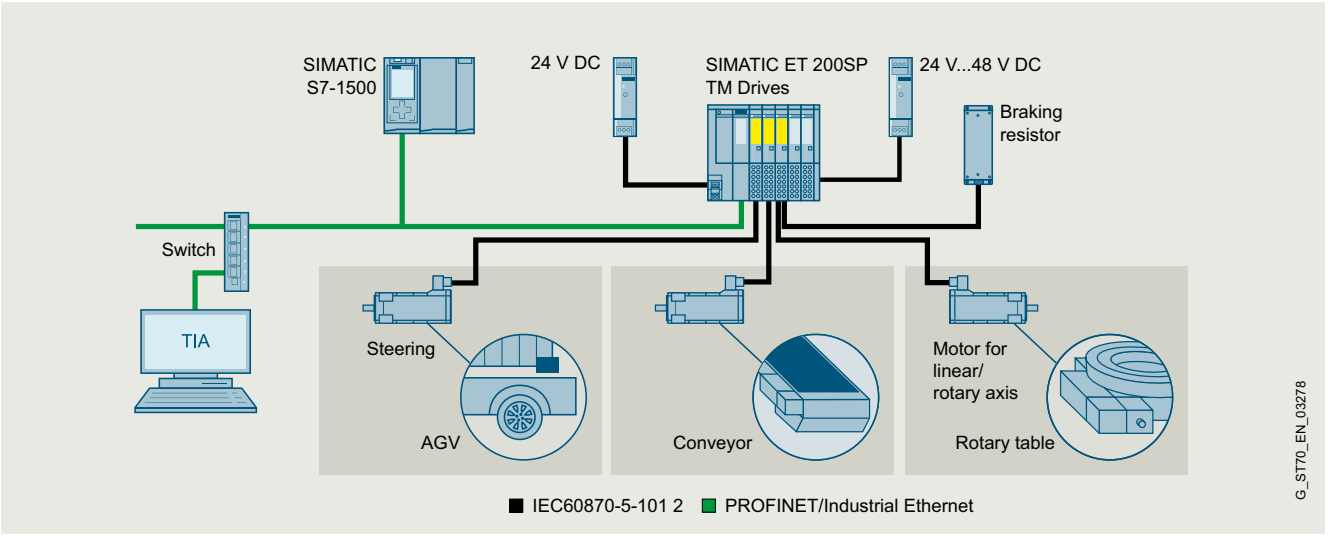
In combination with EC Motors and stepper motors up to 280 W the ET 200SP technology module F-TM ServoDrive HF allows positioning and speed control in very confined spaces. The triple overload capability and the support of BiSS-C multi-turn encoders extend the scope of applications of the TM Drive product family.

Engineering in the TIA Portal stands for consistency in a single tool. This facilitates drive dimensioning, commissioning and servicing.

The new drive system consists of:

- The F-TM ServoDrive HF,
- The BaseUnit (U0),
- Motors with gearbox for flexible use and
- Connecting cables.

Further information on the distributed I/O system SIMATIC ET 200SP is available in the ST 70 Catalog and on the internet at www.siemens.com/et200sp



Application example TM Drives

Characteristics

- PROFINET RT/IRT from firmware FW2.1
- Hardware-STO (SIL 3)
- Triple overload
- Digital input
- Integrated braking chopper
- Encoder connection for
  - IQ encoders
  - Incremental encoders
  - BiSS-C encoders
  - Hall encoder

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Overview (continued)

Variant	Power	Peak power	Device width
High Feature	280 W	840 W	20 mm

More information:
www.siemens.com/micro-drive

Selection and ordering data

F-TM ServoDrive HF for SIMATIC MICRO-DRIVE	
Variant	Article No.
• High Feature V1; 24 ... 48 V, 5 A with hardware STO and integrated braking chopper	**6BK1136-6AB01-0CU0**

Accessories

Description	Article No.
ET 200SP BaseUnit type U0	
• For constructing a new potential group (white)	**6ES7193-6BP00-0DU0**
• For continuing an existing potential group (gray)	**6ES7193-6BP00-0BU0**
Shield connection for ET 200SP Includes 5 shield connections	**6ES7193-6SC20-1AM0**

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Technical specifications

Article number	6BK1136-6AB01-0CU0 F-TM ServoDrive HF
General information	
Product type designation	F-TM ServoDrive HF
Product description	control of EC and stepper motors
Product function	
• I&M data	Yes
• Isochronous mode	Yes
• Four-quadrant operation	Yes
• Speed control with encoder	Yes
• Speed control without encoder	No
• Safety Functions	Yes; Drive controller with hardwired STO
Protection function	
• Undervoltage protection	Yes
• Overvoltage protection	Yes
• Overload protection	Yes
• Ground-fault protection	No
• Short-circuit protection	Yes
Installation type/mounting	
Type of ventilation	Convection cooling
Supply voltage	
Design of the power supply	24 ... 48 V DC, SELV / PELV
output voltage / header	
Rated value, min.	24 V
Rated value, max.	48 V
Output current	
Current output (rated value)	5 A
Output current, max.	15 A
Output frequency	599 Hz; 1 500 Hz with stepper motors
Encoder supply	
Number of outputs	1
5 V encoder supply	
• 5 V	Yes
• Short-circuit protection	Yes
• Output current, max.	150 mA
Digital inputs	
Number of digital inputs	1; input for message signal
Number of safety inputs	1; For STO, antivalent (2-pin) - 24 V DC
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; up to 500 Hz per channel
• Absolute encoder (SSI)	Yes; BiSS-C
• Hall encoder	Yes
• BiSS-C encoder	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Telegram error at SSI encoder	Yes; BiSS-C
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes

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Technical specifications (continued)

Article number	6BK1136-6AB01-0CU0 F-TM ServoDrive HF
Integrated Functions	
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
China RoHS compliance	Yes
Standard for EMC according to EN 61800-3	Yes
Standard for drive acc. to EN 61800-5-1	Yes
Standard for drive acc. to EN 61800-5-2	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Category 3, performance level d, according to EN ISO 13849-1:2015
• SIL acc. to IEC 61508	SIL 3
• SIL according to DIN EN 61800-5-2	SIL 3
Ambient conditions	
Pollution degree during storage and transport	2
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• horizontal installation, max.	60 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
• vertical installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• vertical installation, max.	50 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
Ambient temperature during storage/transportation	
• Storage, min.	-30 °C
• Storage, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m
Cables	
Cable length for motor, shielded, max.	10 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g
Other	
Brake design	holding brake control via the process image
Braking chopper	Yes

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Overview



SIMATIC MICRO-DRIVE F-TM ServoDrive ST Video



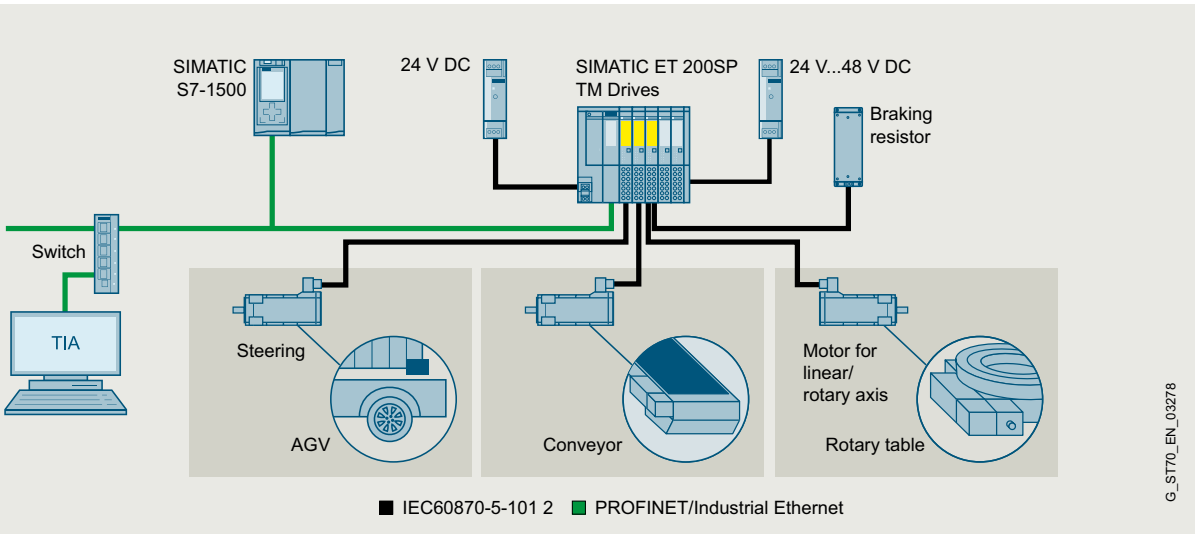
In combination with EC motors, the ET 200SP technology module F-TM ServoDrive ST allows positioning and speed control of EC motors up to 280 W in very confined spaces.

Engineering in the TIA Portal stands for consistency in a single tool. This facilitates drive dimensioning, commissioning and servicing.

The new drive system consists of

- The F-TM ServoDrive ST
- The BaseUnit (U0)
- Motors with gearbox for flexible use and
- Connecting cables.

Further information on the distributed I/O system SIMATIC ET 200SP is available in the ST 70 Catalog and on the internet at www.siemens.com/et200sp



Application example TM Drives

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Overview (continued)

Characteristics

- PROFINET RT/IRT from firmware FW2.1
- Hardware STO (SIL 2)
- Double overload
- Digital input
- Integrated braking chopper
- Encoder connection for
  - IQ encoders
  - Incremental encoders
  - Hall encoder

Variant	Power	Device width
Standard	280 W	20 mm

More information:
siemens.com/micro-drive

Selection and ordering data

F-TM ServoDrive ST for SIMATIC MICRO-DRIVE	
Variant	Article No.
• Standard V1; 24 ... 48 V, 5 A with hardware STO and integrated braking chopper	**6BK1136-6AB01-0BU0**

Accessories

Description	Article No.
SIMATIC F-TM ServoDrive ST Starter Kit Scope of supply: • SIMATIC MICRO-DRIVE F-TM ServoDrive ST • SIMATIC ET 200SP PROFINET IM 155-6PN ST Interface Module • SIMATIC ET 200SP BaseUnit type U0 • All-in-one plug-in cable CSD_LAiO2, length 1.5 m • SIMOTICS E extra low-voltage motor 1EE1122, 24 V	**6BK1637-6AB00-0BU0**
ET 200SP BaseUnit type U0 • For constructing a new potential group (white)	**6ES7193-6BP00-0DU0**
• For continuing an existing potential group (gray)	**6ES7193-6BP00-0BU0**
Shield connection for ET 200SP Includes 5 shield connections	**6ES7193-6SC20-1AM0**

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Technical specifications

Article number	6BK1136-6AB01-0BU0 F-TM ServoDrive ST
General information	
Product type designation	F-TM ServoDrive ST
Product description	Control of EC motors
Product function	
• I&M data	Yes
• Isochronous mode	Yes
• Four-quadrant operation	Yes
• Speed control with encoder	Yes
• Speed control without encoder	No
• Safety Functions	Yes; Drive controller with hardwired STO
Protection function	
• Undervoltage protection	Yes
• Overvoltage protection	Yes
• Overload protection	Yes
• Ground-fault protection	No
• Short-circuit protection	Yes
Installation type/mounting	
Type of ventilation	Convection cooling
Supply voltage	
Design of the power supply	24 ... 48 V DC, SELV / PELV
output voltage / header	
Rated value, min.	24 V
Rated value, max.	48 V
Output current	
Current output (rated value)	5 A
Output current, max.	10 A
Output frequency	599 Hz
Encoder supply	
Number of outputs	1
5 V encoder supply	
• 5 V	Yes
• Short-circuit protection	Yes
• Output current, max.	150 mA
Digital inputs	
Number of digital inputs	1; input for message signal
Number of safety inputs	1; For STO, antivalent (2-pin) - 24 V DC
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; up to 500 Hz per channel
• Hall encoder	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
Integrated Functions	
Position detection	
• Incremental acquisition	Yes

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Technical specifications (continued)

Article number	6BK1136-6AB01-0BU0 F-TM ServoDrive ST
• Absolute acquisition	No
• Suitable for S7-1500 Motion Control	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
China RoHS compliance	Yes
Standard for EMC according to EN 61800-3	Yes
Standard for drive acc. to EN 61800-5-1	Yes
Standard for drive acc. to EN 61800-5-2	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Category 3, performance level d, according to EN ISO 13849-1:2015
• SIL acc. to IEC 61508	SIL 3
• SIL according to DIN EN 61800-5-2	SIL 3
Ambient conditions	
Pollution degree during storage and transport	2
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• horizontal installation, max.	60 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
• vertical installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• vertical installation, max.	50 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
Ambient temperature during storage/transportation	
• Storage, min.	-30 °C
• Storage, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m
Cables	
Cable length for motor, shielded, max.	10 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g
Other	
Brake design	holding brake control via the process image
Braking chopper	Yes

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Overview



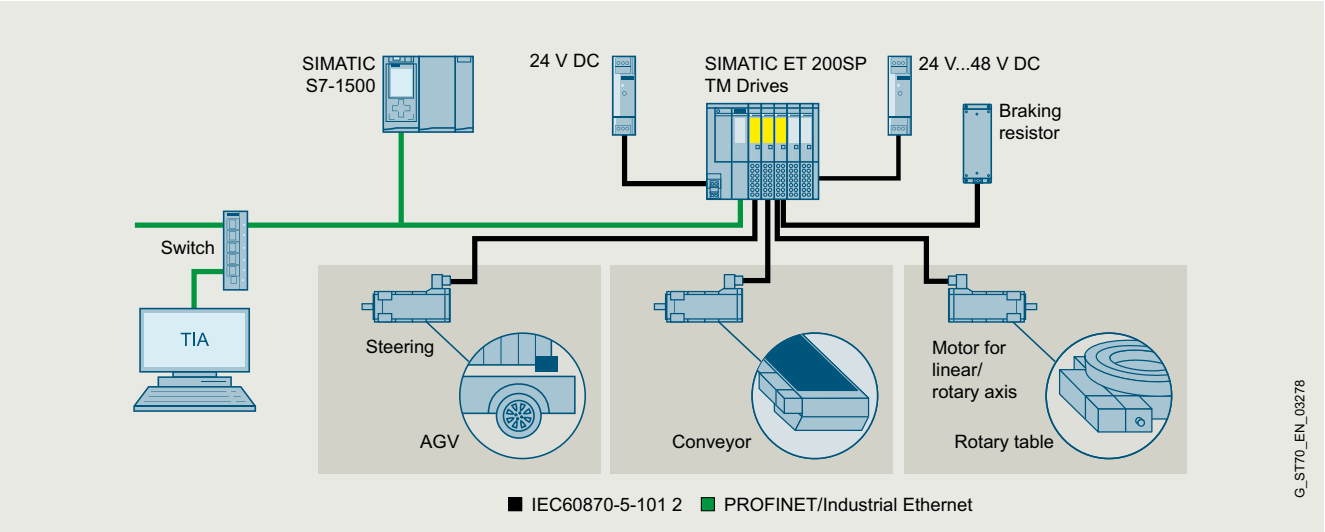
The ET 200SP technology module F-TM StepDrive ST allows positioning and speed control of stepper motors up to 10 A peak current in very confined spaces.

Engineering in the TIA Portal stands for consistency in a single tool. This facilitates drive dimensioning, commissioning and servicing.

The new drive system consists of

- The F-TM StepDrive ST,
- The BaseUnit (U0)

Further information on the distributed I/O system SIMATIC ET 200SP is available in the ST 70 Catalog and on the internet at www.siemens.com/et200sp



Application example TM Drives

Characteristics

- Bipolar stepper motors
- PROFINET RT/IRT from firmware FW2.1
- Hardware STO (SIL3)
- Digital input
- Encoderless open-loop controlled operation
- Closed-loop operation with encoder feedback
- Encoder connection for
  - Incremental encoders

Variant	Power	Device width
Standard	280 W	20 mm

More information:
siemens.com/micro-drive

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Selection and ordering data

F-TM StepDrive ST for SIMATIC MICRO-DRIVE	
Variant	Article No.
• Standard V1; 24 ... 48 V, 5 A with hardware STO	**6BK1136-6SB01-0BU0**

Accessories

Description	Article No.
ET 200SP BaseUnit type U0	
• For constructing a new potential group (white)	**6ES7193-6BP00-0DU0**
• For continuing an existing potential group (gray)	**6ES7193-6BP00-0BU0**
Shield connection for ET 200SP Includes 5 shield connections	**6ES7193-6SC20-1AM0**

Technical specifications

Article number	6BK1136-6SB01-0BU0 F-TM StepDrive ST
General information	
Product type designation	F-TM StepDrive ST
Product description	control of stepper motors
Product function	
• I&M data	Yes
• Isochronous mode	Yes
• Four-quadrant operation	Yes
• Speed control with encoder	Yes
• Speed control without encoder	No
• Safety Functions	Yes; Drive controller with hardwired STO
Protection function	
• Undervoltage protection	Yes
• Overvoltage protection	Yes
• Overload protection	Yes
• Ground-fault protection	No
• Short-circuit protection	Yes
Installation type/mounting	
Type of ventilation	Convection cooling
Supply voltage	
Design of the power supply	24 ... 48 V DC, SELV / PELV
output voltage / header	
Rated value, min.	24 V
Rated value, max.	48 V
Output current	
Current output (rated value)	5 A
Output current, max.	10 A
Output frequency	1 500 Hz
Encoder supply	
Number of outputs	1
5 V encoder supply	
• 5 V	Yes
• Short-circuit protection	Yes
• Output current, max.	150 mA
Digital inputs	
Number of digital inputs	1; input for message signal
Number of safety inputs	1; For STO, antivalent (2-pin) - 24 V DC
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; up to 500 Hz per channel
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes

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Technical specifications (continued)

Article number	6BK1136-6SB01-0BU0 F-TM StepDrive ST
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
Integrated Functions	
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	No
• Suitable for S7-1500 Motion Control	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
China RoHS compliance	Yes
Standard for EMC according to EN 61800-3	Yes
Standard for drive acc. to EN 61800-5-1	Yes
Standard for drive acc. to EN 61800-5-2	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Category 3, performance level d, according to EN ISO 13849-1:2015
• SIL acc. to IEC 61508	SIL 3
• SIL according to DIN EN 61800-5-2	SIL 3
Ambient conditions	
Pollution degree during storage and transport	2
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• horizontal installation, max.	60 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
• vertical installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• vertical installation, max.	50 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
Ambient temperature during storage/transportation	
• Storage, min.	-30 °C
• Storage, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m
Cables	
Cable length for motor, shielded, max.	10 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g

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Technical specifications (continued)

Article number	6BK1136-6SB01-0BU0 F-TM StepDrive ST
Other	
Brake design	holding brake control via the process image
Braking chopper	No

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Overview

Discontinuation of the SIMATIC ET 200SP ECC charging controllers

To support the continued development of our product portfolio and to comply with increasing regulatory requirements, including the AFIR (Alternative Fuels Infrastructure Regulation) and the ISO 15118-20 standard, Siemens will discontinue the SIMATIC ET 200SP ECC charging controllers (6FE1242-6TM10-0BB1, 6FE1242-6TM20-0BB1), the Expansion kit (6FE1244-0AD10-0AA0) and SIPLUS ET 200SP ECC charging controller (6AG1242-6TM10-2BB1) effective August 1, 2026. The product will be fully phased out and removed from the portfolio on December 31, 2026.
A functionally equivalent replacement is available from our technology and product partner, **EcoG**. Details can be found via the following link.
For further information, please refer to the following link.

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Overview



SIWAREX WP321 is a versatile and flexible weigh beam for the seamless integration of a static scale into the SIMATIC automation environment.

The weighing electronics are integrated within the SIMATIC ET 200SP system series and use all the features of a modern automation system, such as integrated communication, operator control and monitoring, diagnostics units and the project planning tools in the TIA portal, SIMATIC Step 7, WinCC flexible and PCS 7.

In conjunction with the digital SIWAREX DB junction box, up to four connected load cells can be diagnosed separately. This enables the weigh beam module to detect the failure of individual load cells and, in the event of an error, to provide relevant load cell data such as order number and location designation directly in the CPU or at the HMI. This increases the operational reliability of the scale, reduces downtimes, makes commissioning easier and simplifies servicing.

All messages and process values of the individual load cell channels are of course available in the SIMATIC controller.

Selection and ordering data

	Article No.
TM SIWAREX WP321 weighing electronics Single-channel, for platform scales or hopper scales with analog load cells (1 ... 4 mV/V), 1 × LC, 1 × RS 485	**7MH4138-6AA00-0BA0**
SIWAREX WP321 Equipment Manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWAREX WP321 "Ready-for-use" TIA Portal and SIMATIC Manager sample configuration Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
SIWAREX PCS 7 AddOn Library for PCS7 V8.x and V9.0 Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scale) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (Loss-in-weight)	**7MH4900-1AK61**
Accessories (mandatory requirement)	
BaseUnit (Type A0 – one BaseUnit required for each WP321) For opening a new potential group	
• BU15P-16+A0+2D	**6ES7193-6BP00-0DA0**
• BU15P-16+A10+2D	**6ES7193-6BP20-0DA0**
For continuing the potential group	
• BU15P-16+A0+2B	**6ES7193-6BP00-0BA0**
• BU15P-16+A10+2B	**6ES7193-6BP20-0BA0**
Shield connection for BaseUnit (5 units / for 5 scales) For laying load cell cable	**6ES7193-6SC20-1AM0**
Accessories (optional)	
SIWAREX EB extension box For extending sensor cables	**7MH4710-2AA**
SIWAREX JB junction box, aluminum enclosure For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel enclosure For connecting up to 4 load cells in parallel	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel enclosure (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	**7MH5001-0AA01**
SIWAREX DB digital junction box For enhanced diagnostic and monitoring options in conjunction with SIWAREX WP electronics Enclosure made of:	
• Aluminum	**7MH5001-0AD20**
• Stainless steel	**7MH5001-0AD01**
SIWAREX IS Ex interface For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. Approved for use in the EU	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**

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Selection and ordering data (continued)

	Article No.
• Short-circuit current < 137 mA DC	7MH4710-5CA
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	7MH4702-8AG
• Sheath color (for hazardous atmospheres): blue	7MH4702-8AF
RS 485/USB interface converter Commercially available interface converter with FTDI chip, e.g. USB-Nano from CTI https://www.cti-shop.com/en/rs485-converter/usb-nano-485	
Remote display The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX WP321 via an RS 485 interface. **Siebert Industrieelektronik GmbH** **PO Box 1180D-65565 Eppelborn, Germany** **Tel: +49 6806/980-9** **Fax: +49 6806/980-999** http://www.siebert-group.com/en Detailed information is available from the manufacturer.	

Technical specifications

SIWAREX WP321	
Integration in automation systems	
SIMATIC S7-300, S7-400, S7-1200 and S7-1500	Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)
Other manufacturers (with restrictions)	Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)
Communication interfaces	• SIMATIC ET 200SP backplane bus • RS 485 (SIWATOOL, Siebert remote display)
Commissioning options	• Using SIWATOOL V7 • Using function block in SIMATIC CPU / Touch Panel
Measuring accuracy	
According to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	± 2 million parts
Measuring frequency	100 / 120 / 600 Hz
Digital filter	Variable adjustable low-pass and average filter
Typical applications	• Non-automatic weighing instruments • Force measurements • Fill-level monitoring • Belt tension monitors
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 × min/max • Empty
Zeroing	Via command by controller or HMI
Tare	Via command by controller or HMI
External tare specification	Via command by controller or HMI
Calibration commands	Via command by controller or HMI
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (value applies at sensor, cable-related voltage drops of up to 5 V are controlled)	4.85 V DC ±2%
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 ... 4 mV/V
Permissible range of measuring signal (at greatest set characteristic value)	-21.3 ... +21.3 mV
Max. distance of load cells	1000 m (459.32 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals/certificates	• ATEX Zone 2 • UL • FM • EAC • KCC • IECEx • RCM
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	Typ. 0.1 A @ 24 V DC (0.2 A max.)
Max. power consumption SIMATIC Bus	30 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements $T_{min\ (IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Vertical installation in SIMATIC S7 [1]	-25 ... +50 °C (-13 ... 122 °F)
• Horizontal installation in SIMATIC S7 [1]	-25 ... +60 °C (-13 ... 140 °F)
EMC requirements	According to IEC 61000-6-2, IEC 61000-6-4, OIML R76-1

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Technical specifications (continued)

SIWAREX WP321	
Dimensions (width)	15 mm (0.6 inch)

1) The S7 standard modules may not be operated at temperatures below 0 °C (32 °F). For operating conditions below 0 °C (32 °F), SIMATIC modules from the SIPLUS series must be used.

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Overview



The SIWAREX WP341 is a compact, precise weighing electronics in the SIMATIC ET 200SP format.

With a width of just 20 mm it is one of the slimmest weighing electronics on the market, yet its firmware includes the functionalities of a continuous belt weighing electronics. Optionally the WP341 can be used for operation of solids flowmeters.

The load cells and the speed sensor are directly connected to the ET 200SP Base Unit (type U0) and therefore the complete system is directly integrated into the automation system.

Selection and ordering data

	Article No.
TM SIWAREX WP341 weighing electronics SIMATIC ET 200SP, TM SIWAREX WP341 HF, weighing electronics for continuous belt weighing applications	**7MH4138-6CA00-0CU0**
SIWAREX WP341 Equipment Manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWAREX WP341 "Getting Started" sample project Sample software shows beginners how to program the scales in TIA Portal V16 Free download on the Internet at: http://www.siemens.com/weighing/downloads	
ET 200SP BaseUnit type U0	
• For opening a new potential group (white)	**6ES7193-6BP00-0DU0**
• For continuing an existing potential group (gray)	**6ES7193-6BP00-0BU0**
Shield connection for BaseUnit (5 units/for 5 scales) For laying load cell cable	**6ES7193-6SC20-1AM0**
Accessories	
SIWAREX EB extension box For extending sensor cables	**7MH4710-2AA**
SIWAREX JB junction box, aluminum enclosure For connecting up to 4 load cells in parallel, and for connecting multiple terminal boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel enclosure For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel enclosure (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or prototype test certificate).	**7MH5001-0AA01**
SIWAREX DB digital junction box For enhanced diagnostic and monitoring options in conjunction with SIWAREX WP electronics. Enclosure made of:	
• Aluminum	**7MH5001-0AD20**
• Stainless steel incl. ATEX and IECEx approval II 3 G Ex ec IIC T4 Gc and II 3 D Ex tc IIIC T120 °C Dc	**7MH5001-0AD01**
SIWAREX IS Ex interface For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX weighing electronics. Compatibility of load cells must be checked separately.	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• Sheath color (for hazardous atmospheres): blue	**7MH4702-8AF**

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Technical specifications

Article number	7MH4138-6CA00-0CU0
General information	
Product type designation	TM SIWAREX WP341 HF
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Adjustment of measuring range	Yes; ±0 ... 4 mV/V
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V16
• STEP 7 configurable/integrated from version	- / -
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	3
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Input voltage	
• Type of input voltage	24 V DC
• Rated value (DC)	24 V
• for signal "0"	< 5 V DC
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	1.6 mA
Input delay (for rated value of input voltage)	
- for technological functions	
- Parameterizable	Yes
Digital outputs	
Number of digital outputs	3
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
Digital output functions, parameterizable	
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
Output voltage	
• Type of output voltage	DC
Output delay with resistive load	
• "0" to "1", typ.	20 µs
• "1" to "0", typ.	30 µs
Parallel switching of two outputs	
• for uprating	No
Switching frequency	
• with resistive load, max.	500 Hz

Technical specifications (continued)

Article number	7MH4138-6CA00-0CU0
Total current of the outputs	
• Current per channel, max.	0.5 A; the total current of all outputs ≥ 0.6 A, the ambient temperature is reduced by -1 °C per 100 mA
• Current per module, max.	1.5 A; Observe derating
Encoder	
Connection of signal encoders	
• For strain gauges (full bridges) with 4-conductor connection	Yes
• For strain gauges (full bridges) with 6-conductor connection	Yes
• Resistance of full bridge, min.	56 Ω; when using SIWAREX IS 87 ohm for 7MH4710-5BA; 180 ohm when using 7MH4710-5CA
• Resistance of full bridge, max.	4 100 Ω
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.001 %
Error limit according to DIN 1319-1	0.002 %; of full-scale value
Accuracy class	III
Temperature coefficient, zero point	≤ ±0.015 µV/K
Temperature coefficient, span	≤ ±5 ppm/K
1. Interface	
Interface types	
• RS 485	Yes; Terminated internally with 390 Ω / 220 Ω / 390 Ω
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; 10/100 Mbit/s
• Number of ports	1
Protocols	
• IP protocol	Yes; IPv4
• Web server	Yes
Interface types	
RJ 45 (Ethernet)	
• Autonegotiation	Yes
• Autocrossing	Yes
RS 485	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 000 m; ≤ 115 kbps, shielded cable
Protocols	
Web server	
• HTTP	Yes
• HTTPS	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Diagnostic alarm
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short-circuit	Yes
• Group error	Yes; green/red DIAG LED
Diagnostics indication LED	
• ERROR LED	Yes; green/red DIAG LED

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Technical specifications (continued)

Article number	7MH4138-6CA00-0CU0
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	8 kHz
Load cell	
• permissible input signal per verification interval, min.	0.4 µV/e
• Sampling rate	1 024 Hz
• Resolution of input signal	±20 000 000 parts at 0 ... 4 mV/V
• Common mode voltage, min.	2.8 V
• Common mode voltage, max.	7.7 V
• input resistance of signal line, typ.	8 MΩ
• input resistance of sense line, typ.	300 MΩ
• Cable length, max.	500 m; when using the SIWAREX 7MH4702-8AG cable
Measuring functions	
- Measuring range	
- -1 mV/V to +1 mV/V	Yes
- -2 mV/V to +2 mV/V	Yes
- -4 mV/V to +4 mV/V	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; more than 2 000 m above sea level, the ambient temperature is reduced by -1 °C per 100 m
• Ambient air temperature-barometric pressure-altitude	1 080 ... 533 hPa (-1 000 ... 5 000 m above sea level)
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm
Height	57 mm
Depth	72 mm
Weights	
Weight, approx.	50 g

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Overview



The SIWAREX WP351 is a compact, precise weighing module in the SIMATIC ET 200SP format.

With a width of just 20 mm it is one of the slimmest weighing modules on the market, yet its firmware includes the functionalities of an automatic totalizing weighing instrument and checking, bagging and filling scale.

All operation modes are part of the firmware and certified according to OIML R-51, R-61, R-76 and R-107. This means the WP351 can be used in both scales requiring official calibration and those that do not, where demands are high regarding speed and accuracy.

Selection and ordering data

	Article No.
TM SIWAREX WP351 HF weighing electronics SIMATIC ET 200SP, TM SIWAREX WP351 HF, legal-for-trade weighing module for automatic dosing, filling and checking scales and totalizing weighing instruments	**7MH4138-6BA00-0CU0**
SIWAREX WP351 Equipment Manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWAREX WP351 "Getting Started" sample project Sample software shows beginners how to program the scales in TIA Portal V15.1 Free download on the Internet at: http://www.siemens.com/weighing/documentation	
Calibration set SIWAREX WP351 For verification of up to 3 scales, comprising: • 3 × inscription foil for ID label • 1 × protective film • 3 × unlocking protection • 6 × screw For applications requiring official calibration, follow the calibration regulations of the country of destination.	**7MH4138-6BA00-0AY0**
ET 200SP BaseUnit type U0	
• For constructing a new potential group (white)	**6ES7193-6BP00-0DU0**
• For continuing an existing potential group (gray)	**6ES7193-6BP00-0BU0**
Shield connection for BaseUnit (5 units/for 5 scales) For laying load cell cable	**6ES7193-6SC20-1AM0**
SIWAREX EB extension box For extending sensor cables.	**7MH4710-2AA**
SIWAREX JB junction box, aluminum enclosure For connecting up to 4 load cells in parallel, and for connecting multiple terminal boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel enclosure For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel enclosure (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or prototype test certificate).	**7MH5001-0AA01**
SIWAREX IS Ex interface For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately.	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• Sheath color (for hazardous atmospheres): blue	**7MH4702-8AF**

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Technical specifications

SIWAREX WP351	
Firmware version	V1.0
• FW update possible	Yes
Usable BaseUnits	BU type U0
Reliability	
Mean time between failures (MTBF)	62 years @ TA = 40 °C
Product function	
I&M data	Yes, I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/integrated	Configurable as of V15 using HSP0281
• PROFIBUS as of GSD version/GSD revision	GSD V04.02.41
• PROFINET as of GSD version/GSD revision	GSDML V2.34
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Permissible range, low limit, static (DC)	19.2 V
• Permissible range, high limit, static (DC)	28.8 V
• Permissible range, low limit, dynamic (DC)	18.5 V
• Permissible range, high limit, dynamic (DC)	30.2 V
• Reverse polarity protection	Yes
• Non-periodic overvoltages	35 V DC for 500 ms with a recovery time of 50 s
Input current	
Current consumption, max.	Max. 140 mA @ 24 V DC + [DQ 3 × 0.5 A]
Power loss	
Typical power loss	1.7 W
Address range	
Assigned address range	
• Inputs	32 bytes
• Outputs	32 bytes
Power supply from SIMATIC S7 backplane bus	
Current consumption from ET 200SP backplane bus	Max. 27 mA @ 3.5 V (SBK4)
Analog load cell interface connection	
Error limit according to DIN 1319-1 at 20 °C (-4 °F) +/-10 K Relative accuracy (absolute accuracy can only be achieved with local calibration using calibration standards)	≤ 0.002% of end value
Measuring accuracy in accordance with OIML R76-1:2006/EN 45501:2015	
• Class	III
• Resolution (d=e)	3 × 6000 d
• Error percentage pi	0.4
• Step voltage	0.4 µV/e
Accuracy delivery state The accuracy is relevant for module exchange or theoretical adjustment	Typ. 0.1% of end value
Sampling rate	1.024 ms
Input signal resolution	± 20 000 000
Measuring ranges	0 ... ±1 mV/V 0 ... ±2 mV/V 0 ... ±4 mV/V
Common mode voltage range	+2.8 ... 7.7 V
Strain gauge supply (constant voltage)	10 V DC (+1 % / -3 %) at the EXC terminals
Short-circuit and overload protection	Yes
Connection	6-wire or 4-wire (parameterizable)
Sensor voltage monitoring	Typ. ≤ 5.0 V
Min. strain gauge input resistance per channel	
• Without SIWAREX IS Ex-i interface	56 Ω Lower impedance by means of external supply possible
• With SIWAREX IS Ex-i interface	87 Ω @ type 7MH4710-5BA 180 Ω @ type 7MH4710-5CA

Technical specifications (continued)

SIWAREX WP351	
Max. strain gauge resistance	4 100 Ω
Temperature coefficient range	≤ ±5 ppm/K
Temperature coefficient zero point	≤ ±0.015 µV/K
Linearity error	≤ 0.001%
Measured value filtering	Low-pass and average value filter configurable (DR3)
Galvanic isolation	500 V AC
50 Hz / 60 Hz noise suppression CMRR	> 80 dB
Input resistance	
• Signal line	Typ. $8*10^6$ Ω
• Sense line	Typ. $300*10^6$ Ω
Cable length	
• When using SIWAREX cable 7MH4702-8AG	Max. 500 m
Ambient conditions	
Ambient temperature in operation	
• Horizontal mounting position *	Min. -30 °C Max. +60 °C
• Vertical mounting position *	Min. -30 °C Max. +50 °C
Storage and transport temperature	-40 ... +70 °C (-40 ... +158 °F)

* At a height of more than 2 000 m above sea level, a derating of the ambient temperature of -1 °C / 100 m has to be adhered to. The maximum permissible height is 5 000 meters above sea level. At over 0.6 A total current of the digital outputs DQ, a derating of the ambient temperature of -1 °C per 100 mA has to be adhered to. The max. permissible total current is 1.5 A.

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Overview



Technical properties

- Counter module for ET 200SP
- Interfaces:
  - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
  - 24 V encoder supply output, short-circuit-proof
  - 3 digital inputs for controlling the count operation, for saving or for setting the count value
  - 2 digital outputs for fast reactions regardless of the counter status or measured value
- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at encoder and digital inputs

Supported types of encoders/signals

- 24 V incremental encoder with and without signal N
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS TM Count 1x24V counter module (Extended temperature range and exposure to environmental substances) With one channel, max. 200 kHz; for 24 V encoder	**6AG1138-6AA01-2BA0**
Suitable BaseUnits (Extended temperature range and exposure to environmental substances)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC TM Count 1x24V counter module

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Technical specifications

Article number	6AG1138-6AA01-2BA0 SIPLUS ET 200SP TM COUNT 1X24V
General information	
Product type designation	TM Count 1x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	3
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
• Probe	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- Parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	

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Technical specifications (continued)

Article number	6AG1138-6AA01-2BA0 SIPLUS ET 200SP TM COUNT 1X24V
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	1 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Interface types	
• Sourcing/sinking input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator forward counting (green)	Yes
• Status indicator backward counting (green)	Yes
Integrated Functions	
Counter	Yes
• Number of counters	1

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Technical specifications (continued)

Article number	6AG1138-6AA01-2BA0 SIPLUS ET 200SP TM COUNT 1X24V
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	

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Technical specifications (continued)

Article number	6AG1138-6AA01-2BA0 SIPLUS ET 200SP TM COUNT 1X24V
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Overview



Technical properties

- Counter and position detection module for ET 200SP
- Interfaces:
  - Encoder signals A, B and N for 5 V TTL or RS422 differential signals
  - SSI interface with clock and data for RS422 differential signals
  - 24 V encoder supply output, short-circuit-proof
  - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
  - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counting frequency 1 MHz (4 MHz with fourfold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at encoder and digital inputs

Supported types of encoders/signals

- Incremental encoders with and without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS TM PosInput 1 counter and position detection module (Extended temperature range and exposure to environmental substances) For RS-422 incremental encoders or SSI absolute encoders, 2DI, 2DQ suitable for BU type A0, ambient temperature -40 °C...60 °C;	**6AG1138-6BA01-2BA0**
Suitable BaseUnits (Extended temperature range and exposure to environmental substances)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See TM PosInput 1 counter and position detection module

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Technical specifications

Article number	6AG1138-6BA01-2BA0 SIPLUS ET 200SP TM POSINPUT 1
General information	
Product type designation	TM PosInput 1
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	2
5 V encoder supply	
• 5 V	Yes
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA; Total current of all encoders
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA; Total current of all encoders
Digital inputs	
Number of digital inputs	2
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- Parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	

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Technical specifications (continued)

Article number	6AG1138-6BA01-2BA0 SIPLUS ET 200SP TM POSINPUT 1
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	1 A
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes

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Technical specifications (continued)

Article number	6AG1138-6BA01-2BA0 SIPLUS ET 200SP TM POSINPUT 1
• Singleturn	Yes
Interface types	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator forward counting (green)	Yes
• Status indicator backward counting (green)	Yes
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
- Accuracy	

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Technical specifications (continued)

Article number	6AG1138-6BA01-2BA0 SIPLUS ET 200SP TM POSINPUT 1
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1138-6BA01-2BA0 SIPLUS ET 200SP TM POSINPUT 1
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with µs accuracy
- Outputs for outputting switching signals with µs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS TM Timer DIDQ 10x24 V time-based IO module (Extended temperature range and exposure to environmental substances) 4 time-controlled inputs, 6 time-controlled outputs	**6AG1138-6CG00-2BA0**
Suitable BaseUnits	
(Extended temperature range and exposure to environmental substances)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC TM Timer DIDQ 10x24V time-based IO module

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Technical specifications

Article number	6AG1138-6CG00-2BA0 SIPLUS ET 200SP TM TIMER DIDQ 10x24V
General information	
Product type designation	TM Timer DIDQ 10x24V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	500 mA; Observe derating
Digital inputs	
Number of digital inputs	4
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Digital input with time stamp	Yes
• Counter	Yes
• Counter for incremental encoder	Yes
• Digital input with oversampling	Yes
• HW enable for digital input	Yes
• HW enable for digital output	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
• Minimum pulse width for program reactions	3 µs; for parameterization "none"
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	6
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Digital output functions, parameterizable	
• Digital output with time stamp	Yes
• PWM output	Yes
- Number, max.	6
• Digital output with oversampling	Yes
Switching capacity of the outputs	

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Technical specifications (continued)

Article number	6AG1138-6CG00-2BA0 SIPLUS ET 200SP TM TIMER DIDQ 10x24V
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
Switching frequency	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	3.5 A; Observe derating
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• pulse encoder	Yes
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Bus cycle time (TDP), min.	375 µs
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	Yes
• Number of counters	3
• Counting frequency, max.	200 kHz; with quadruple evaluation
Counting functions	

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Technical specifications (continued)

Article number	6AG1138-6CG00-2BA0 SIPLUS ET 200SP TM TIMER DIDQ 10x24V
• Continuous counting	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm

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Technical specifications (continued)

Article number	6AG1138-6CG00-2BA0 SIPLUS ET 200SP TM TIMER DIDQ 10x24V
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Overview



2-channel pulse output module for SIPLUS ET 200SP

- Operating modes:
  - Single pulse with defined length
  - Pulse chain with defined number of pulses
  - Pulse width modulation (with flexible ON period, optional current control and dither function)
  - PWM signal for controlling a DC motor
  - ON and OFF delay; rising and falling edge can be delayed separately to the microsecond
  - Frequency output with defined output frequency
- Hardware:
  - 2 channels 24 V, 2 A output current output current can be switched in parallel to boost performance to 4 A of output current
  - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
  - Push/pull output driver for especially steep edges at the outputs
  - Polarity change in DC motor operation for direction reversal
  - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 µs
- Channel functions:
  - HW enable;
    start of signal output with the onboard digital input
  - Parameterizable ON delay;
    for precise deceleration between the HW enable and the start of output
  - Current measurement in the operating modes pulse width modulation and pulse chain;
    enables control of the output current mean value over a period. This allows you to compensate for the effect of temperature on the actuator resistance.
  - Cyclic control of the respective main setpoint from the PLC in every operating mode;
    other values can be modified flexibly from the user program.

Overview (continued)

- Supported system functions:
  - Isochronous mode;
    enables precision-timed connection of the setpoint output to a higher-level controller
  - Firmware update
  - Identification data I&M

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS TM Pulse 2x24V pulse output module (Extended temperature range and exposure to environmental substances) PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors	**6AG1138-6DB00-2BB1**
Suitable BaseUnits (Extended temperature range and exposure to environmental substances)	
BU20-P12+A0+4B BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group	**6AG1193-6BP20-7BB1**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC TM Pulse 2x24V pulse output module

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Technical specifications

Article number	6AG1138-6DB00-2BB1 SIPLUS ET 200SP TM PULSE 2x24V
General information	
Product type designation	TM Pulse 2x24 V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	2; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	2; 1 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Freely usable digital input	Yes
• HW enable for digital output	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Type of digital output	P- and M-switching
Number of digital outputs	2; 1 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Freely usable digital output	Yes
• PWM output	Yes
- Number, max.	2; 1 per channel
• Connection of a proportional valve	Yes
• Dithering	Yes
• Current measurement	Yes
• Current control	Yes
• Connection of a DC motor	Yes
• ON-delay	Yes

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Technical specifications (continued)

Article number	6AG1138-6DB00-2BB1 SIPLUS ET 200SP TM PULSE 2x24V
• OFF-delay	Yes
• Frequency output	Yes
• Pulse train	Yes
• Pulse output	Yes
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W; 1 W with High Speed output
Load resistance range	
• lower limit	12 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	2 A; 0.1 A with High Speed output, observe derating
Output delay with resistive load	
• "0" to "1", typ.	0 µs; With High Speed output, 4.5 µs with Standard output
• "0" to "1", max.	0.8 µs; With High Speed output, 9 µs with Standard output
• "1" to "0", typ.	0 µs; With High Speed output, 4.5 µs with Standard output
• "1" to "0", max.	0.8 µs; With High Speed output, 9 µs with Standard output
Parallel switching of two outputs	
• for uprating	Yes
Switching frequency	
• with resistive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• with inductive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
• Current per group, max.	4 A
• Current per module, max.	4 A
Isochronous mode	
Bus cycle time (TDP), min.	250 µs; with 1 channel configuration, 375 µs with 2 channel configuration
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	No
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	

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Technical specifications (continued)

Article number	6AG1138-6DB00-2BB1 SIPLUS ET 200SP TM PULSE 2x24V
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm

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Technical specifications (continued)

Article number	6AG1138-6DB00-2BB1 SIPLUS ET 200SP TM PULSE 2x24V
Weights	
Weight, approx.	50 g

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Overview



SIPLUS WP321 is a versatile and flexible weighing module for the seamless integration of a static scale into the SIMATIC automation environment.

The weighing electronics system is integrated in the SIPLUS ET 200SP series and uses all the features of a modern automation system, such as integrated communication, operator control and monitoring, diagnostic system and configuration tools in the TIA Portal, SIMATIC STEP 7, WinCC flexible and PCS 7.

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information has been added.

Selection and ordering data

SIPLUS WP321 weighing module Single-channel, for platform or hopper scales with analog load cells (1–4 mV/V), 1 x LC, 1 x RS 485. Extended temperature range and exposure to environmental substances	**6AG1138-6AA00-2BA8**
Accessories, Mandatory	
Suitable SIPLUS BaseUnit Type A0 – one BaseUnit required for each WP321	
• For opening a new potential group	
- BU15P-16+A0+2D or	**6ES7193-6BP00-0DA0**
- BU15P-16+A10+2D	**6ES7193-6BP20-0DA0**
• For continuing the potential group	
- BU15P-16+A0+2B	**6ES7193-6BP00-0BA0**
- BU15P-16+A10+2B	**6ES7193-6BP20-0BA0**
Consumables	
Shield connection for BaseUnit Set for 5 shield connections, with 5 shield connection clamps, 5 supports, 5 support elements	**6ES7193-6SC20-1AM0**
Shield connection element Sufficient for one SIWAREX FTA module	**6ES7390-5AA00-0AA0**
SIWAREX JB junction box, aluminum casing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel enclosure For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel enclosure (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or prototype test certificate).	**7MH5001-0AA01**
Ex interface, type SIWAREX IS For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX weighing electronics. Compatibility of the load cells must be checked separately.	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**
Cables (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, orange sheath For connecting SIWAREX weighing electronics to junction boxes (JB), extension boxes (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is permitted. Outer diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter	
Sheath color: orange	**7MH4702-8AG**
For hazardous areas. Sheath color: blue	**7MH4702-8AF**
Configuration software	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**

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Selection and ordering data (continued)

SIWAREX PCS 7 AddOn Library for PCS 7 V8.x and V9.0 • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scales) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (loss in weight)	**7MH4900-1AK61**
Documentation	
SIWAREX WP321 Equipment Manual Available in a range of languages Free download from the Internet at this link.	
SIWAREX WP321 "Ready for use" TIA Portal and SIMATIC Manager sample configuration Free download from the Internet at this link.	

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Technical specifications

Article number	6AG1138-6AA00-2BA8 SIPLUS ET 200SP WP321
General information	
Product type designation	TM SIWAREX WP321 ST
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Adjustment of measuring range	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes
Encoder supply	
Output voltage (DC)	4.85 V
Short-circuit protection	Yes
Encoder	
Connection of signal encoders	
• For strain gauges (full bridges) with 4-conductor connection	Yes
• For strain gauges (full bridges) with 6-conductor connection	Yes
• Resistance of full bridge, min.	40 Ω; when using SIWAREX IS: 50 ohm for 7MH4710-5BA; 105 ohm when using 7MH4710-5CA
• Resistance of full bridge, max.	4 100 Ω
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Error limit according to DIN 1319-1	0.05 %; of full-scale value
Temperature coefficient, zero point	≤ ±0.1 µV/K
Temperature coefficient, span	≤ ±5 ppm/K
Temperature coefficient, span, 4-wire connection (in relation to end value)	≤ ±5 ppm/K
Temperature coefficient, span, 6-wire connection (in relation to end value)	≤ ±10 ppm/K
1. Interface	
Interface types	
• RS 485	Yes; 390 Ω, 220 Ω, 390 Ω connectable termination
Interface types	
RS 485	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 000 m; ≤ 115 kbps, shielded cable
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Diagnostic alarm
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• ERROR LED	Yes; green/red DIAG LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
Integrated Functions	
Counter	Yes
Load cell	

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Technical specifications (continued)

Article number	6AG1138-6AA00-2BA8 SIPLUS ET 200SP WP321
• Non-automatic weighing instrument	NAWI
• Sampling rate	600 Hz
• Resolution of input signal	±500 000 parts pro mV/V
• Common mode voltage, min.	0.25 V
• Common mode voltage, max.	4.75 V
• input resistance of signal line, typ.	4 MΩ
• input resistance of sense line, typ.	2 MΩ
• Cable length, max.	500 m; when using the SIWAREX 7MH4702-8AG cable
Measuring functions	
- Measuring range	
- -1 mV/V to +1 mV/V	Yes; corresponds to a resolution of ±500 000 parts
- -2 mV/V to +2 mV/V	Yes; corresponds to a resolution of ±1 000 000 parts
- -4 mV/V to +4 mV/V	Yes; corresponds to a resolution of ±2 000 000 parts
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability

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Technical specifications (continued)

Article number	6AG1138-6AA00-2BA8 SIPLUS ET 200SP WP321
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

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Overview



SIMATIC ET 200SP CM PtP video



- CM PtP communications module;
  module for serial communication connections with RS232 and RS422 interfaces. RS485 for the Freeport, 3964(R), Modbus RTU, USS and DMX512 protocols, max. 250 kbps, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
  - Freeport: User-parameterizable frame format for universal communication, also known as ASCII frame
  - 3964(R) for improved transmission reliability
  - Modbus RTU master (requires instructions in SIMATIC S7)
  - Modbus RTU device (requires instructions in SIMATIC S7)
  - USS, implemented through instructions
  - DMX512, can be implemented through instructions
- Interface properties
  - RS232 with accompanying signals
  - RS422 for full duplex connections
  - RS485 for half duplex and multi-point connections
  - Transfer rates from 300 to 115200 bps for RS232 and RS422
  - Transfer rates from 300 to 250000 bps for RS485

Overview (continued)

- Frame lengths
  - In universal operation: 2 KB each in send and receive direction
  - In performance-optimized operation: 30 bytes in send direction, 24 bytes in receive direction
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation, and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Color coding of the module type
  - Hardware and firmware version
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection

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Selection and ordering data

	Article No.
CM PtP communications module	
For serial communication connections with RS232, RS422, RS485 interfaces, BU type A0, color code CC00	
• Pack of 1 unit	**6ES7137-6AA01-0BA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10	**6ES7137-6AA01-2BA0**
Accessories	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	
Shield connection	**6ES7193-6SC20-1AM0**
5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	
Mechanical coding elements	
For automatic coding of I/O modules; spare part. 20 units	
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7137-6AA01-0BA0 ET 200SP, CM PTP, PU 1
General information	
Product type designation	CM PtP
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher
• STEP 7 configurable/integrated from version	via GSD as of V5.6 HF4
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
• RS 422	Yes
• RS 232	Yes
• Design of the connection	Push-in terminal
Interface types	
RS 232	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	15 m
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD
RS 485	
• Transmission rate, max.	250 kbit/s
• Cable length, max.	1 200 m; 200 m to 1200 m, depending on transmission speed
RS 422	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m; 200 m to 1200 m, depending on transmission speed
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	Yes
Protocols	
Integrated protocols	
- Freeport	
- Telegram length, max.	2 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
- 3964 (R)	
- Telegram length, max.	2 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
- Modbus RTU master	
- Address area	1 to 247, extended 1 to 65535
- max. number of devices	32
- Modbus RTU device	
- Address area	1 to 247, extended 1 to 65535
Telegram buffer	
• Buffer memory for telegrams	4 kbyte
• Number of telegrams which can be buffered	255

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Technical specifications (continued)

Article number	6ES7137-6AA01-0BA0 ET 200SP, CM PTP, PU 1
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

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Overview



- CM 4x IO-Link communications module
  Serial communications module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher.
- Time-based IO
  Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or liquids dosed in precise quantities.
- Supported data transfer rates
  - COM1 (4.8 kBd)
  - COM2 (38.4 kBd)
  - COM3 (230.4 kBd)
- Expansion limits
  - Cable length: Max. 20 m
  - Max. 32 bytes of input and output data per port
  - Max. 144 bytes of input data and 128 bytes of output data per module
- Supported ET 200SP system functions
  - Replacement without PG with automatic backup without the engineering tool of the IO-Link device parameters (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
  - Re-parameterization during operation
  - Identification data I&M
  - Firmware update
  - PROFIenergy
- Can be plugged into type A0 BaseUnits (BU) with automatic e-coding
- LED displays
  - DIAG: Operating state display (green/red) of the module
  - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
  - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
  - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
  - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color-coding of the CM module class: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional accessories
  - Labeling strips
  - Equipment labeling plate
  - Color-coded label with color code CC04
- Optional system-integrated shield connection

Overview of CM 4xIO-Link

Communications module	Article No.	CC code	BU type	Pkg. unit
CM 4xIO-Link	6ES7137-6BD00-0BA0	CC04	A0	1

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Overview (continued)

Overview of BaseUnits

BaseUnit	Article No.	CC codes for process terminals	CC codes for AUX terminals	Pkg. unit
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10

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Selection and ordering data

	Article No.
CM 4x IO-Link master V1.1 Standard communications module Serial communications module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	**6ES7137-6BD00-0BA0**
Accessories	
Suitable type A0 BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1 000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1 000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
Color-coded labels	
Color code CC04, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16); 10 units	**6ES7193-6CP04-2MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Spare parts	

Selection and ordering data (continued)

	Article No.
Electronic coding element type H Pack of 5 units; included in scope of supply of CM 4x IO-Link module	**6ES7193-6EH00-1AA0**
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-Link ST
General information	
Product type designation	CM 4 x IO-Link ST
Product function	
• Isochronous mode	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15 or higher
• STEP 7 configurable/integrated from version	STEP 7 V5.5 or higher
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA per channel
Supply voltage	
Rated value (DC)	24 V
Encoder supply	
Number of outputs	4
Output current	
• Rated value	700 mA; Per channel
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Cycle time, min.	2 ms; dynamic, depending on user data length
Size of process data, input per port	32 byte; max.
Size of process data, input per module	144 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	128 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m
Time Based IO	
• TIO IO-Link IN	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
• TIO IO-Link OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
• TIO IO-Link IN/OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
Connection of IO-Link devices	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal
• via three-wire connection	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED

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Technical specifications (continued)

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-Link ST
• Channel status display	Yes; one green LED for channel status Qn (SIO mode) and port status Cn (IO-Link mode) per channel
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

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Overview



SIMATIC ET 200SP DALI video



- DALI 2 multimaster module for 1 bus strand
- Allows the control, diagnostics and parameter assignment of up to 64 luminaires and 63 sensors via a 2-wire bus line
- Typical areas of application: Lighting in tunnels, (factory) halls or ships
- Realization of the control via prefabricated blocks of a function block library in TIA Portal
- DALI (Digital Addressable Lighting Interface) certification according to DALI V2 for IEC 62386-101/-103 parts
- Different DALI device types, such as LED modules, fluorescent lamps, discharge lamps, low-voltage halogen lamps and others, can be used

Selection and ordering data

CM 1xDALI, DALI V2 multimaster module For control of lighting solutions with DALI V2, BU type U0, color code CC20	**6ES7137-6CA00-0BU0**
Accessories	
Suitable type U0 BaseUnits	
BU20-P16+A0+2D BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DU0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BU0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP00-2BU0**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7137-6CA00-0BU0 ET 200SP, CM 1x DALI
General information	
Product type designation	CM 1xDALI
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15.1 or higher
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Interface types	
DALI	
• Integrated power supply	Yes
- Supply current, min.	160 mA
- Supply current, max.	250 mA
- Can be switched off	Yes
• Cable length, max.	300 m
Protocols	
DALI	
• Standard according to DALI	DALI V2 Multi-Master
- Supported operating devices	
- Fluorescent lamps (device type 0)	Yes
- Emergency lighting with single battery (device type 1)	Yes
- Discharge lamps (device type 2)	Yes
- Low-voltage halogen lamps (device type 3)	Yes
- Incandescent lamps (device type 4)	Yes
- Direct voltage (device type 5)	Yes
- LED modules (device type 6)	Yes
- Switching function (device type 7)	Yes
- Color control (device type 8)	Yes
- Further operating devices	Yes; general device type
- Supported input devices	
- Pushbuttons	Yes
- Absolute input devices	Yes
- Presence detector	Yes
- Light sensor	Yes
- Further input devices	Yes; general device type
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• short-circuit	Yes; On DALI bus
Diagnostics indication LED	
• ERROR LED	Yes
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED
Potential separation	
between backplane bus and interface	Yes
Standards, approvals, certificates	
CE mark	Yes
RoHS conformity	Yes

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Technical specifications (continued)

Article number	6ES7137-6CA00-0BU0 ET 200SP, CM 1x DALI
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Decentralized operation	
to SIMATIC S7-1200	Yes; FW V4.0 or higher
to SIMATIC S7-1500	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	50 g

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Overview



- For data exchange between an ET 200SP system and CAN 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
  - Node / lifeguarding
  - Heartbeat
  - SYNC (producer / consumer)
- Integration into TIA from TIA Portal V17
- CAN connection with push-in terminals
- Integrated CAN bus terminating resistor
- Up to 60 CAN nodes
- 128 receiver and 128 transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Optionally with function block SIMATIC ECC CHAdeMO: Realization of digital communication as basis for conductible DC charging of electric vehicles in line with the CHAdeMO standard

Selection and ordering data

ET 200SP CM CAN communications modules To connect ET 200SP with CAN bus or CANopen networks CAN bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302	**6ES7137-6EA00-0BA0**
Accessories	
SIMATIC ECC CHAdeMO function block For realization of digital communication between a DC charging station and an electric vehicle according to CHAdeMO 1.x-2.0 specification; can be used with TIA Portal as of V15.1; Single license	**6FE1263-8FB10-0AA0**
Suitable type A0 BaseUnits	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7137-6EA00-0BA0 ET 200SP CM CAN
General information	
Product type designation	CM 1x CAN ST
Product function	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15.1 or higher
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface type	CAN according to CiA 303-1
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
• Design of the connection	Push-in terminal
CAN	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	10 kbit/s
• Transmission rate, max.	1 000 kbit/s
• max. number of devices	60
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	128; Send / receive
- Services	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
Potential separation	
between backplane bus and interface	Yes
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes; Reg. No.: R-R-S49-ET200SPCMCAN
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m

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Technical specifications (continued)

Article number	6ES7137-6EA00-0BA0 ET 200SP CM CAN
Decentralized operation	
to SIMATIC S7-300	No
to SIMATIC S7-400	No
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	32 g

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Overview



CM AS-i Master ST for SIMATIC ET 200SP



Video: AS-Interface – Powerful integration in SIMATIC ET 200SP

More information

Equipment Manual, **see** https://support.industry.siemens.com/cs/ww/en/view/71756485

SIMATIC ET200SP Manual Collection, **see** https://support.industry.siemens.com/cs/ww/en/view/84133942

Diagnostics blocks with visualization, **see** https://support.industry.siemens.com/cs/ww/en/view/109479103

AS-Interface block library for SIMATIC PCS 7 for simple connection of AS-Interface to PCS 7, **see** https://support.industry.siemens.com/cs/ww/en/view/109759605

Released combinations of the AS-i modules for ET 200SP, **see** https://support.industry.siemens.com/cs/ww/en/view/103624653

AS-Interface I/O modules and other AS-Interface system components, **see** Catalog IC 10

For more information, **see** www.siemens.com/as-interface

The CM AS-i Master ST communications module is designed for use in the SIMATIC ET 200SP distributed I/O system and has the following features:

- Connection of up to 62 AS-Interface slaves
- Supports all AS-Interface master functions according to the AS-Interface specification V3.0
- User-friendly configuration with graphic or tabular display of the AS-i line in TIA Portal or STEP 7 (Classic) or via GSD in other systems
- Supply via AS-Interface cable
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage
- Extended temperature range from -25 °C (from hardware function status FS20 onwards)
- Integrated ground fault monitoring for the AS-Interface cable
- Through connection to AS-Interface, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM AS-i Master ST)
- Integrated analog value processing

AS-i gateways with ET 200SP

An AS-i gateway or AS-i link enables access to the AS-Interface data via PROFINET, PROFIBUS, EtherNet/IP, or Modbus TCP.

Overview (continued)

With the CM AS-i Master ST module, flexible and powerful AS-i link solutions or stand-alone ET 200SP CPU stations with AS-i connection are set up. Depending on the requirements, even several AS-i masters can be plugged into one ET 200SP station, so that the setup can easily be extended from a single master to double masters or multi-masters.

The maximum number of modules is determined by the ET 200SP interface module (IM): up to 32 AS-i masters with PROFINET IM 155-6PN Standard (6ES7155-6AU02-0BN0), up to 43 AS-i masters with IM 155-6PN High Feature, or a single AS-i master with IM 155-6PN Basic. For the connection to PROFIBUS, the IM 155-6DP HF interface module with up to 7 AS-i master modules is used. With the MultiFieldbus interface module IM 155-6MF, the AS-i master modules are connected to PROFINET, Ethernet/IP, and Modbus TCP.

Since in many plants an ET 200SP station with I/O, motor starter or other peripheral modules is provided, the AS-i master modules are simply plugged in without any additional effort. There are countless possible combinations.

An AS-i Safety gateway can also be implemented without any problems by adding the safety-related module F-CM AS-i Safety ST in the ET 200SP station. This greatly simplifies the cabling and connection of distributed EMERGENCY-STOP pushbuttons and protective door monitoring systems to a Failsafe CPU. The AS-i Safety application is completely configured in TIA Portal/STEP 7.

The ET 200SP modules CM AS-i Master ST and F-CM AS-i Safety ST (see F-CM AS-i Safety ST for SIMATIC ET 200SP) can of course also be used directly on an ET 200SP CPU or F-CPU, so that an extremely compact SIMATIC controller with AS-i bus connection can be set up.

For further application possibilities, see the brochure "The modular AS-i Master".

For more information, see SIMATIC ET 200SP Manual Collection.

Design

The CM AS-i Master ST module has an ET 200SP module enclosure with a width of 20 mm. A C0 type BaseUnit (BU) is required for use in the ET 200SP.

The communications module has LED displays for diagnostics, operation, AS-i voltage and AS-i slave status and offers informative front-side module inscription for

- Plain-text marking of the module type and function class
- 2D matrix code (Article No. and serial number)
- Circuit diagram
- Color coding module type communications module: light gray
- Hardware and firmware version
- Supported BaseUnit type BU: C0

Function

The CM AS-i Master ST communications module supports all specified functions of the AS-Interface specification V3.0.

The input/output values of the digital AS-i slaves can be activated via the cyclic process image. The values of the analog AS-i slaves are accessible via the cyclic process image or via data record transfer.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the online functions in STEP 7/TIA Portal.

For the implementation of modular machine concepts, the AS-i slaves can be activated or deactivated via the PLC program (option handling). The configuration of AS-i slaves can be modified while being executed, thus enabling variable machine setups and tool changing with integrated input/output modules during ongoing

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Overview (continued)

operation. AS-i input/output modules can be added to the system without deactivating the controller.

An existing AS-i installation can be read into the STEP 7 hardware configuration and adapted and documented in the project. Analog values are transmitted via the cyclic process image, the length of which is adjustable and extendable up to 288 bytes (depending on the interface module (IM) used).

Diagnostics information is accessed via automatic alarm indications, via the status information in the process image or via the graphical status display in the online diagnostics of the TIA Portal. The transmission quality of the AS-i network can also be read out. To avoid configuration errors, duplicate addresses can be detected on the AS-i network.

Configuration is possible with SIMATIC CPUs S7-400 up to S7-1500 and with a SINUMERIK or other controller.

The online diagnostic status of the AS-i slaves can be displayed directly on the devices in the network view in TIA Portal.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see www.siemens.com/cybersecurity-industry.

Configuration

The following software is required for configuration of the CM AS-i Master ST module:

- STEP 7 (TIA Portal) or
- STEP 7 (Classic) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

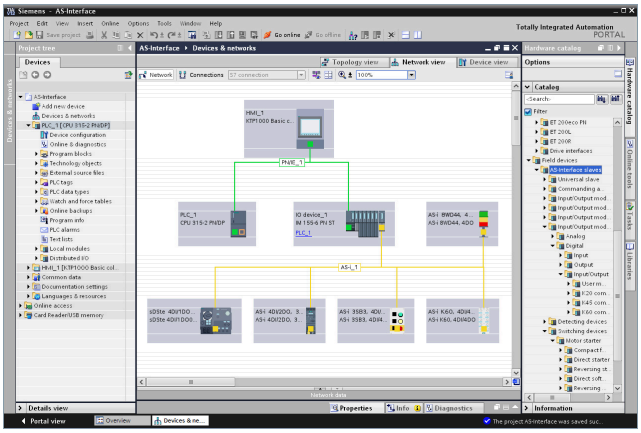
STEP 7 enables user-friendly configuration and diagnostics of the AS-i master and any connected slave modules.

Alternatively, you can also apply the AS-Interface ACTUAL configuration as the TARGET configuration at the "touch of a button" via the online function integrated in the TIA Portal or an optional expansion button. Configuration with the GSD file is possible only with the button.

In the default setting, the CM AS-i Master ST module occupies 32 input/output bytes. To adapt the number and type of AS-i slaves used, the I/O address space can be reduced, or expanded up to 288 bytes.

Together with an ET 200SP CPU 1510SP, 1512SP, 1514SP, or 1515SP PC, preprocessing of AS-i signals directly in the ET 200SP station and setting up of an independent AS-i station without a higher-level CPU are possible.

Overview (continued)



Configuration of an AS-Interface network with CM AS-i Master ST via the TIA Portal

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Benefits

The CM AS-i Master ST communications module for ET 200SP enables modular, simple and high-performance expansion of AS-interface networks via engineering in the TIA Portal.

Up to 32 CM AS-i Master ST units can be plugged into one ET 200SP station with IM 155-6PN Standard. When using the IM 155-6PN High Feature, the number of CM AS-i Master ST in the ET 200SP station can be further increased. The maximum configuration depends on the interface module used. Multiple masters as well as single masters can thus be implemented in the ET 200SP depending on the number of modules.

Together with the interface module, a scalable PROFINET/AS-i Link or PROFIBUS/AS-i Link can be assembled.

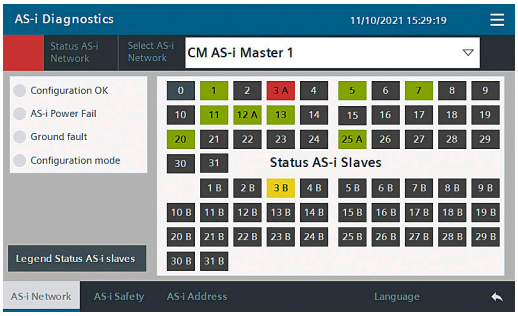
For the connection of an AS-i network to systems with EtherNet/IP and Modbus TCP, the ET 200SP MultiFieldbus interface module IM155-6MF in combination with the CM AS-i Master ST module is available.

Using TIA Portal/STEP 7, the AS-i network is consistently configured and programmed in the SIMATIC controller with only one configuration tool.

The PRONETA PC program (for ET 200SP with PROFINET interface module) is available for convenient input/output testing during the commissioning of an AS-i network without a CPU; see www.siemens.com/proneta.

The CM AS-i Master ST module can be used in a system with PROFINET system redundancy S2. Furthermore, the CM AS-i Master ST module (from FW version V1.1.11 onwards or from FW version 2.0 onwards) can be used in a system with PROFINET system redundancy R1 with SIMATIC S7-1500R/H CPU.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/109479103.

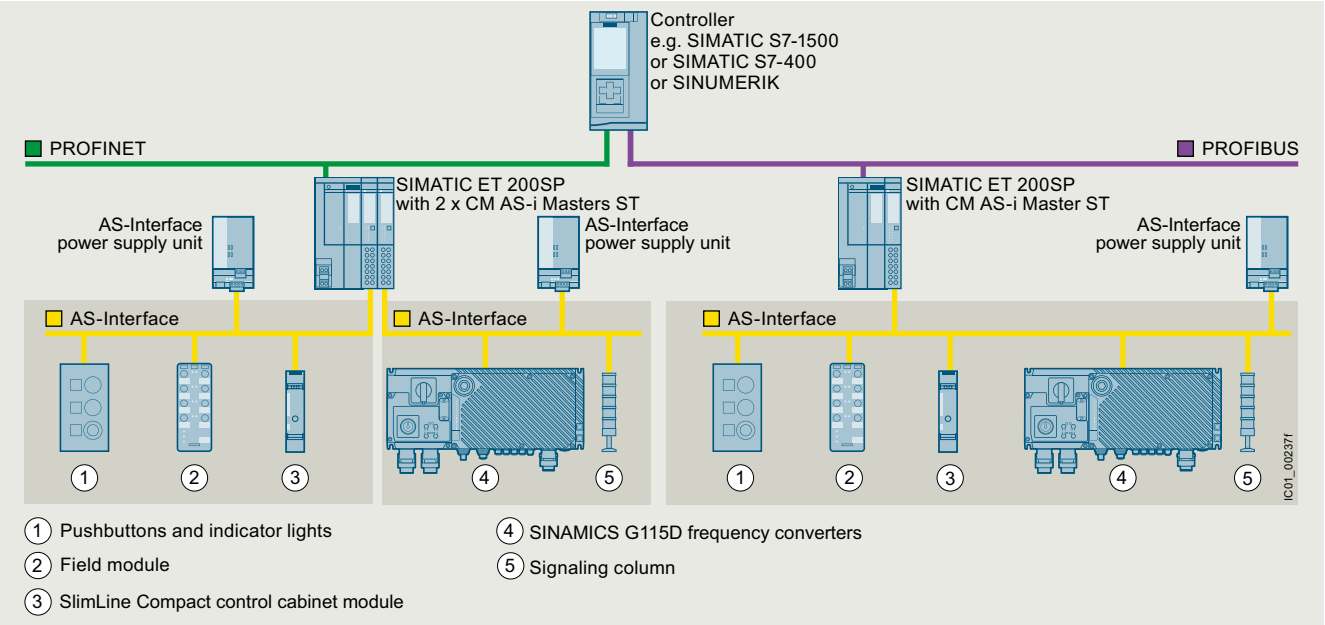


Diagnostics block for CM AS-i Master ST

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Application

Configuration examples of AS-Interface networks with CM AS-i Master ST for SIMATIC ET 200SP



Configuration of AS-Interface networks under a SIMATIC ET 200SP

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Selection and ordering data

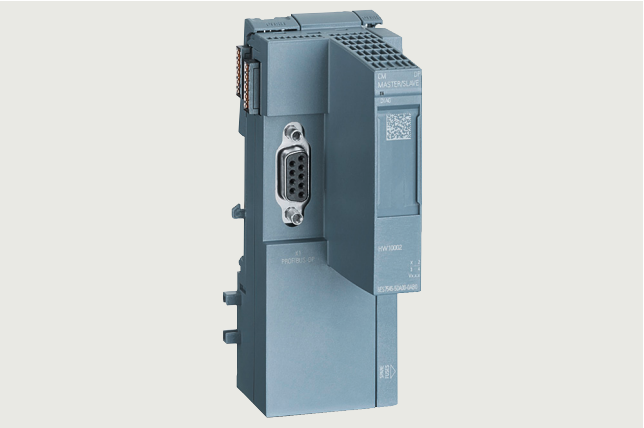
Ordering data	Article No.
CM AS-i Master ST communications module • AS-Interface master for SIMATIC ET 200SP, can be plugged onto BaseUnit type C0 • Corresponds to AS-Interface specification V3.0 • Dimensions W x H x D (mm): 20 x 73 x 58	**3RK7137-6SA00-0BC1**
Accessories	
BaseUnit BU20-P6+A2+4D • BaseUnit (light), BU type C0 • Suitable for the CM AS-i Master ST module • For connection of the AS-Interface cable to the CM AS-i Master ST • Start of an AS-i network, isolation of the AS-i voltage from the left-hand module	**6ES7193-6BP20-0DC0**
PROFINET IM 155-6PN Basic interface module Max. 12 I/O modules, max. 32 bytes of I/O data per station	
• Including server module and 2 x RJ45 ports (supplied without RJ45 plug)	**6ES7155-6AR01-0AN0**
PROFINET IM 155-6PN Standard interface modules Max. 32 I/O modules, max. 1 440 bytes of I/O data per station	
• Including server module and BusAdapter 2 x RJ45 (supplied without RJ45 plug)	**6ES7155-6AA02-0BN0**
• Including server module (BusAdapter must be ordered separately, see below)	**6ES7155-6AU02-0BN0**
PROFINET IM 155-6PN High Feature interface modules Max. 64 I/O modules, max. 1 440 bytes of I/O data per station	
• **IM 155-6PN/2 High Feature** 2-port IM with a BusAdapter slot, including server module (BusAdapter must be ordered separately, see below)	**6ES7155-6AU01-0CN0**
• **IM 155-6PN/3 High Feature** 3-port IM with two BusAdapter slots, including server module (BusAdapter must be ordered separately, see below)	**6ES7155-6AU30-0CN0**
PROFINET IM 155-6PN High Speed interface module Max. 30 I/O modules, max. 968 bytes of I/O data per station	
• Including server module (BusAdapter must be ordered separately, see below)	**6ES7155-6AU00-0DN0**
PROFIBUS IM 155-6DP High Feature interface module Max. 32 I/O modules, max. 244 bytes of I/O data per station	
• Including server module and PROFIBUS plug	**6ES7155-6BA01-0CN0**
MultiFieldbus IM 155-6MF High Feature interface module For operation on PROFINET, EtherNet/IP or Modbus TCP controllers, one slot for BusAdapter, max. 64 I/O modules, max. 1 440 bytes I/O data per station	
• Including server module (BusAdapter must be ordered separately, see below)	**6ES7155-6MU01-0CN0**
For more information, see https://support.industry.siemens.com/cs/ww/en/view/109779189.	
BusAdapters for PROFINET/Ethernet/Modbus TCP For connection of the Ethernet cable to the PROFINET IM 155-6PN interface module and the MultiFieldbus IM 155-6MF interface module	
• Connection 2 x RJ45 (supplied without RJ45 plug)	**6ES7193-6AR00-0AA0**
• Connection 2 x FC (FastConnect)	**6ES7193-6AF00-0AA0**
For more BusAdapters with fiber-optic cable connection, see SiePortal.	

Selection and ordering data (continued)

Ordering data	Article No.
AS-Interface addressing unit V3.0 • For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i specification V3.0 • For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with four type AA batteries (IEC LR6, NEDA 15) • Degree of protection IP40 • Dimensions W x H x D (mm): 84 x 195 x 35 • Scope of supply: - Addressing unit with four batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m	**3RK1904-2AB02**

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Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 Kbps to 12 Mbps
- Communications services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication:
    This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data record routing

Selection and ordering data

CM DP for ET 200SP CPU PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
PROFIBUS DP RS 485 bus connector With 90° cable outlet, max. transfer rate 12 Mbps	
• without PG interface	**6ES7972-0BA12-0XA0**
• with PG interface	**6ES7972-0BB12-0XA0**
With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps	
• without PG interface, 1 unit	**6ES7972-0BA52-0XA0**
• without PG interface, 100 units	**6ES7972-0BA52-0XB0**
• with PG interface, 1 unit	**6ES7972-0BB52-0XA0**
• with PG interface, 100 units	**6ES7972-0BB52-0XB0**
FastConnect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7545-5DA00-0AB0 ET 200SP, cm DP for ET 200SP CPU
General information	
Product type designation	CM PROFIBUS DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V13 Update 3
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125
- Services	
- PG/OP communication	Yes
- Equidistance	No
- Isochronous mode	No
- activation/deactivation of DP devices	Yes
PROFIBUS DP device	
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	Yes
• Address area, max.	120
• User data per address area, max.	128 byte
- Services	
- PG/OP communication	Yes; Only with active interface
- Routing	Yes; Only with active interface
- S7 communication	Yes; Only with active interface
- Direct data exchange (slave-to-slave communication)	Yes; No subscriber possible - only passive publisher
- DPV1	Yes
- Transfer memory	
- Inputs	244 byte
- Outputs	244 byte
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
• Cable length, max.	100 m
Protocols	
SIMATIC communication	
• S7 routing	Yes
• Data record routing	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostics indication LED	
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation

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Technical specifications (continued)

Article number	6ES7545-5DA00-0AB0 ET 200SP, cm DP for ET 200SP CPU
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	35 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	80 g

More information

More information and downloads

Manuals

The manuals for ET 200SP can be downloaded online for free (SIMATIC Customer Support), see under this link.

General information

is available under this link.

The SIMATIC Selection Tool

is available under this link.

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

G_IK10_XX_50730

The CP 1542SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP for authentication on an email server (also with IPv6)
  - SNMPv1 for transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

Selection and ordering data

	Article No.
CP 1542SP-1 communications processor For connection of SIMATIC S7 ET 200SP to Industrial Ethernet, open IE communication (TCP/IP, ISO-ON-TCP, UDP), PG/OP, S7 routing, IP broadcast/multicast, SNMPV1, DHCP, email, IPv4/IPv6, time synchronization via NTP, access to web server of CPU, BusAdapter required	**6GK7542-6UX00-0XE0**

Accessories

	Article No.
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules, standard function class or above; max. cable length 50 m	**6ES7193-6AR00-0AA0**
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules, standard function class or above; for increased vibration and EMC load rating; max. cable length 50 m	**6ES7193-6AF00-0AA0**
SIMATIC BA 2xSCRJ BusAdapter For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load rating; max. cable length 50 m (POF) or 100 m (PCF);	**6ES7193-6AP00-0AA0**
SIMATIC BA SCRJ/RJ45 BusAdapter For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load rating; max. cable length 50 m (POF) or 100 m (PCF);	**6ES7193-6AP20-0AA0**
SIMATIC BA SCRJ/FC BusAdapter For PROFINET interface modules, High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC load rating; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP40-0AA0**
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6$_A$) with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB12-2AA0**
• 1 pack = 10 units	**6GK1901-1BB12-2AB0**
• 1 pack = 50 units	**6GK1901-1BB12-2AE0**
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**

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Accessories (continued)

	Article No.
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Labeling strips	
500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AG0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Spare parts	
Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules	**6ES7193-6PA00-0AA0**
PE connection element for mounting rail 2000 mm 20 units	**6ES7590-5AA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage with push-in terminals	**6ES7193-4JB00-0AA0**

Technical specifications

Article number	**6GK7542-6UX00-0XE0**
product type designation	**CP 1542SP-1**
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7542-6UX00-0XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	19.2 ... 28.8 V
power loss [W]	6 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +50 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
width	60 mm
height	117 mm
depth	74 mm
net weight	0.18 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	2
• note	2 CPs can be pluged in per CPU, simultaneous operation with BA Send and CM DP is possible
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	32
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte

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Technical specifications (continued)

Article number	6GK7542-6UX00-0XE0
product type designation	CP 1542SP-1
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
performance data multi-protocol mode	
number of active connections with multi-protocol mode	32
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	No
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes; via ET 200SP CPU
product functions security	
product function	
• blocking of communication via physical ports	Yes
product functions time	
product function SICLOCK support	Yes
product function pass on time synchronization	No
protocol is supported	
• NTP	Yes
• NTP (secure)	No
time synchronization	
• from NTP-server	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes

Technical specifications (continued)

Article number	6GK7542-6UX00-0XE0
product type designation	CP 1542SP-1
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	207.05 kg
• during manufacturing	19.13 kg
• during operation	187.74 kg
• after end of life	0.18 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

More information

You will find more information on ET 200SP at
www.siemens.com/simatic-et200sp
The TIA Selection Tool is available to assist you in selecting ET 200SP equipment and configuring modular variants:
www.siemens.com/tst
You will find more information on the topic of Industrial Security on the Internet at:
https://www.siemens.com/industrialsecurity
An ET 200SP Distributed Controller firmware version ≥ 2.0 is required for operation of the CP 1542SP-1.

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

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The CP 1543SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols (e.g. SNMPv3), the communications processor protects individual ET 200SP distributed controllers or even entire automation cells against unauthorized access.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions can be configured with STEP 7 Professional, V14 (TIA Portal) and higher.

The CP 1543SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
- Support of SINEMA Remote Connect with autoconfiguration
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

Selection and ordering data

	Article No.
CP 1543SP-1 communications processor CP 1543SP-1 communications processor for connecting SIMATIC S7 ET 200SP to Industrial Ethernet, Security (firewall and VPN), open IE communication (TCP/IP, ISO-on-TCP, UDP) PG/OP, S7 routing, IP broadcast/multicast, SNMPV1/V3, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, BusAdapter required	**6GK7543-6WX00-0XE0**

Accessories

	Article No.
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules, standard function class or above; max. cable length 50 m	**6ES7193-6AR00-0AA0**
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules, standard function class or above; for increased vibration and EMC load rating; max. cable length 50 m	**6ES7193-6AF00-0AA0**
SIMATIC BA 2xSCRJ BusAdapter For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load rating; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP00-0AA0**
SIMATIC BA SCRJ/RJ45 BusAdapter For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load rating; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP20-0AA0**
SIMATIC BA SCRJ/FC BusAdapter For PROFINET interface modules, High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC load rating; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP40-0AA0**
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6$_A$) with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB12-2AA0**
• 1 pack = 10 units	**6GK1901-1BB12-2AB0**
• 1 pack = 50 units	**6GK1901-1BB12-2AE0**

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Accessories (continued)

	Article No.
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Labeling strips	
500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AG0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Spare parts	
Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules	**6ES7193-6PA00-0AA0**
PE connection element for mounting rail 2000 mm 20 units	**6ES7590-5AA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals	**6ES7193-4JB00-0AA0**

Technical specifications

Article number	**6GK7543-6WX00-0XE0**
product type designation	**CP 1543SP-1**
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7543-6WX00-0XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	19.2 ... 28.8 V
power loss [W]	6 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +50 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
width	60 mm
height	117 mm
depth	74 mm
net weight	0.18 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	2
• note	2 CPs can be pluged in per CPU, simultaneous operation with BA Send and CM DP is possible
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	32
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte

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Technical specifications (continued)

Article number	6GK7543-6WX00-0XE0
product type designation	CP 1543SP-1
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
performance data multi-protocol mode	
number of active connections with multi-protocol mode	32
performance data IT functions	
number of possible connections	
• as email client maximum	1
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes; via ET 200SP CPU
product functions security	
firewall version	stateful inspection
product function with VPN connection	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1
number of possible connections with VPN connection	4
product function	
• switch-off of non-required services	Yes
• blocking of communication via physical ports	Yes
• log file for unauthorized access	Yes
product functions time	
product function SICLOCK support	Yes
product function pass on time synchronization	No
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes

Technical specifications (continued)

Article number	6GK7543-6WX00-0XE0
product type designation	CP 1543SP-1
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	207.05 kg
• during manufacturing	19.13 kg
• during operation	187.74 kg
• after end of life	0.18 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

More information

You will find more information on ET 200SP at
www.siemens.com/simatic-et200sp
The TIA Selection Tool is available to assist you in selecting ET 200SP equipment and configuring modular variants:
www.siemens.com/tst
You will find more information on the topic of Industrial Security on the Internet at:
https://www.siemens.com/industrialsecurity
An ET 200SP Distributed Controller firmware version ≥ 2.0 is required for operation of the CP 1543SP-1.

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

G_IK10_XX_50730

The CP 1542SP-1 IRC communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. In addition, control centers can be connected using various telecontrol protocols.

The CP is characterized by the following:

- Ethernet-based connection to TeleControl Server Basic, e.g. via internet
- Ethernet-based connection to the control center via SINAUT ST7, IEC 60870-5-104 or DNP3 protocol
- Data transfer of measured values, control variables or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 100,000 values ensures a secure database, even with temporary connection failures
- Clearly laid out LED signaling for fast and easy diagnostics
- Fast commissioning thanks to easy configuration using STEP 7

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 IRC supports the following communications services:

- Support of multiple telecontrol protocols such as SINAUT ST7, DNP3, IEC 60870-5-104 and TeleControl Basic
- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP or SMTPS with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Email transfer with addressing by program block
  - Email transfer via "Notifications" (alerts)

Overview (continued)

- Support of SINEMA Remote Connect with autoconfiguration

Selection and ordering data

	Article No.
CP 1542SP-1 IRC communications processor CP 1542SP-1 IRC communications processor for connection of SIMATIC S7-ET 200SP to Industrial Ethernet, TeleControl Server Basic, IEC 60870-5-104 or DNP3 protocol to a control center; open IE communication (TCP/IP, ISO-on-TCP, UDP), IP broadcast/multicast, SNMPV1, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, BusAdapter required	**6GK7542-6VX00-0XE0**

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Accessories

	Article No.
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules, standard function class or above; max. cable length 50 m	**6ES7193-6AR00-0AA0**
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules, standard function class or above; for increased vibration and EMC load rating; max. cable length 50 m	**6ES7193-6AF00-0AA0**
SIMATIC BA 2xSCRJ BusAdapter For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP00-0AA0**
SIMATIC BA SCRJ/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP20-0AA0**
SIMATIC BA SCRJ/FC BusAdapter For PROFINET interface modules, High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC load rating; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP40-0AA0**
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6$_A$) with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB12-2AA0**
• 1 pack = 10 units	**6GK1901-1BB12-2AB0**
• 1 pack = 50 units	**6GK1901-1BB12-2AE0**
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**

Accessories (continued)

	Article No.
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Labeling strips	
500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AG0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Spare parts	
Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules	**6ES7193-6PA00-0AA0**
PE connection element for mounting rail 2000 mm 20 units	**6ES7590-5AA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage with push-in terminals	**6ES7193-4JB00-0AA0**

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Technical specifications

Article number	6GK7542-6VX00-0XE0
product type designation	CP 1542SP-1 IRC
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK7542-6VX00-0XE0
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	19.2 ... 28.8 V
power loss [W]	6 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +50 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
width	60 mm
height	117 mm
depth	74 mm
net weight	0.18 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	2
• note	2 CPs can be pluged in per CPU, simultaneous operation with BA Send and CM DP is possible
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	32
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte

Technical specifications (continued)

Article number	6GK7542-6VX00-0XE0
product type designation	CP 1542SP-1 IRC
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
performance data multi-protocol mode	
number of active connections with multi-protocol mode	32
performance data IT functions	
number of possible connections	
• as email client maximum	1
performance data telecontrol	
suitability for use	
• node station	No
• substation	Yes
• TIM control center	No
control center connection	IEC 60870-5, DNP3, (Modbus TCP by block solutions of the CPU) capable control stations, connection to Telecontrol Server Basic and ST7 capable control station
• by means of a permanent connection	supported
• by means of demand-oriented connection	supported
• note	Connection to SCADA system by IEC 60870-5 104, DNP3, Telecontrol Server Basic and ST7 capable control center
protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST7 protocol	Yes
product function data buffering if connection is aborted	Yes; TCSB 64000 events, SINAUT ST7 32000 telegrams, DNP3 100000 events, IEC 60870-5 100000 events
number of data points per device maximum	1 500
number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes

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Technical specifications (continued)

Article number	6GK7542-6VX00-0XE0
product type designation	CP 1542SP-1 IRC
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
product functions diagnostics	
product function web-based diagnostics	Yes; via ET 200SP CPU
product functions security	
product function with VPN connection	SINEMA RC
product function	
• blocking of communication via physical ports	Yes
product functions time	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	
• NTP	Yes
• NTP (secure)	No
time synchronization	
• from NTP-server	Yes
• from control center	Yes
standards, specifications, approvals	
certificate of suitability CE marking	Yes
certificate of suitability UKCA marking	Yes
certificate of suitability Regulatory Compliance Mark (RCM)	Yes
certificate of suitability RoHS conformity	Yes
certificate of suitability EAC approval	Yes
standards, specifications, approvals hazardous environments header	
certificate of suitability ATEX	Yes
certificate of suitability IECEx	Yes
certificate of suitability CCC for hazardous zone according to GB standard	Yes
certificate of suitability FM registration	Yes
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	207.05 kg
• during manufacturing	19.13 kg
• during operation	187.74 kg
• after end of life	0.18 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

More information

You can find more information on ET 200SP at http://www.siemens.com/simatic-et200sp

The TIA Selection Tool is available to assist you in selecting ET 200SP equipment and configuring modular variants:

- Online version: https://www.siemens.com/tstcloud
- Offline version: https://mall.industry.siemens.com/spicecad/api/CS/thirdParty/tia-selection-tool/download/tia-selection-tool.zip

You can find more information on the topic of Industrial Security on the internet at: https://www.siemens.com/industrialsecurity

Technical requirements/compatibility

An ET 200SP Distributed Controller firmware version ≥ 2.0 is required for operation of the CP 1542SP-1 IRC.

V3 SP3 is required for connection to the Telecontrol Server Basic.

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Overview



- Especially suitable for industrial applications where the device is to be mounted in the control cabinet

Selection and ordering data

	Article No.
SCALANCE WAB763-1 access points	
IWLAN access point, 1 radio, 2.4/5 GHz, IEEE 802.11ax (Wi-Fi 6), 1x R-SMA connector, 1x 10/100/1000 Mbps RJ45 port, 1x 24 V DC, terminal block, IP20, 0...+55 °C, terminal block, note country approvals! Scope of supply: Manuals on DVD, English/German	
Country approvals for operation outside the USA/Israel[1] CERT ID: ELAX-W1-RJ-E1	**6GK5762-1AJ00-6AA0**
Country approval for operation in the USA. CERT ID: ELAX-W1-RJ-E1, FCC ID: LYHELAXV1	**6GK5762-1AJ00-6AB0**

Accessories

	Article No.
IE connecting cable IE FC RJ45 plug 180/IE FC RJ45 plug 180 Preassembled flexible connecting cable with 2x IE FC RJ45 plug 180 4 x 2	
• 2 m	**6XV1878-5BH20**
• 3 m	**6XV1878-5BH30**
• 5 m	**6XV1878-5BH50**
• 10 m	**6XV1878-5BN10**
• 15 m	**6XV1878-5BN15**
• 20 m	**6XV1878-5BN20**
• 25 m	**6XV1878-5BN25**
IE FC standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 plug 4 x 2 and IE M12 plug PRO 4 x 2; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1878-2A**
IE FC TP flexible cable GP 4 x 2 TP installation cable CAT6A for connecting to IE FC RJ45 plug 4 x 2, AWG24; sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1878-2B**
IE TP train cable GP 4 x 2 CAT7 TP installation cable for railway applications, for connection to FC M12 plug PRO 4 x 2, railway-certified, 8-core, shielded; Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m	**6XV1878-2T**
IE FC M12 plug PRO 4 x 2 RJ45 connector (10/100/1000 Mbps) with a rugged metal enclosure and FC connection system, for IE FC cable 4 x 2 (AWG24); 180° cable outlet	
• 1 unit	**6GK1901-1BB11-2AA0**
• 10 units	**6GK1901-1BB11-2AB0**
• 50 units	**6GK1901-1BB11-2AE0**

You will find an overview of our IWLAN antennas under:
https://www.siemens.com/iwlan-antenna

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Technical specifications

Article number	**6GK5762-1AJ00-6AA0**
product type designation **product description**	**WAB762-1** **IWLAN Access Point**
product brand name	SCALANCE
Technical Product Detail Page	https://i.siemens.com/1P6GK5762-1AJ00-6AA0
suitability for use	www.siemens.com/iwlan
transfer rate	
transfer rate	
• with WLAN maximum	601 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s, 1 000 Mbit/s
interfaces	
number of electrical/optical connections for network components or terminal equipment maximum note	1
number of electrical/optical connections for gigabit Ethernet maximum	1
number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole terminal block
memory	
design of the removable storage	
• CLP	No
• CLP iFeatures	No
interfaces wireless	
number of radio cards permanently installed	1
transmission mode for multiple input multiple output (MIMO)	1x1
number of spatial streams	1
number of electrical connections for external antenna(s)	1
type of electrical connection for external antenna(s)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes
signal inputs/outputs	
number of digital inputs	0
number of digital outputs	0
product functions management, configuration, engineering	
product function is supported identification link	Yes; acc. to IEC 61406-1:2022
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	174.6696 kg
• during manufacturing	10.4 kg
• during operation	164 kg
• after end of life	0.173 kg
further information internet links	
• internet link to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• internet link to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• Internet link to website: WLAN country approval	https://www.siemens.com/wireless-approvals
• internet link to the website: IWLAN	https://www.siemens.com/iwlan
• internet link to website: Industrial communication	https://www.siemens.com/simatic-net
• internet link to web page: SiePortal	https://sieportal.siemens.com/
• internet link to website: Image database	https://www.automation.siemens.com/bilddb
• internet link to website: CAx-Download-Manager	https://www.siemens.com/cax
• internet link to website: Industry Online Support	https://support.industry.siemens.com

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Overview



- Especially suitable for industrial applications where the device is to be mounted in the control cabinet

Selection and ordering data

	Article No.
SCALANCE WUB763-1 IWLAN client module	
IWLAN client module, 1 radio, 2.4/5 GHz, IEEE 802.11ax (Wi-Fi 6), 1x R-SMA connector, 1x 10/100/1000 Mbps RJ45 port, 1x 24 V DC, terminal block, IP20, 0...+55 °C, terminal block, note country approvals! Scope of supply: Manuals on DVD, English/German	
Country approvals for operation outside the USA/Israel[1] CERT ID: MSAX-W1-RJ-E2	**6GK5762-1AJ00-1AA0**
Country approval for operation in the USA. CERT ID: ELAX-W1-RJ-E1, FCC ID: LYHELAXV1	**6GK5762-1AJ00-1AB0**
SCALANCE WUB763-1 IWLAN client module (with iFeatures)	
IWLAN access point, 1 radio, 2.4/5 GHz, IEEE 802.11ax (Wi-Fi 6), 1x R-SMA connector, iFeatures support 1x 10/100/1000 Mbps RJ45 port, 1x 24 V DC, terminal block, IP20, 0...+55 °C, terminal block, note country approvals! Scope of supply: Manuals on DVD, English/German	
Country approvals for operation outside the USA/Israel[1] CERT ID: MSAX-W1-RJ-E2	**6GK5762-1AJ00-2AA0**
Country approval for operation in the USA. CERT ID: ELAX-W1-RJ-E1, FCC ID: LYHELAXV1	**6GK5762-1AJ00-2AB0**

Accessories

	Article No.
IE connecting cable IE FC RJ45 plug 180/IE FC RJ45 plug 180	
Preassembled flexible connecting cable with 2x IE FC RJ45 plug 180 4 x 2	
• 2 m	**6XV1878-5BH20**
• 3 m	**6XV1878-5BH30**
• 5 m	**6XV1878-5BH50**
• 10 m	**6XV1878-5BN10**
• 15 m	**6XV1878-5BN15**
• 20 m	**6XV1878-5BN20**
• 25 m	**6XV1878-5BN25**
IE FC standard cable GP 4 x 2	**6XV1878-2A**
8-core, shielded TP installation cable for connection to IE FC RJ45 plug 4 x 2 and IE M12 plug PRO 4 x 2; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC TP flexible cable GP 4 x 2	**6XV1878-2B**
TP installation cable CAT6A for connecting to IE FC RJ45 plug 4 x 2, AWG24; sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	
IE TP train cable GP 4 x 2	**6XV1878-2T**
CAT7 TP installation cable for railway applications, for connection to FC M12 plug PRO 4 x 2, railway-certified, 8-core, shielded; Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m	
IE FC M12 plug PRO 4 x 2	
RJ45 connector (10/100/1000 Mbps) with a rugged metal enclosure and FC connection system, for IE FC cable 4 x 2 (AWG24); 180° cable outlet	
• 1 unit	**6GK1901-1BB11-2AA0**
• 10 units	**6GK1901-1BB11-2AB0**
• 50 units	**6GK1901-1BB11-2AE0**

You will find an overview of our IWLAN antennas under:
https://www.siemens.com/iwlan-antenna

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Technical specifications

Article number	6GK5762-1AJ00-1AA0	6GK5762-1AJ00-2AA0
product type designation product description	WUB762-1 IWLAN client module	WUB762-1 iFeatures IWLAN client module
product brand name	SCALANCE	SCALANCE
Technical Product Detail Page	https://i.siemens.com/1P6GK5762-1AJ00-1AA0	https://i.siemens.com/1P6GK5762-1AJ00-2AA0
suitability for use	www.siemens.com/iwlan	www.siemens.com/iwlan
transfer rate		
transfer rate		
• with WLAN maximum	601 Mbit/s	601 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s, 1 000 Mbit/s	10 Mbit/s, 100 Mbit/s, 1 000 Mbit/s
interfaces		
number of electrical/optical connections for network components or terminal equipment maximum note	1	1
number of electrical/optical connections for gigabit Ethernet maximum	1	1
number of electrical connections		
• for network components or terminal equipment	1	1
• for power supply	1	1
• for redundant voltage supply	0	0
type of electrical connection		
• for network components or terminal equipment	RJ45 socket	RJ45 socket
• for power supply	3-pole terminal block	3-pole terminal block
memory		
design of the removable storage		
• CLP	No	No
• CLP iFeatures	No	No
interfaces wireless		
number of radio cards permanently installed	1	1
transmission mode for multiple input multiple output (MIMO)	1x1	1x1
number of spatial streams	1	1
number of electrical connections for external antenna(s)	1	1
type of electrical connection for external antenna(s)	R-SMA (socket)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes	Yes
signal inputs/outputs		
number of digital inputs	0	0
number of digital outputs	0	0
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	200.91 kg	200.91 kg
• during manufacturing	12.97 kg	12.97 kg
• during operation	187.77 kg	187.77 kg
• after end of life	0.17 kg	0.17 kg
further information internet links		
• internet link to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• internet link to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• Internet link to website: WLAN country approval	https://www.siemens.com/wireless-approvals	https://www.siemens.com/wireless-approvals
• internet link to the website: IWLAN	https://www.siemens.com/iwlan	https://www.siemens.com/iwlan
• internet link to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• internet link to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• internet link to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• internet link to website: CAx-Download-Manager	https://www.siemens.com/cax	https://www.siemens.com/cax
• internet link to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com

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Overview



- Communications module CM PtP;
  Module for serial communication connections with RS232, RS422, RS485 interfaces for the Freeport, 3964(R), Modbus RTU and USS protocols, max. 115.2 kbps, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
  - Freeport: User-parameterizable frame format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU master (requires instructions in SIMATIC S7)
  - Modbus RTU slave (requires instructions in SIMATIC S7)
  - USS, implemented through instructions
  - DMX512, can be implemented through instructions
- Interface properties
  - RS232 with auxiliary signals
  - RS422 for full-duplex connections
  - RS485 for half-duplex and multi-point connections
  - Transfer rates from 300 to 115 200 bps for RS232 and RS422
  - Transfer rates from 300 to 25 000 bps for RS485
- Frame lengths
  - In universal operation: 2 KB each in send and receive direction
  - In performance-optimized operation: 30 bytes in send direction, 24 bytes in receive direction

Overview (continued)

- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation, and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the CM module type: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

SIPLUS ET 200SP CM PtP communications module With conformal coating (-40 ... +70 °C) For serial connection with RS-422, RS-485 and RS-232, Freeport, 3964 (R), USS, MODBUS RTU master, slave, max. 250 Kbps, suitable for BU type A0, pack quantity: 1 unit	**6AG1137-6AA01-7BA0**
Accessories	
SIPLUS BaseUnits type A0 (Extended temperature range and exposure to environmental substances)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC CM PtP

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Technical specifications

Article number	6AG1137-6AA01-7BA0 SIPLUS ET 200SP CM PTP
General information	
Product type designation	CM PtP
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
• RS 422	Yes
• RS 232	Yes
• Design of the connection	Push-in terminal
Interface types	
RS 232	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	15 m
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD
RS 485	
• Transmission rate, max.	250 kbit/s
• Cable length, max.	1 200 m; 100 to 1200 m, depending on transmission speed
RS 422	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	Yes
Protocols	
Integrated protocols	
- Freeport	
- Telegram length, max.	2 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
- 3964 (R)	
- Telegram length, max.	2 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
- Modbus RTU master	
- Address area	1 to 247, extended 1 to 65535
- max. number of devices	32
- Modbus RTU device	
- Address area	1 to 247, extended 1 to 65535
Telegram buffer	
• Buffer memory for telegrams	4 kbyte
• Number of telegrams which can be buffered	255
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes

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Technical specifications (continued)

Article number	6AG1137-6AA01-7BA0 SIPLUS ET 200SP CM PTP
• Hardware interrupt	No
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on land craft, rail vehicles and special-purpose vehicles	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability

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Technical specifications (continued)

Article number	6AG1137-6AA01-7BA0 SIPLUS ET 200SP CM PTP
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

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Overview



- SIPLUS CM 4x IO-Link communications module
  Serial communications module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher.
- Time-based IO
  Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or liquids dosed in precise quantities.
- Supported data transfer rates
  - COM1 (4.8 kBd)
  - COM2 (38.4 kBd)
  - COM3 (230.4 kBd)
- Expansion limits
  - Cable length: Max. 20 m
  - Max. 32 bytes of input and output data per port
  - Max. 144 bytes of input data and 128 bytes of output data per module
- Supported ET 200SP system functions
  - Replacement without PG with automatic backup without the engineering tool of the IO-Link device parameters (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
  - Re-parameterization during operation
  - Identification data I&M
  - Firmware update
  - PROFIenergy
- Can be plugged into type A0 BaseUnits (BU) with automatic e-coding

Overview (continued)

- LED displays
  - DIAG: Operating state display (green/red) of the module
  - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
  - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
  - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
  - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color-coding of the CM module class: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional accessories
  - Labeling strips
  - Equipment labeling plate
  - Color-coded label with color code CC04
- Optional system-integrated shield connection

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

	Article No.
SIPLUS CM 4x IO-Link master V1.1 Standard communications module (Extended temperature range and exposure to environmental substances) Serial communications module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	**6AG1137-6BD00-2BA0**
Suitable type A0 BaseUnits	
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC CM 4x IO-Link

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Technical specifications

Article number	6AG1137-6BD00-2BA0 SIPLUS ET 200SP CM 4XIO-LINK
General information	
Product type designation	CM 4 x IO-Link ST
Product function	
• Isochronous mode	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA per channel
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4
Output current	
• nominal	700 mA; Per channel
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Cycle time, min.	2 ms; dynamic, depending on user data length
Size of process data, input per port	32 byte; max.
Size of process data, input per module	144 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	128 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m
Time Based IO	
• TIO IO-Link IN	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
• TIO IO-Link OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
• TIO IO-Link IN/OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
Connection of IO-Link devices	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal
• via three-wire connection	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; one green LED for channel status Qn (SIO mode) and port status Cn (IO-Link mode) per channel
• for channel diagnostics	Yes; red Fn LED

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Technical specifications (continued)

Article number	6AG1137-6BD00-2BA0 SIPLUS ET 200SP CM 4XIO-LINK
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

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Technical specifications (continued)

Article number	6AG1137-6CA00-7BU0 SIPLUS ET 200SP CM DALI
General information	
Product type designation	CM 1xDALI
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Interface types	
DALI	
• Integrated power supply	Yes
- Supply current, min.	160 mA
- Supply current, max.	250 mA
- Can be switched off	Yes
• Cable length, max.	300 m
Protocols	
DALI	
• Standard according to DALI	DALI V2 Multi-Master
- Supported operating devices	
- Fluorescent lamps (device type 0)	Yes
- Emergency lighting with single battery (device type 1)	Yes
- Discharge lamps (device type 2)	Yes
- Low-voltage halogen lamps (device type 3)	Yes
- Incandescent lamps (device type 4)	Yes
- Direct voltage (device type 5)	Yes
- LED modules (device type 6)	Yes
- Switching function (device type 7)	Yes
- Color control (device type 8)	Yes
- Further operating devices	Yes; general device type
- Supported input devices	
- Pushbuttons	Yes
- Absolute input devices	Yes
- Presence detector	Yes
- Light sensor	Yes
- Further input devices	Yes; general device type
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• short-circuit	Yes; On DALI bus
Diagnostics indication LED	
• ERROR LED	Yes
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module

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Technical specifications (continued)

Article number	6AG1137-6CA00-7BU0 SIPLUS ET 200SP CM DALI
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0AA0)
- Use on land craft, rail vehicles and special-purpose vehicles	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; Level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-1200	Yes; FW V4.0 or higher
to SIMATIC S7-1500	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	50 g

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Overview



- For data exchange between an ET 200SP system and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
  - Node / lifeguarding
  - Heartbeat
  - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V15.1 or higher
- CAN connection with push-in terminals
- Integrated CAN bus terminating resistor
- Up to 60 CAN nodes
- 128 receiver and 128 transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Optionally with function block SIMATIC ECC CHAdeMO: Realization of digital communication as basis for conductible DC charging of electric vehicles in line with the CHAdeMO standard

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CM CAN communications module With conformal coating, -40...+60 °C To connect ET 200SP with CAN or CANopen networks CAN 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302 Accessories	**6AG1137-6EA00-2BA0**
Suitable SIPLUS extreme BaseUnits, type A0	
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP CM CAN

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Technical specifications

Article number	6AG1137-6EA00-2BA0 SIPLUS ET 200SP CM CAN
General information	
Product type designation	CM 1x CAN ST
Product function	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface type	CAN according to CiA 303-1
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
• Design of the connection	Push-in terminal
CAN	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	10 kbit/s
• Transmission rate, max.	1 000 kbit/s
• max. number of devices	60
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	128; Send / receive
- Services	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

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Technical specifications (continued)

Article number	6AG1137-6EA00-2BA0 SIPLUS ET 200SP CM CAN
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Decentralized operation	
to SIMATIC S7-300	No
to SIMATIC S7-400	No
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	32 g

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Overview



- PROFIBUS DP device with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 Kbps to 12 Mbps
- Communications services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication:
    This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data record routing

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS CM DP for ET 200SP CPU (Extended temperature range and exposure to environmental substances) PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6AG1545-5DA00-2AB0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	see SIMATIC CM DP

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Technical specifications

Article number	6AG1545-5DA00-2AB0 SIPLUS ET 200SP CM DP
General information	
Product type designation	CM PROFIBUS DP
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125
- Services	
- PG/OP communication	Yes
- Equidistance	No
- Isochronous mode	No
- activation/deactivation of DP devices	Yes
PROFIBUS DP device	
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	Yes
• Address area, max.	120
• User data per address area, max.	128 byte
- Services	
- PG/OP communication	Yes; Only with active interface
- Routing	Yes; Only with active interface
- S7 communication	Yes; Only with active interface
- Direct data exchange (slave-to-slave communication)	Yes; No subscriber possible - only passive publisher
- DPV1	Yes
- Transfer memory	
- Inputs	244 byte
- Outputs	244 byte
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
• Cable length, max.	100 m
Protocols	
SIMATIC communication	
• S7 routing	Yes
• Data record routing	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostics indication LED	
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin

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Technical specifications (continued)

Article number	6AG1545-5DA00-2AB0 SIPLUS ET 200SP CM DP
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	35 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	80 g

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More information

Additional information and downloads

Manuals

The manuals for ET 200SP can be downloaded free of charge from the Internet (SIMATIC Customer Support).
http://support.automation.siemens.com/WW/view/en/84133942

General information

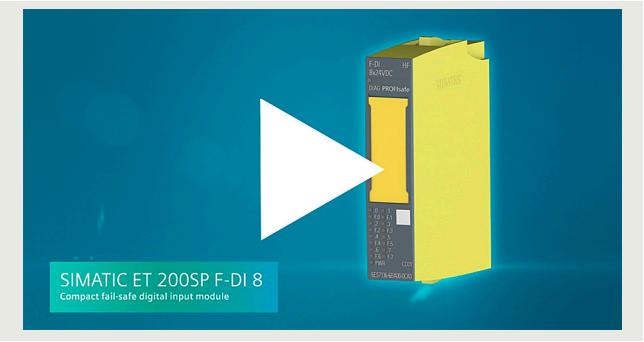
http://www.siemens.com/et200sp

SIMATIC Selection Tool

http://www.siemens.com/tia-selection-tool

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Overview



SIMATIC ET 200SP Safety F-DI video



Digital fail-safe input module:
F-DI 8x24VDC High Feature for BU type A0, color code CC01
Important properties:

- 8-channel digital fail-safe input module for ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integrated discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage, and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DI module type: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.

Overview (continued)

- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

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Selection and ordering data

Digital F-input modules	
F-DI 8x24VDC High Feature, BU type A0, color code CC01	**6ES7136-6BA01-0CA0**
Spare parts	
E-coding elements, type F 5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI	**6ES7193-6EF00-1AA0**
Suitable BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Accessories	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool **Task:** Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP **Requirement:** Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; Email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**

Selection and ordering data (continued)

STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA25-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA25-0YH5**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP01-2MA0**
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	**6ES7193-6CP01-4MA0**
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7136-6BA01-0CA0 ET 200SP, F-DI 8x24V DC HF
General information	
Product type designation	F-DI 8x24VDC HF
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	SIMATIC Safety V20 and V21 or higher with HSP 0484
• STEP 7 configurable/integrated from version	as 6ES7136-6BA00-0CA0
• PROFINET from GSD version/GSD revision	GSDML V2.45
Operating mode	
• DI	Yes
• Counter	Yes; pulse counting, standstill and speed monitoring
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
Digital inputs	
Number of digital inputs	8
Digital inputs, parameterizable	Yes
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Digital input functions, parameterizable	
• Counter	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes
- for technological functions	
- parameterizable	No
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C

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Technical specifications (continued)

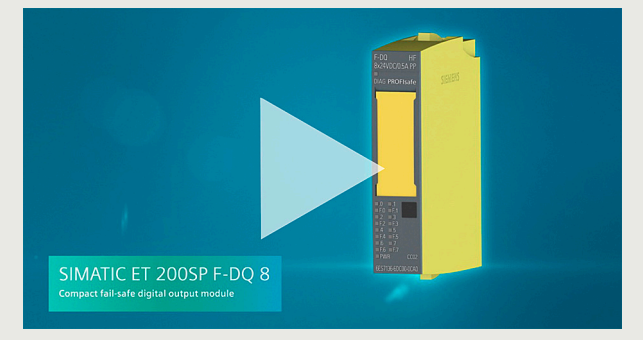
Article number	6ES7136-6BA01-0CA0 ET 200SP, F-DI 8x24V DC HF
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	29 g

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Overview



SIMATIC ET 200SP Safety F-DQ 4 video



SIMATIC ET 200SP Safety F-DQ 8 video



Digital fail-safe output modules:

- F-DQ 4x24VDC/2A PM High Feature
- F-DQ 8x24VDC/0.5A PP High Feature

Important properties:

Overview (continued)

- 4 and 8-channel digital fail-safe output modules for the ET 200SP
- Fail-safe 2-channel activation (switching to P/M potential or switching to P/P potential) of actuators
- Actuators can be controlled up to 2 A or 0.5 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage, and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DQ module type: black
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations
- Can be used with all fail-safe SIMATIC S7 CPUs

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Selection and ordering data

Digital F-output modules	
SIMATIC DP, electronic module for ET 200SP F-DQ 4x24 V DC/2 A, 15 mm width, up to PL e (ISO 13849) up to SIL 3 (IEC 61508)	**6ES7136-6DB00-0CA0**
SIMATIC DP, electronic module ET 200SP F-DQ 4x24 V DC/2 A, 15 mm width, up to PL e (ISO 13849), up to SIL 3 (IEC 61508)	**6ES7136-6DB01-0CA0**
SIMATIC DP, electronic module ET 200SP F-DQ 8x24 V DC/0.5 A PP HF, 15 mm width, up to PL e (ISO 13849) up to SIL 3 (IEC 61508)	**6ES7136-6DC00-0CA0**
Spare parts	
SIMATIC DP, spare part 5 e-coding elements type F For ET 200SP modules F-DI, F-DQ, F-PM-E; 5 units per packing unit	**6ES7193-6EF00-1AA0**
Suitable BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
SIMATIC ET 200SP, BaseUnit BU15-P16+A10+2D BU type A0, push-in terminals, with 10 AUX terminals, new load group, WxH: 15 mm x 141 mm	**6ES7193-6BP20-0DA0**
SIMATIC ET 200SP, BaseUnit BU15-P16+A10+2D, BU type A0, pack quantity: 10 units, push-in terminals, with 10 AUX terminals, new load group, WxH: 15 mm x 141 mm	**6ES7193-6BP20-2DA0**
SIMATIC ET 200SP, BaseUnit BU15-P16+A0+2D BU type A0, push-in terminals, without AUX terminals, new load group, WxH: 15x 117 mm	**6ES7193-6BP00-0DA0**
SIMATIC ET 200SP, BaseUnit BU15-P16+A0+2D BU type A0, pack quantity: 10 units, push-in terminals, without AUX terminals, new load group, WxH: 15x 117 mm	**6ES7193-6BP00-2DA0**
SIMATIC ET 200SP, BaseUnit BU15-P16+A10+2B BU type A0, push-in terminals, with 10 AUX terminals, bridged to the left, WxH: 15 mm x 141 mm	**6ES7193-6BP20-0BA0**
SIMATIC ET 200SP, BaseUnit BU15-P16+A10+2B BU type A0, pack quantity: 10 units, push-in terminals, with 10 AUX terminals, bridged to the left, WxH: 15 mm x 141 mm	**6ES7193-6BP20-2BA0**
SIMATIC ET 200SP, BaseUnit BU15-P16+A0+2B BU type A0, push-in terminals, without AUX terminals, bridged to the left, WxH: 15x 117 mm	**6ES7193-6BP00-0BA0**
SIMATIC ET 200SP, BaseUnit BU15-P16+A0+2B BU type A0, pack quantity: 10 units, push-in terminals, without AUX terminals, bridged to the left, WxH: 15x 117 mm	**6ES7193-6BP00-2BA0**
SIMATIC ET 200SP, BaseUnit BU20-P12+A4+0B BU type B0, push-in terminals, with 4 AUX terminals, bridged to the left, WxH: 20 mm x 117 mm	**6ES7193-6BP20-0BB0**
Accessories	

Selection and ordering data (continued)

S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, floating license for 1 user Engineering software, software and documentation on DVD, Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F	**6ES7833-1FC02-0YA5**
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, floating license for 1 user Software, documentation and license key for download[1)], Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F Consignee email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
SIMATIC S7, F-programming tool S7 Distributed Safety V5.4, upgrade from V5.X to V5.4 Upgrade license for 1 user, engineering software, software and documentation on DVD, Class A, 3 languages (en, de, fr), runs on Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016; 64-bit operating system required; from STEP 7 V5.5 SP1; reference hardware S7-300F/400F/WinAC F	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V21 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco Requirement: STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software; floating license for 1 user License key on USB flash drive; Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F Content: 1x USB	**6ES7833-1FA25-0YA5**

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Selection and ordering data (continued)

SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V21; engineering software, floating license for 1 user License key for download[1] Class A, 2 languages (en, de); runs with TIA Portal V21 STEP 7 Professional V21; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery	**6ES7833-1FA25-0YH5**
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**
Labeling strips	
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	**6ES7193-6LR10-0AA0**
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	**6ES7193-6LR10-0AG0**
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AA0**
SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
SIMATIC ET 200SP, 5 BU covers, 15 mm For protection of vacant slots	**6ES7133-6CV15-1AM0**
SIMATIC ET 200SP, 5 BU covers, 20 mm For protection of vacant slots	**6ES7133-6CV20-1AM0**
SIMATIC ET 200SP, set for 5 shield connections With 5 shield terminals, 5 shield supports, 5 support elements	**6ES7193-6SC20-1AM0**
Color-coded labels	
SIMATIC ET 200SP, 10 color-coded labels color code CC02 For I/O modules, module-specific, for 16 push-in terminals	**6ES7193-6CP02-2MA0**
SIMATIC ET 200SP, 50 color-coded labels, color code CC02 For I/O modules, module-specific, for 16 push-in terminals	**6ES7193-6CP02-4MA0**
SIMATIC ET 200SP, 10 color-coded labels color code CC71 For 10 AUX terminals, for BU type A0, with push-in terminals	**6ES7193-6CP71-2AA0**
SIMATIC ET 200SP, 10 color-coded labels color code CC72 For 10 AUX terminals, for BU type A0, with push-in terminals	**6ES7193-6CP72-2AA0**
SIMATIC ET 200SP, 10 color-coded labels color code CC73 For 10 AUX terminals, for BU type A0, with push-in terminals	**6ES7193-6CP73-2AA0**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7136-6DB00-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DB01-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8x24VDC/0.5A PP HF
General information			
Product type designation	F-DQ 4x24VDC/2A PM HF	F-DQ 4x 24 V DC/2 A PM HF	F-DQ 8x24 V DC/0.5 A PP HF
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	V12	V20 with HSP 470	V14 SP1 with HSP 202
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	as 6ES7136-6DB00-0CA0	V5.5 SP4 HF5
• PROFINET from GSD version/GSD revision	V2.31	GSDML V2.45	V2.31
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Digital outputs			
Type of digital output	Transistor	Transistor	Transistor
Number of digital outputs	4	4	8
Digital outputs, parameterizable	Yes	Yes	Yes
output type acc. to IEC 61131, type 2		Yes	
Short-circuit protection	Yes	Yes	Yes
Open-circuit detection	Yes	Yes	No
Overload protection	Yes	Yes	
Limitation of inductive shutdown voltage to	Typ. -2x 47 V	sourcing output: -39 V DC in relation to 2M, sinking output: +47 V DC in relation to 2M	Typ. -39 V
Controlling a digital input	Yes; digital output, according to IEC 61131-2, type 2	Yes; digital output, according to IEC 61131-2, type 2	Yes; digital output, according to IEC 61131-2, type 0.5
Switching capacity of the outputs			
• with resistive load, max.	2 A	2 A	0.5 A
• with inductive load, max.		2 A	
• on lamp load, max.	10 W	10 W	2 W
Load resistance range			
• lower limit	12 Ω	12 Ω	48 Ω
• upper limit	2 000 Ω	2 000 Ω	12 000 Ω
Output voltage			
• for signal "1", min.	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)
Output current			
• for signal "1" rated value	2 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Switching frequency			
• with resistive load, max.	30 Hz; Symmetrical	30 Hz; Symmetrical	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• with capacitive load, max.		30 Hz; observe chapter "Switching of capacitive loads" in the manual	2 Hz; Symmetrical
• on lamp load, max.	10 Hz; Symmetrical	10 Hz; Symmetrical	10 Hz; Symmetrical
Total current of the outputs			
• Current per channel, max.	2 A; note derating data in the manual	2 A; note derating data in the manual	0.5 A; note derating data in the manual
• Current per module, max.	6 A; note derating data in the manual	6 A; note derating data in the manual	3 A; note derating data in the manual
Total current of the outputs (per module)			
- horizontal installation			
- up to 40 °C, max.			3 A
- up to 50 °C, max.			2.5 A
- up to 60 °C, max.			2 A
- vertical installation			
- up to 50 °C, max.			2 A

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Technical specifications (continued)

Article number	6ES7136-6DB00-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DB01-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8x24VDC/0.5A PP HF
Interrupts/diagnostics/status information			
Diagnostics function	Yes; See Chapter "Alarms/diagnostic messages" in the manual	Yes; See Chapter "Alarms/diagnostic messages" in the manual	Yes; See Chapter "Alarms/diagnostic messages" in the manual
Substitute values connectable	No	No	No
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Hardware interrupt	No	No	No
Diagnostics indication LED			
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety functions	Yes	Yes	Yes
Highest safety class achievable in safety mode			
• Performance level according to ISO 13849-1	PLe	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3	SIL 3
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C	50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	4 000 m; Restrictions for installation altitudes > 2 000 m, see manual	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP System Manual
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	57 g	30 g	48 g

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Overview



The 1 F-RQ digital F electronic module relay DC 24VDC/24.230VAC/5 A has the following characteristics:

- 1 relay output (2 NO contacts)
- Total output current 5 A
- Rated load voltage 24 V DC and 24 ... 230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals

The attainable safety integrity level is SIL 3 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

Selection and ordering data

1 F-RQ digital F-output module relay BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24 ... 230 V AC; can be used up to SIL3/Category 4/PL e if controlled via F-DQ	**6ES7136-6RA00-0BF0**
Suitable BaseUnits	
BU20-P8+A4+0B BU type F0; BaseUnit (dark) with 8 process terminals to the module and 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group	**6ES7193-6BP20-0BF0**
Accessories	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool **Task:** Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP **Requirement:** Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; Email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA25-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA25-0YH5**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units • 20 mm wide	**6ES7133-6CV15-1AM0**

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Selection and ordering data (continued)

Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC42, module-specific; for BaseUnit type F0; 10 units	**6ES7193-6CP42-2MB0**
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7136-6RA00-0BF0 ET 200SP, F-RQ 1x24VDC/24..230VAC/5A ST
General information	
Product type designation	F-RQ 24 ... 48VDC/24 ... 230VAC/5A ST
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V13
• STEP 7 configurable/integrated from version	V5.5 SP4 and higher
• PROFINET from GSD version/GSD revision	V2.31
Supply voltage	
Rated value (DC)	24 V; Coil voltage
Digital outputs	
Type of digital output	Relays
Number of digital outputs	1
Limitation of inductive shutdown voltage to	No
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	5 A
• on lamp load, max.	25 W
Switching frequency	
• with resistive load, max.	2 Hz
• with inductive load, max.	0.1 Hz; See data in manual
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.1 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	2 Hz
Total current of the outputs (per module)	
- horizontal installation	
- up to 40 °C, max.	5 A; note derating data in the manual
- up to 50 °C, max.	4 A; note derating data in the manual
- up to 60 °C, max.	3 A; note derating data in the manual
- vertical installation	
- up to 50 °C, max.	3 A; note derating data in the manual
Relay outputs	
• Number of relay outputs	1; 2 NO contacts
• Rated supply voltage of relay coil L+ (DC)	24 V
• Current consumption of relays (coil current of all relays), max.	70 mA
• external protection for relay outputs	yes; 6 A, see data in manual
• Relay approved acc. to UL 508	Yes; Pilot Duty B300, R300
- Switching capacity of contacts	
- with inductive load, max.	see additional description in the manual
- with resistive load, max.	see additional description in the manual
- Thermal continuous current, max.	5 A
- Switching current, min.	1 mA
- Switching current after exceeding 300 mA, min.	10 mA
- Switching current after exceeding 300 mA, max.	5 A
- Rated switching voltage (DC)	24 V
- Rated switching voltage (AC)	230 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; green/red DIAG LED
• Channel status display	Yes; green LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe

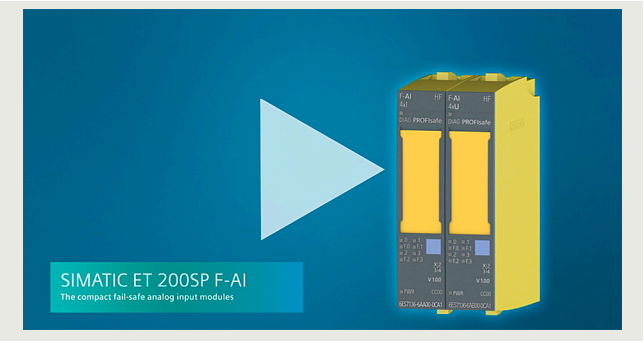
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Technical specifications (continued)

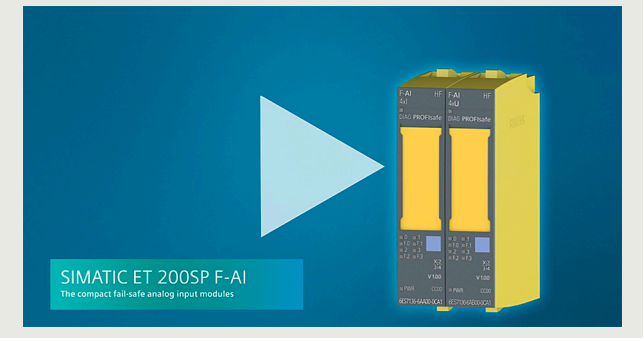
Article number	6ES7136-6RA00-0BF0 ET 200SP, F-RQ 1x24VDC/24..230VAC/5A ST
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	56 g

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Overview



SIMATIC ET 200SP Safety F-AI-4xU video



SIMATIC ET 200SP Safety F-AI-4xI video



Analog fail-safe input modules:

- F-AI 4xI 0(4)..20 mA 2/4-wire High Feature for BU types A0 and A1, color code CC00
- F-AI 4xU 0..10 V HF, BU type A0, A1, color code CC00

Important properties:

Overview (continued)

- 4-channel analog fail-safe digital inputs for ET 200SP
- 4 analog inputs with galvanic isolation between channels and backplane bus
- Measuring ranges: (0)4...20 mA and 0..10 V
- Possibility of connecting current and voltage sensors for measuring temperature, pressure, flow, level, distance measurement, etc.
- Short-circuit-proof power supply for analog sensors
- Resolution: 16 bits including sign
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged onto type A0 and A1 BaseUnits (BU)
- LED display for error, operation, supply voltage, and status
- Interference frequency suppression, smoothing
- Diagnostics: wire break, short-circuit, high/low limit violation
- Firmware update
- Identification data I&M
- Value status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DI module type: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

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Selection and ordering data

Analog F-input module	
F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature, BU type A0, A1, color code CC00	**6ES7136-6AA00-0CA1**
F-AI 4xU 0..10 V High Feature, BU type A0, A1, color code CC00	**6ES7136-6AB00-0CA1**
Spare parts	
E-coding elements, type F 5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI	**6ES7193-6EF00-1AA0**
5x e-coding elements, type H 5 units, for ET 200SP F-AI 4xU, F-TM Count, F-CM AS-i	**6ES7193-6EH00-1AA0**
Suitable BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	**6ES7193-6BP40-0DA1**
BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6ES7193-6BP00-0DA1**
BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	**6ES7193-6BP40-0BA1**
BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6ES7193-6BP00-0BA1**
Accessories	

Selection and ordering data (continued)

STEP 7 Safety Advanced V21 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco Requirement: STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA25-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA25-0YH5**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); A1; 10 units	**6ES7193-6CP00-2MA0**
• Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16), A1; 50 units	**6ES7193-6CP00-4MA0**

[1] Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7136-6AA00-0CA1 ET 200SP, F-AI 4XI 0(4)..20mA HF	6ES7136-6AB00-0CA1 ET 200SP, F-AI 4xU 0..10V HF
General information		
Product type designation	F-AI 4xI 0(4)..20mA 2-/4-wire HF	F-AI 4XU 0..10V HF
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V15 with HSP 203	V16 with HSP 308
Operating mode		
• cyclic measurement		Yes
• Oversampling		No
• MSI		No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Analog inputs		
Number of analog inputs	4	4
• For current measurement	4	
• For voltage measurement		4
permissible input voltage for voltage input (destruction limit), max.		36 V
permissible input current for current input (destruction limit), max.	35 mA	
Input ranges (rated values), voltages		
• 0 to +10 V		Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
Cable length		
• shielded, max.	1 000 m	200 m
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	20 / 16,667	20 / 16,667
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz	50 / 60 Hz
Smoothing of measured values		
• Number of smoothing levels	7	7
• Parameterizable	Yes	Yes
• Average value filter		Yes
Encoder		
Connection of signal encoders		
• for voltage measurement		Yes
• for current measurement as 2-wire transducer	Yes	
- Burden of 2-wire transmitter, max.	650 Ω	
• for current measurement as 4-wire transducer	Yes	
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)		0.1 %
• Current, relative to input range, (+/-)	0.1 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• Common mode voltage, max.		10 V
• Common mode interference, min.	70 dB	70 dB
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes

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Technical specifications (continued)

Article number	6ES7136-6AA00-0CA1 ET 200SP, F-AI 4XI 0(4)..20mA HF	6ES7136-6AB00-0CA1 ET 200SP, F-AI 4xU 0..10V HF
• Limit value alarm	No	No
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
• short-circuit	Yes	
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C
Dimensions		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	48 g	48 g

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Overview



SIMATIC ET 200SP Safety F-PM-E video



Digital fail-safe power module:
F-PM-E PPM 24 V DC/8A for BU type C0, color code CC52
Important properties:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (switching to PPM potential, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply switching to PP or PM potential can be parameterized
- Parameterizable onboard evaluation of the fail-safe inputs for control of the fail-safe digital outputs and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage, and status

Overview (continued)

- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DI module type: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

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Selection and ordering data

F-PM-E 24 VDC/8A PPM Standard digital F power module BU type C0, color code CC52. 2 inputs, 1 output, SIL 3/Cat. 4/PL e	**6ES7136-6PA00-0BC0**
Spare parts	
E-coding elements, type F 5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI	**6ES7193-6EF00-1AA0**
Suitable BaseUnits	
Type C0 BaseUnits	
BU20-P6+A2+4D BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and 2 AUX terminals; new load group	**6ES7193-6BP20-0DC0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC52, module-specific, for 8 push-in terminals; 10 units	**6ES7193-6CP52-2MC0**
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type A	**6ES7193-6KA00-3AA0**
Type B	**6ES7193-6KB00-3AA0**
Type C	**6ES7193-6KC00-3AA0**
Type D	**6ES7193-6KD00-3AA0**

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Technical specifications

Article number	6ES7136-6PA00-0BC0 ET 200SP, F-PM-E PPM, 24V DC
General information	
Product type designation	F-PM-E 24 V DC/8 A PPM ST
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V12
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFINET from GSD version/GSD revision	V2.31
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	2
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 2.1 A)
Output current	
• up to 60 °C, max.	0.3 A
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	600 mA; Total current of all encoders
Digital inputs	
Number of digital inputs	2
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes
- for technological functions	
- parameterizable	No
Digital outputs	
Number of digital outputs	1
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	Max. -1.5 V
Switching capacity of the outputs	
• with resistive load, max.	8 A
• on lamp load, max.	100 W
Load resistance range	
• lower limit	3 Ω
• upper limit	2 000 Ω
Output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
Output current	
• for signal "1" rated value	8 A
• for signal "0" residual current, max.	1.5 mA; PP-switching: max. 1.5 mA; PM-switching: max. 1 mA
Switching frequency	

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Technical specifications (continued)

Article number	6ES7136-6PA00-0BC0 ET 200SP, F-PM-E PPM, 24V DC
• with resistive load, max.	10 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• on lamp load, max.	4 Hz; Symmetrical
Total current of the outputs	
• Current per channel, max.	8 A; note derating data in the manual
• Current per module, max.	8 A; note derating data in the manual
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	500 m
Interrupts/diagnostics/status information	
Diagnostics function	Yes; See Chapter "Alarms/diagnostic messages" in the manual
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
- Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL2	< 2.00E-04
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL2	< 1.00E-08 1/h
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP System Manual
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	70 g

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Overview



Fail-safe technology module:
F-TM Count, 1x1Vpp sin/cos High Feature for BU type A0, color code CC00

Important properties:

- Technological, fail-safe counter module for ET 200SP
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- 1x sin/cos interface for recording sin/cos differential encoder signals A, A/, B, B/, N and N/
- Option to connect sin/cos differential encoders
- Short-circuit-proof 5 V DC encoder supply
- High-speed count input up to 200 kHz
- Counting range: 32-bit (-2.147.483.648 to +2.147.483.647)
- SW gate for counter control
- Measured values:
  - Speed
  - Frequency
  - Period duration
- Integrated safety functions:
  - SOS (Safe Operation Stop)
  - SLS (Safely Limited Speed)
  - SDI (Safe Direction)
- Can be plugged onto type A0 BaseUnits (BU)
- LED display for error, operation, supply voltage, and status
- Monitoring of encoder signals for wire break, short-circuit and signal strength
- Firmware update
- Identification data I&M
- Value status

Overview (continued)

- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories:
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

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Selection and ordering data

F-TM Count fail-safe technology module	
1 x 1Vpp sin/cos High Feature, BU type A0, color code CC00	**6ES7136-6CB00-0CA0**
Spare parts	
E-coding elements, type H 5 units, for ET 200SP F-AI 4xU, F-TM Count, F-CM AS-i	**6ES7193-6EH00-1AA0**
Suitable BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Accessories	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool **Task:** Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP **Requirement:** Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; Email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**

Selection and ordering data (continued)

STEP 7 Safety Advanced V21 **Task:** Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA25-0YA5**
Floating license for 1 user, license key for download[1]; Email address required for delivery	**6ES7833-1FA25-0YH5**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP01-2MA0**
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	**6ES7193-6CP01-4MA0**
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**

1) Up-to-date information and download availability can be found at this link.

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Technical specifications

Article number	6ES7136-6CB00-0CA0 ET 200SP, F-TM Count 1x1Vpp sin/cos HF
General information	
Product type designation	F-TM Count 1x1Vpp sin/cos HF
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	Step 7 V17 or higher: use GSDML for prior versions
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
5 V encoder supply	
• 5 V	Yes; 5.1 V ±3.5 %
• Short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	1; (counter input)
Digital inputs, parameterizable	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Counter for incremental encoder	Yes
Input voltage	
• Type of input voltage	sin/cos 1 Vpp
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	2.5 µs for parameterization "none"
- for technological functions	
- parameterizable	Yes
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; up to 200 kHz depending on cable type and length
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	1 Vpp, centered at 2.5 V offset
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	150 m
• Incremental encoder with A/B tracks, 90° phase offset	Yes; sin/cos
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes; sin/cos/zero
Interrupts/diagnostics/status information	
Diagnostics function	Yes; see chapter "Diagnostic Messages" in the manual
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED

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Technical specifications (continued)

Article number	6ES7136-6CB00-0CA0 ET 200SP, F-TM Count 1x1Vpp sin/cos HF
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	800 kHz; with quadruple evaluation
Safety monitoring functions	
• Safe Operating Stop (SOS)	Yes
• Safely-Limited Speed (SLS)	Yes
• Safe Direction (SDI)	Yes
• Safe Speed Monitor (SSM)	Yes
Counting functions	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Software gate	Yes
• Counting range, parameterizable	Yes
Measuring functions	
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz; with quadruple evaluation
- Cycle duration measurement, min.	1 µs
- Cycle duration measurement, max.	25 s
- Velocity measurement, min.	0 (speed in configured units per selected time basis - speed*1 000)
- Velocity measurement, max.	2 147 483 (speed in configured units per selected time basis - speed*1 000)
- Accuracy	
- Frequency measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
- Cycle duration measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
- Velocity measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Cat. 4, PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	42 g

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Overview



Digital fail-safe input module:
F-DI 8x24 V DC High Feature for BU type A0, color code CC01
Important properties:

- 8-channel digital fail-safe input module for the ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS digital F-input modules (Extended temperature range and exposure to environmental substances) F-DI 8x24VDC High Feature, BU type A0, color code CC01 -40...+60 °C	**6AG1136-6BA01-2CA0**
Suitable BaseUnits	
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, Digital F-input modules

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Technical specifications

Article number	6AG1136-6BA01-2CA0 SIPLUS ET 200SP F-DI 4/8x24VDC HF
General information	
Product type designation	F-DI 8x24VDC HF
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Operating mode	
• DI	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
Digital inputs	
Number of digital inputs	8
Digital inputs, parameterizable	Yes
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes
- for technological functions	
- Parameterizable	No
Interrupts/diagnostics/status information	
Diagnostics function	Yes; See Chapter "Alarms/diagnostic messages" in the manual
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax

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Technical specifications (continued)

Article number	6AG1136-6BA01-2CA0 SIPLUS ET 200SP F-DI 4/8x24VDC HF
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	29 g

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Overview



Digital fail-safe output module:
F-DQ 4x24VDC High Feature, BU type A0, color code CC01
Important properties:

- 4-channel digital fail-safe output module for the ET 200SP
- Fail-safe 2-channel activation (sinking/sourcing output) by actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage, and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DI module type: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations
- Can be used with all fail-safe SIMATIC S7 CPUs

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS digital F-output modules (Extended temperature range and exposure to environmental substances)	
F-DQ 4x24VDC PM HF	**6AG1136-6DB00-2CA0**
F-DQ 4x24VDC/2A PM HF	**6AG1136-6DB01-2CA0**
F-DQ 8x24VDC PP HF	**6AG1136-6DC00-2CA0**
Suitable BaseUnits	
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
BU20-P12+A4+0B (Extended temperature range and exposure to environmental substances) BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group; 1 unit	**6AG1193-6BP20-7BB0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, Digital F-output modules

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Technical specifications

Article number	6AG1136-6DB00-2CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	6AG1136-6DC00-2CA0 SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF	6AG1136-6DB01-2CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF
General information			
Product type designation	F-DQ 4x24VDC HF	F-DQ 8x24VDC/0.5A PP HF	F-DQ 4x 24 V DC/2 A PM HF
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275	see entry ID: 109746275
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Digital outputs			
Type of digital output	Transistor	Transistor	Transistor
Number of digital outputs	4	8	4
Digital outputs, parameterizable	Yes	Yes	Yes
output type acc. to IEC 61131, type 2			Yes
Short-circuit protection	Yes	Yes	Yes
Open-circuit detection	Yes	No	Yes
Overload protection	Yes		Yes
Limitation of inductive shutdown voltage to	typ. 2*47V	Typ. -39 V	sourcing output: -39 V DC in relation to 2M, sinking output: +47 V DC in relation to 2M
Controlling a digital input	Yes; digital output, according to IEC 61131-2, type 2	Yes; digital output, according to IEC 61131-2, type 0.5	Yes; digital output, according to IEC 61131-2, type 2
Switching capacity of the outputs			
• with resistive load, max.	2 A	0.5 A	2 A
• with inductive load, max.			2 A
• on lamp load, max.	10 W	2 W	10 W
Load resistance range			
• lower limit	12 Ω	48 Ω	12 Ω
• upper limit	2 000 Ω	12 000 Ω	2 000 Ω
Output voltage			
• for signal "1", min.	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)
Output current			
• for signal "1" rated value	2 A	0.5 A	2 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Switching frequency			
• with resistive load, max.	30 Hz; Symmetrical	30 Hz; Symmetrical	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• with capacitive load, max.		2 Hz; Symmetrical	30 Hz; observe chapter "Switching of capacitive loads" in the manual
• on lamp load, max.	10 Hz; Symmetrical	10 Hz; Symmetrical	10 Hz; Symmetrical
Total current of the outputs			
• Current per channel, max.	2 A; note derating data in the manual	0.5 A; note derating data in the manual	2 A; note derating data in the manual
• Current per module, max.	6 A; note derating data in the manual	3 A; note derating data in the manual	6 A; note derating data in the manual
Total current of the outputs (per module)			
- horizontal installation			
- up to 40 °C, max.	6 A; note derating data in the manual	3 A; note derating data in the manual	
- up to 50 °C, max.	5 A; note derating data in the manual	2.5 A; note derating data in the manual	
- up to 60 °C, max.	4 A; note derating data in the manual	2 A; note derating data in the manual	
- up to 70 °C, max.	4 A; note derating information in the manual; only with configured slots to the left and right of the module	2 A; note derating information in the manual; only with configured slots to the left and right of the module	
- vertical installation			

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Technical specifications (continued)

Article number	6AG1136-6DB00-2CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	6AG1136-6DC00-2CA0 SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF	6AG1136-6DB01-2CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF
- up to 50 °C, max.	4 A; note derating data in the manual	2 A; note derating data in the manual	
Interrupts/diagnostics/status information			
Diagnostics function	Yes; See Chapter "Alarms/diagnostic messages" in the manual	Yes; See Chapter "Alarms/diagnostic messages" in the manual	Yes; See Chapter "Alarms/diagnostic messages" in the manual
Substitute values connectable	No	No	No
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Hardware interrupt	No	No	No
Diagnostics indication LED			
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety functions	Yes	Yes	Yes
Highest safety class achievable in safety mode			
• Performance level according to ISO 13849-1	PLe	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3	SIL 3
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)	-30 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin	-30 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust

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Technical specifications (continued)

Article number	6AG1136-6DB00-2CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	6AG1136-6DC00-2CA0 SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF	6AG1136-6DB01-2CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-3-6AB00-0AA0)
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193--6AB00-0AA0)
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	57 g	48 g	30 g

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Overview



The 1 F-RQ digital F electronic module relay DC 24VDC/24.230VAC/5 A has the following characteristics:

- 1 relay output (2 NO contacts)
- Total output current 5 A
- Rated load voltage 24 V DC and 24 ... 230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals

The attainable safety integrity level is SIL 3 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS 1 F-RQ digital F-output module relay (Extended temperature range and exposure to environmental substances) BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24 ... 230 V AC; can be used up to SIL3/Category 4/PL e if controlled via F-DQ	**6AG1136-6RA00-2BF0**
Suitable BaseUnits	
BU20-P8+A4+0B (Extended temperature range and exposure to environmental substances) BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group	**6AG1193-6BP20-2BF0**
Accessories	See SIMATIC ET 200SP, Digital F-output module relay

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Technical specifications

Article number	6AG1136-6RA00-2BF0 SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
General information	
Product type designation	F-RQ 1x24 V DC/24 ... 230 V AC/5 A
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Digital outputs	
Type of digital output	Relays
Number of digital outputs	1
Limitation of inductive shutdown voltage to	No
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	5 A
• on lamp load, max.	25 W
Switching frequency	
• with resistive load, max.	2 Hz
• with inductive load, max.	0.1 Hz; See data in manual
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.1 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	2 Hz
Total current of the outputs (per module)	
- horizontal installation	
- up to 40 °C, max.	5 A; note derating data in the manual
- up to 50 °C, max.	4 A; note derating data in the manual
- up to 60 °C, max.	3 A; note derating data in the manual
- up to 70 °C, max.	3 A; note derating information in the manual; only with configured slots to the left and right of the module
- vertical installation	
- up to 50 °C, max.	3 A; note derating data in the manual
Relay outputs	
• Number of relay outputs	1; 2 NO contacts
• Rated supply voltage of relay coil L+ (DC)	24 V
• Current consumption of relays (coil current of all relays), max.	70 mA
• external protection for relay outputs	yes; 6 A, see data in manual
• Relay approved acc. to UL 508	Yes; Pilot Duty B300, R300
- Switching capacity of contacts	
- with inductive load, max.	see additional description in the manual
- with resistive load, max.	see additional description in the manual
- Thermal continuous current, max.	5 A
- Switching current, min.	1 mA
- Switching current after exceeding 300 mA, min.	10 mA
- Switching current after exceeding 300 mA, max.	5 A
- Rated switching voltage (DC)	24 V
- Rated switching voltage (AC)	230 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; green/red DIAG LED
• Channel status display	Yes; green LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe

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Technical specifications (continued)

Article number	6AG1136-6RA00-2BF0 SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	90 g

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Overview



Analog fail-safe input module:
SIPLUS F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature for BU type A0 and A1, color code CC00

F-AI 4xU 0..10 V High Feature, BU type A0, A1, color code CC00

Important properties:

- 4 analog inputs with galvanic isolation between channels and backplane bus (up to SIL 3/Cat. 4/PL d)
- Short-circuit-proof power supply of 2 or 4-wire transducers
- Measuring ranges: 0 ... 20 mA and 4 ... 20 mA
- Resolution: 16 bits including sign
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged onto type A0 and A1 BaseUnits (BU)
- LED display for error, operation, supply voltage, and status
- Interference frequency suppression, smoothing
- Diagnostics: wire break, short-circuit, high/low limit violation
- Firmware update
- Identification data I&M
- Value status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DI module type: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection

Overview (continued)

- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS analog F-input module (Extended temperature range and exposure to environmental substances)	
F-AI 4xI 0(4) ... 20 mA 2-/4-wire High Feature, BU type A0, A1, color code CC00	**6AG1136-6AA00-2CA1**
F-AI 4xU 0..10 V High Feature, BU type A0, A1, color code CC00	**6AG1136-6AB00-2CA1**
Suitable BaseUnits	
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A0+12D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	**6AG1193-6BP40-7DA1**
BU15-P16+A0+2D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA1**
BU15-P16+A0+12B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	**6AG1193-6BP40-7BA1**
BU15-P16+A0+2B/T (Extended temperature range and exposure to environmental substances)	**6AG1193-6BP00-7BA1**

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Selection and ordering data (continued)

BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
Accessories	
SIPLUS Mounting Kit ET 200SP Mounting accessories for use with increased mechanical vibration and shock loads.	**6AG1193-6AA00-0AA0**
Other accessories	See SIMATIC ET 200SP, Analog F-input modules

Technical specifications

Article number	6AG1136-6AA00-2CA1 SIPLUS ET 200SP F-AI 4xI 2-/4-wire HF	6AG1136-6AB00-2CA1 SIPLUS ET 200SP F-AI 4xU 0..10V HF
General information		
Product type designation	F-AI 4xI 0(4)..20mA 2-/4-wire HF	F-AI 4XU 0..10V HF
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Operating mode		
• cyclic measurement		Yes
• Oversampling		No
• MSI		No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Analog inputs		
Number of analog inputs	4	4
• For current measurement	4	
• For voltage measurement		4
permissible input voltage for voltage input (destruction limit), max.		36 V
permissible input current for current input (destruction limit), max.	35 mA	
Input ranges (rated values), voltages		
• 0 to +10 V		Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
Cable length		
• shielded, max.	1 000 m	200 m
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	20 / 16,667	20 / 16,667
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz	50 / 60 Hz
Smoothing of measured values		
• Number of smoothing levels	7	7
• Parameterizable	Yes	Yes
• Average value filter		Yes
Encoder		
Connection of signal encoders		
• for voltage measurement		Yes
• for current measurement as 2-wire transducer	Yes	
- Burden of 2-wire transmitter, max.	650 Ω	
• for current measurement as 4-wire transducer	Yes	
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		

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Technical specifications (continued)

Article number	6AG1136-6AA00-2CA1 SIPLUS ET 200SP F-AI 4xI 2-/4-wire HF	6AG1136-6AB00-2CA1 SIPLUS ET 200SP F-AI 4xU 0..10V HF
• Voltage, relative to input range, (+/-)		0.1 %
• Current, relative to input range, (+/-)	0.1 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• Common mode voltage, max.		10 V
• Common mode interference, min.	70 dB	70 dB
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	No	No
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
• short-circuit	Yes	
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

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Technical specifications (continued)

Article number	6AG1136-6AA00-2CA1 SIPLUS ET 200SP F-AI 4xI 2-/4-wire HF	6AG1136-6AB00-2CA1 SIPLUS ET 200SP F-AI 4xU 0..10V HF
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	48 g	48 g

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Overview



Digital fail-safe power module:
F-PM-E PPM 24 V DC/8A for BU type C0, color code CC52
Important properties:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (switching to PPM potential, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply switching to PP or PM potential can be parameterized
- Parameterizable onboard evaluation of the fail-safe inputs for control of the fail-safe digital outputs and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage, and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DI module type: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations.

Overview (continued)

- Can be used with all fail-safe SIMATIC S7 CPUs.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS F-PM-E 24VDC/8A PPM Standard digital F-power module (Extended temperature range and exposure to environmental substances) BU type C0, color code CC52. 2 inputs, 1 output, SIL 3/Cat. 4/PL e	**6AG1136-6PA00-2BC0**
Type C0 BaseUnits	
BU20-P6+A2+4D (Extended temperature range and exposure to environmental substances) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and 2 AUX terminals; new load group	**6AG1193-6BP20-7DC0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, Fail-safe special modules

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Technical specifications

Article number	6AG1136-6PA00-2BC0 SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
General information	
Product type designation	F-PM-E 24 V DC/8 A PPM ST
based on	6ES7136-6PA00-0BC0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	2
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 2.1 A)
Output current	
• up to 60 °C, max.	0.3 A
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	600 mA; Total current of all encoders
Digital inputs	
Number of digital inputs	2
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes
- for technological functions	
- Parameterizable	No
Digital outputs	
Number of digital outputs	1
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	max. 1.5 V
Switching capacity of the outputs	
• with resistive load, max.	8 A
• on lamp load, max.	100 W
Load resistance range	
• lower limit	3 Ω
• upper limit	2 000 Ω
Output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
Output current	
• for signal "1" rated value	8 A
• for signal "0" residual current, max.	1.5 mA; PP-switching: max. 1.5 mA; PM-switching: max. 1 mA
Switching frequency	
• with resistive load, max.	10 Hz; Symmetrical

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Technical specifications (continued)

Article number	6AG1136-6PA00-2BC0 SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• on lamp load, max.	4 Hz; Symmetrical
Total current of the outputs	
• Current per channel, max.	8 A; note derating data in the manual
• Current per module, max.	8 A; note derating data in the manual
Total current of the outputs (per module)	
- horizontal installation	
- up to 40 °C, max.	8 A; note derating data in the manual
- up to 50 °C, max.	6 A; note derating data in the manual
- up to 60 °C, max.	4 A; note derating data in the manual
- up to 70 °C, max.	4 A; note derating information in the manual; only with configured slots to the left and right of the module
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	500 m
Interrupts/diagnostics/status information	
Diagnostics function	Yes; See Chapter "Alarms/diagnostic messages" in the manual
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
- Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL2	< 2.00E-04
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL2	< 1.00E-08 1/h
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	

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Technical specifications (continued)

Article number	6AG1136-6PA00-2BC0 SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	20 mm
Height	72 mm
Depth	55 mm
Weights	
Weight, approx.	70 g

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Overview



Fail-safe technology module:
F-TM Count, 1x1Vpp sin/cos High Feature for BU type A0, color code CC00

Important properties:

- Technological, fail-safe counter module for ET 200SP
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- 1x sin/cos interface for recording sin/cos differential encoder signals A, A/, B, B/, N and N/
- Option to connect sin/cos differential encoders
- Short-circuit-proof 5 V DC encoder supply
- High-speed counting input up to 200 kHz
- Counting range: 32-bit (-2,147,483,648 to +2,147,483,647)
- SW gate for counter control
- Measured values:
  - Speed
  - Frequency
  - Cycle duration
- Integrated safety functions:
  - SOS (Safe Operation Stop)
  - SLS (Safely Limited Speed)
  - SDI (Safe Direction)
- Can be plugged onto type A0 BaseUnits (BU)
- LED display for error, operation, supply voltage and status
- Monitoring of encoder signals for wire break, short-circuit and signal strength
- Firmware update
- Identification data I&M
- Value status

Overview (continued)

- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories:
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

SIPLUS fail-safe technology module SIPLUS ET 200SP T_TM Count HF (Extended temperature range and exposure to environmental substances) 1x1 Vpp sin/cos HF, PROFIsafe, 1 channel, for incremental rotary encoders, sin/cos 1 Vpp, suitable for BU type A0, pack quantity: 1 unit Ambient temperature -25...+60 °C	**6AG1136-6CB00-2CA0**
BaseUnits type A0	
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; push-in terminals, without AUX terminals, bridged to the left	**6AG1193-6BP00-7BA0**
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; push-in terminals, without AUX terminals, new load group	**6AG1193-6BP00-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; push-in terminals, with 10 AUX terminals, bridged to the left	**6AG1193-6BP20-7BA0**
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; push-in terminals, with 10 AUX terminals, new load group	**6AG1193-6BP20-7DA0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP, fail-safe technology modules

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Technical specifications

Article number	6AG1136-6CB00-2CA0 SIPLUS ET 200SP F-TM Count HF
General information	
Product type designation	F-TM Count 1x1Vpp sin/cos HF
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
5 V encoder supply	
• 5 V	Yes; 5.1 V ±3.5 %
• Short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	1; (counter input)
Digital inputs, parameterizable	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Counter for incremental encoder	Yes
Input voltage	
• Type of input voltage	sin/cos 1 Vpp
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	2.5 µs for parameterization "none"
• Minimum pulse width for program reactions	2.5 µs
- for technological functions	
- Parameterizable	Yes
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; up to 200 kHz depending on cable type and length
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	1 Vpp, centered at 2.5 V offset
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	150 m
• Incremental encoder with A/B tracks, 90° phase offset	Yes; sin/cos
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes; sin/cos/zero
Interrupts/diagnostics/status information	
Diagnostics function	Yes; see chapter "Diagnostic Messages" in the manual
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• short-circuit	Yes
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED

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Technical specifications (continued)

Article number	6AG1136-6CB00-2CA0 SIPLUS ET 200SP F-TM Count HF
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	800 kHz; with quadruple evaluation
Safety monitoring functions	
• Safe Operating Stop (SOS)	Yes
• Safely-Limited Speed (SLS)	Yes
• Safe Direction (SDI)	Yes
• Safe Speed Monitor (SSM)	Yes
Counting functions	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Software gate	Yes
• Counting range, parameterizable	Yes
Measuring functions	
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz; with quadruple evaluation
- Cycle duration measurement, min.	1 µs
- Cycle duration measurement, max.	25 s
- Velocity measurement, min.	0 (speed in configured units per selected time basis - speed*1 000)
- Velocity measurement, max.	2 147 483 (speed in configured units per selected time basis - speed*1 000)
- Accuracy	
- Frequency measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
- Cycle duration measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
- Velocity measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Cat. 4, PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-25 °C; = Tmin
• vertical installation, max.	55 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	On request: Installation altitudes greater than 2 000 m
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

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Technical specifications (continued)

Article number	6AG1136-6CB00-2CA0 SIPLUS ET 200SP F-TM Count HF
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	42 g

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Overview



F-CM AS-i Safety ST for SIMATIC ET 200SP

More information

Equipment Manual, **see** https://support.industry.siemens.com/cs/ww/en/view/90265988

SIMATIC ET200SP Manual Collection, **see** https://support.industry.siemens.com/cs/ww/en/view/84133942

Diagnostics blocks with visualization, **see** https://support.industry.siemens.com/cs/ww/en/view/109479103

Released combinations of the AS-i modules for ET 200SP, **see** https://support.industry.siemens.com/cs/ww/en/view/103624653

AS-Interface I/O modules and other AS-Interface system components, **see** Catalog IC 10

For more information, **see** www.siemens.com/as-interface

The F-CM AS-i Safety ST fail-safe communications module supplements an AS-Interface network without additional wiring to produce a safety-related AS-i network.

Important features:

- Fail-safe communications module for the ET 200SP
  - 31 fail-safe input channels in the process image
  - 16 fail-safe output channels in the process image
  - Certified up to SIL 3 (IEC 62061)/PL e (ISO 13849-1)
  - Parameterization conforms with other Failsafe I/O modules of the ET 200SP
- The communications module supports PROFIsafe in PROFINET and PROFIBUS configurations. Can be used with fail-safe SIMATIC S7-400F CPUs and S7-1500F CPUs and also the Failsafe versions of the ET 200SP station with ET 200SP F-CPU 1510SP F, 1512SP F, 1514SP F or 1515SP PC F.
- For reading up to 31 fail-safe AS-i input slaves
  - Two sensor inputs/signals for each fail-safe AS-i input slave
  - Adjustable evaluation of sensor signals: 2-channel or 2 x 1-channel
  - Integrated discrepancy evaluation in the case of 2-channel signals
  - Integrated AND operation in the case of 2 x 1-channel signals
  - Input delay configurable
  - Start-up test can be set
  - Sequence monitoring can be activated

Overview (continued)

- For control of up to 16 fail-safe AS-i output circuit groups
  - The output circuit groups are controlled independently of one another.
  - One output circuit group can act on one or more actuators (e.g. to switch drives simultaneously).
  - The F-CM AS-i Safety ST module sends the switching command of the output circuit group to the AS-i cable. A safe AS-i output module installed anywhere on the AS-i cable receives the switching command and switches the actuator (e.g. contactor) connected to it.
  - Simple fault acknowledgment via the process image
- Simple module replacement thanks to automatic importing of the safety parameters from the coding element
- Comprehensive diagnostics options
- Can be plugged onto type C1 or type C0 BaseUnits (BU)
- Informative automatic alarm indications
- Supply via AS-Interface voltage
- Eight LED displays for diagnostics, operating state, fault indication and supply voltage
- Informative module inscription on the front
  - Plain-text marking of the module type and function class
  - 2D matrix code (Article No. and serial number)
  - Circuit diagram
  - Color coding module type communications module: light gray
  - Hardware and firmware version
  - Supported BaseUnit type BU: C1, C0

Design

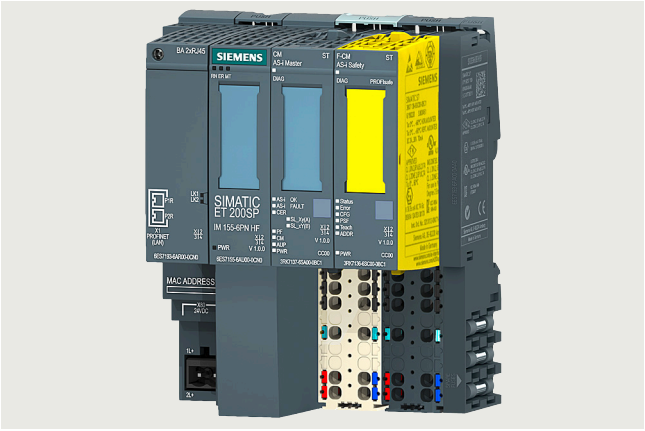
The fail-safe F-CM AS-i Safety ST module has an ET 200SP module enclosure with a width of 20 mm.

One AS-i master according to the AS-i specification V3.0 and safe AS-i input slaves and/or safe AS-i output modules are needed for operation. The CM AS-i Master ST communications module (article number 3RK7137-6SA00-0BC1) is recommended as the AS-i master for the ET 200SP, see CM AS-i Master ST for SIMATIC ET 200SP.

Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-related gateway between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion.

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Overview (continued)



Combination of an ET 200SP interface module, CM AS-i Master ST and F-CM AS-i Safety ST

With the digital and analog I/O modules of the ET 200SP, additional local inputs and outputs can be realized so as to ensure that the modular AS-i gateway complies precisely with customer requirements. Expansion versions for almost every application are possible thanks to the selection of standard and Failsafe I/O modules.

Besides the single AS-i master, double, triple or generally multi-masters can be implemented with or without Failsafe functionality.

Suitable BaseUnits

With the combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules, the CM module is plugged onto a light type C0 BaseUnit and, immediately to the right of it, the F-CM module is plugged onto a dark type C1 BaseUnit. The AS-i cable is connected only on the light BaseUnit of the CM module.

Notes on security:

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see www.siemens.com/cybersecurity-industry.

Configuration

The following software is required for configuration of the F-CM AS-i Safety ST module:

- STEP 7 (TIA Portal) and Safety Advanced

or

- STEP 7 (Classic) and Distributed Safety or F-Configuration Pack SP11 or SIMATIC S7 F/FH systems

In other PROFIsafe-enabled systems, configuration via GSD is possible.

Configuration and programming are done entirely in the STEP 7 user interface. No additional configuration software is needed for commissioning.

Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

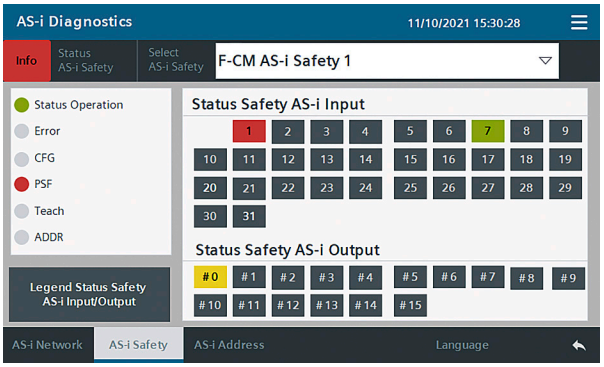
The input and output channels are assigned to the process image automatically and manual linking via configuration blocks is not necessary.

If the F-CM AS-i Safety ST module is replaced, all necessary settings are automatically imported into the new module.

Overview (continued)

The F-CM AS-i Safety ST module occupies 16 input bytes and 8 output bytes in the I/O data of the ET 200SP station.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI Panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/109479103.



Diagnostics block for F-CM AS-i Safety ST

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Application

Thanks to use of the fail-safe module in the ET 200SP, it is possible to fulfill the safety-related application requirements in a manner that is integrated in the overall automation solution.

The safety functions required for fail-safe operation are integrated in the modules. Communication with the fail-safe SIMATIC S7 CPUs is realized via PROFIsafe.

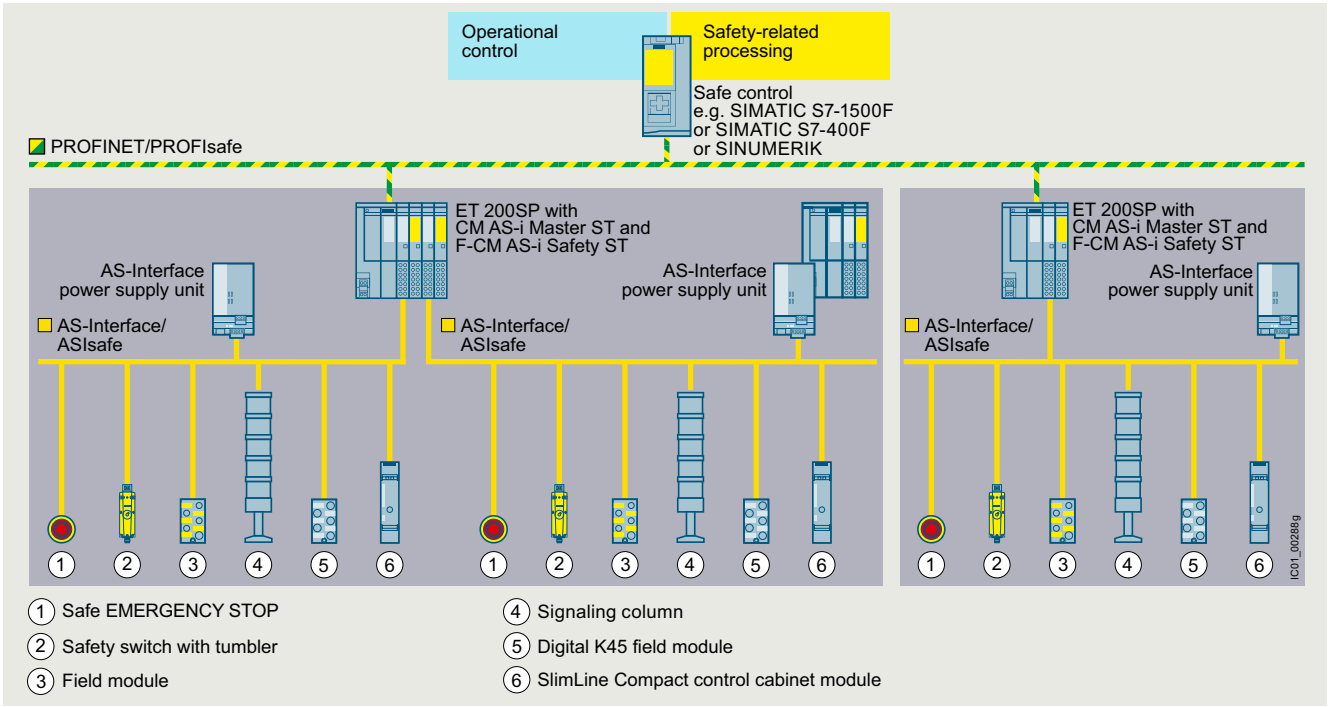
The safety application is programmed in the SIMATIC S7 F-CPU with Distributed Safety, S7 F/FH Systems or Safety Advanced. The fail-safe input signals of the ASIsafe input modules are read via the AS-i bus line and are combined with any chosen further signals in the fail-safe program.

The fail-safe F-CM AS-i Safety ST module can be configured independently of the AS-i master. In this way, the F-CM AS-i Safety ST module can be connected to any AS-i network as required to evaluate the Safety data of the safe AS-i input modules and forward them to the F-CPU. In this case, the fail-safe module is plugged into a light BaseUnit of type C0.

The fail-safe output signals can be output via safe SIMATIC output modules or also via safe AS-i output modules. No special functions are required for this in the program.

Together with an ET 200SP station with ET 200SP F-CPU 1510SP F, 1512SP F, 1514SP F or 1515SP PC F, pre-processing of safe AS-i signals directly in the ET 200SP station is possible, as well as the configuration of an autonomous AS-i Safety station without a higher-level CPU.

Configuration examples of AS-Interface networks with CM AS-i Master ST and F-CM AS-i Safety ST for SIMATIC ET 200SP



AS-Interface configuration comprising an ET 200SP station with CM AS-i Master ST and F-CM AS-i Safety ST modules

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Selection and ordering data

Ordering data	Article No.
F-CM AS-i Safety ST communications module • Fail-safe module for SIMATIC ET 200SP, can be plugged onto BaseUnit type C1 (alternatively type C0) • Operation requires an AS-i master, e.g. CM AS-i Master ST • Can be used up to SIL 3 (IEC 62061)/PL e (ISO 13849-1) • Coding element type H (included in scope of supply) • Dimensions W x H x D (mm): 20 x 73 x 58	**3RK7136-6SC00-0BC1**
Accessories	
BaseUnit BU20-P6+A2+4B • BaseUnit (dark), BU type C1 • Suitable for the fail-safe F-CM AS-i Safety ST module • Continuation of an AS-i network, connection with the AS-i voltage of the left-hand module • With spring-loaded terminals	**6ES7193-6BP20-0BC1**
Coding elements type H (spare part) • For the ET 200SP modules F-CM AS-i Safety ST and CM 4xIO-Link • With spring-loaded terminals • Packing unit 5 items	**6ES7193-6EH00-1AA0**
More accessories, see CM AS-i Master ST communications modules	

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Overview



ET200SP_Ex_IO_withPM

The intrinsically safe ET 200SP HA Ex I/O modules extend the SIMATIC ET 200SP HA and SIMATIC ET 200SP distributed I/O systems with the option of integrating devices located in hazardous areas (intrinsically safe sensors, actuators and HART field devices) into the system.

The ET 200SP HA Ex I/O modules with device protection according to intrinsic safety "i" offer channel outputs in Zone 0 or 1. 2-channel HART analog input and output modules and 2/4-channel digital input and output modules with different characteristic curves as well as a power module for intrinsically safe power supply of the modules.

Separate Ex isolators with correspondingly complex wiring and high space requirements are no longer required. The I/O modules can be installed up to ATEX Zone 2 and offer intrinsically safe circuits in Ex ia design for field devices up to Zone 0.

The Ex modules offer channel diagnostics and Configuration in Run and are approved for ambient temperatures from -40 to +70 °C.

Selection and ordering data

SIMATIC ET 200SP HA Ex digital modules	
Digital Ex-i input module, Ex-DI 4xNAMUR Suitable for BaseUnit type X1, channel diagnostics	**6DL1131-6TD00-0HX1**
Digital Ex-i output module, Ex-DQ 2x23,1VDC/20 mA Suitable for BaseUnit type X1, channel diagnostics	**6DL1132-6EB00-0HX1**
Digital Ex-i output module, Ex-DQ 2x17,4VDC/27 mA Suitable for BaseUnit type X1, channel diagnostics	**6DL1132-6CB00-0HX1**
SIMATIC ET 200SP HA Ex analog modules	
Analog Ex-i HART input module, Ex-AI 2xI 2-wire HART Suitable for BaseUnit type X1, channel diagnostics, 16 bits, +/-0.3%	**6DL1134-6TB00-0HX1**
Analog Ex-i input module, Ex-AI 4xTC/2xRTD 2-/3-/4-wire Suitable for BaseUnit type X1, channel diagnostics, 16 bits, +/-0.05%	**6DL1134-6JD00-0HX1**
Analog Ex-i HART output module, Ex-AQ 2xI HART HF Suitable for BaseUnit type X1, channel diagnostics, 16 bits, +/-0.3%	**6DL1135-6TB00-0HX1**
Power module and BaseUnits	
Power module Ex-PM E 24 V 0.8 A, W x H: 50 mm x 117 mm, suitable for BaseUnit type W0	**6DL1133-6PX00-0HW0**
BU type X1 for I/O modules Push-in terminals, W x H: 20 mm x 117 m	**6DL1193-6BP00-0BX1**
BU type W0 for Ex power module PM-E W x H: 50 mm x 117 mm	**6DL1193-6BP00-0DW0**

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Technical specifications

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
General information		
Product type designation	Ex-AI 2xI 2-wire HART	Ex-AI 4xTC/2xRTD 2-/3-/4-wire
Product function		
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V16	V16
• STEP 7 configurable/integrated from version	V5.6 SP2	V5.6 SP2
• PCS 7 configurable/integrated from version	V9.1	V9.1
• PCS neo can be configured/integrated from version	V3.1	V3.1
• PROFINET from GSD version/GSD revision	GSDML V2.35	GSDML V2.35
Operating mode		
• MSI	Yes	Yes
Analog inputs		
Number of analog inputs	2; Differential inputs	
• For current measurement	2	
• For voltage measurement		4
• For resistance/resistance thermometer measurement		2
• For thermocouple measurement		4
Constant measurement current for resistance-type transmitter, typ.		0.5 mA
Cycle time (all channels), min.	3 ms	
Technical unit for temperature measurement adjustable		Yes; °C/°F/K
Input ranges (rated values), voltages		
• -1 V to +1 V		Yes; 16 bit incl. sign
• -250 mV to +250 mV		Yes; 16 bit incl. sign
• -50 mV to +50 mV		Yes; 16 bit incl. sign
• -80 mV to +80 mV		Yes; 16 bit incl. sign
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes; 15 bit + sign	
Input ranges (rated values), thermocouples		
• type B		Yes; 16 bit incl. sign
• type C		Yes; 16 bit incl. sign
• Type E		Yes; 16 bit incl. sign
• Type J		Yes; 16 bit incl. sign
• Type K		Yes; 16 bit incl. sign
• Type L		Yes; 16 bit incl. sign
• Type N		Yes; 16 bit incl. sign
• Type R		Yes; 16 bit incl. sign
• Type S		Yes; 16 bit incl. sign
• Type T		Yes; 16 bit incl. sign
• Type U		Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST		Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer		
• Cu 10		Yes; 16 bit incl. sign
• Ni 100		Yes; 16 bit incl. sign
• LG-Ni 1000		Yes; 16 bit incl. sign
• Ni 120		Yes; 16 bit incl. sign
• Ni 200		Yes; 16 bit incl. sign
• Ni 500		Yes; 16 bit incl. sign
• Pt 100		Yes; 16 bit incl. sign
• Pt 1000		Yes; 16 bit incl. sign
• Pt 200		Yes; 16 bit incl. sign
• Pt 500		Yes; 16 bit incl. sign

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Technical specifications (continued)

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
Input ranges (rated values), resistors		
• 0 to 150 ohms		Yes; 15 bit
• 0 to 300 ohms		Yes; 15 bit
• 0 to 600 ohms		Yes; 15 bit
• 0 to 3000 ohms		Yes; 15 bit
• 0 to 6000 ohms		Yes; 15 bit
• PTC		Yes; 15 bit
Thermocouple (TC)		
- Temperature compensation		
- Parameterizable		Yes
Cable length		
• shielded, max.	500 m; Ex characteristic values must be observed	200 m; Ex characteristic values must be observed; line resistance at RTD (simple) max. 25 ohm; loop resistance at TC max. 8 kOhm
• unshielded, max.	300 m; Ex characteristic values must be observed	
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes; channel by channel	Yes; Channel-by-channel, results from the selected interference frequency suppression
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 Hz	16.6 / 50 / 60 Hz, channel-by-channel
• Conversion time (per channel)		180 / 60 / 50 ms, results from the selected interference frequency suppression
Smoothing of measured values		
• Number of smoothing levels	4; None; 4/8/16 times	
• Parameterizable	Yes	Yes; none, weak, medium, strong, channel-by-channel
Encoder		
Connection of signal encoders		
• for current measurement as 2-wire transducer	Yes	
- Burden of 2-wire transmitter, max.	750 Ω; At 20 mA input current	
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)		0.05 %
• Current, relative to input range, (+/-)	0.2 %	
• Resistance, relative to input range, (+/-)		0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB	70 dB
• Common mode voltage, max.		60 V; Applicable for use in non-hazardous areas; no common mode voltage permissible in hazardous areas
• Common mode interference, min.		90 dB
Protocols		
HART protocol	Yes	
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	Yes	Yes; two upper and two lower limit values in each case
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes; channel by channel	Yes; channel by channel

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Technical specifications (continued)

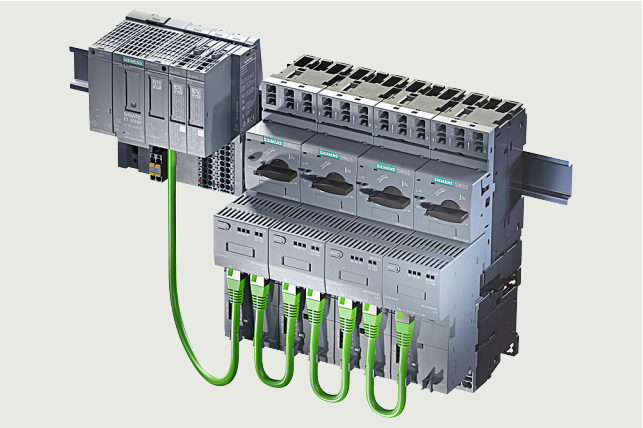
Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
• Short-circuit	Yes; channel by channel	
• Group error	Yes	
• Overflow/Underflow	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Ex(i) characteristics		
maximum values for connecting terminals for gas group IIC		
• Uo (no-load voltage), max.	26 V	5.9 V
• Io (short-circuit current), max.	93 mA	18 mA
• Po (power output), max.	605 mW	27 mW
• Co (permissible external capacity), max.	99 nF	43 µF
• Lo (permissible external inductivity), max.	4 mH	110 mH
• Ui (intrinsically safe input voltage), max.	10 V	
• Um (voltage at non-intrinsically safe connecting terminals), max.	60 V	60 V
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	55 g	55 g

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Overview



SIRIUS 3RA8 intelligent load feeder



Part of the SIMATIC ET 200SP automation system

More information

Homepage, **see** www.siemens.com/sirius

SiePortal, **see** www.siemens.com/product_catalog_siep?3RA8

Catalog IC 10, **see** www.siemens.com/ic10

Further components in the ET 200SP I/O system:
- SiePortal, see SIMATIC ET 200SP
- Homepage, see www.siemens.com/et200sp

The 3RA8 intelligent load feeders consist of 3RV23 motor starter protectors and 3RT2 electromechanical contactors.

The 3RA8 intelligent load feeders are connected to the SIMATIC ET 200SP via the flexible station extension (ET connection) using the BA-Send BusAdapter.

Configuration, parameterization, and diagnostics of the feeder can be performed directly in STEP 7 (TIA Portal). The BA-Send BusAdapter supports up to 16 intelligent load feeders.

12 preassembled 3RA8 combinations can be ordered for direct-on-line and reversing starting of standard three-phase motors up to 32 A.

The feeders are equipped with either the Standard or the High Feature version of the 3RC7 intelligent link module, see also the function overview of the 3RC7 intelligent link modules.

In the 3RA8 intelligent load feeder, the 3RV23 motor starter protector provides short-circuit protection. Overload protection is provided by the 3RC7 intelligent link module. The intelligent load feeders are available with setting ranges from 0.4 to 32 A in sizes S00 and S0.

The table below lists the maximum power of the three-phase motor for pre-assembled 3RA8 intelligent load feeders based on the type of coordination at a voltage of 400 V AC:

Size	Type of coordination	Type	Adjustable current response value of the inverse-time delayed overload release	Power of three-phase motor
			A	kW
S00	2	3RA8.12-1EE.0	0.4 ... 4 A	0.12 - 1.5 kW
	1	3RA8.11-1KE.0	1.2 ... 12 A	0.55 - 5.5 kW
S0	2	3RA8.22-4EE.0	3.5 ... 32 A	1.5 ... 15 kW

Operating conditions

The 3RA8 intelligent load feeders are climate-proof. They are intended for use in enclosed rooms in which no harsh operating conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable covers must be provided for installation in dusty and damp locations.

Behavior in the event of short circuit

EN 60947-4-1 (VDE 0660 Part 102) and IEC 60947-4-1 make a distinction between two different types of coordination, which are referred to as type of coordination 1 and type of coordination 2. Any short circuits that occur are cleared safely by both types of coordination. The only differences concern the extent of the damage caused to the device by a short circuit.

Type of coordination 1

The load feeder may be non-operational after a short-circuit trip. Damage to the contactor or to the overload release is permissible.

Type of coordination 2

There must be no damage to the overload release or to any other components after a short-circuit trip. The load feeder can resume operation without needing to be renewed. At most, welding of the contactor contacts is permissible if they can be disconnected easily without any significant deformation.

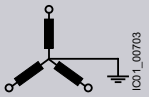
Voltage data

The data for 3-phase systems according to IEC 60947-4-1 are valid for the following line system configurations:

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Overview (continued)

Voltage U_e	Line system configuration Three-phase four-wire systems
V	V
230	--
400	230/400
440	260/440
500	--
690	400/690



-- Not specified

Tripping times

In the 3RA8 intelligent load feeder, thermal motor protection is ensured by the 3RC7 intelligent link module. The trip class (Class 10E or 20E) can be configured via STEP 7 (TIA Portal).

Connection methods

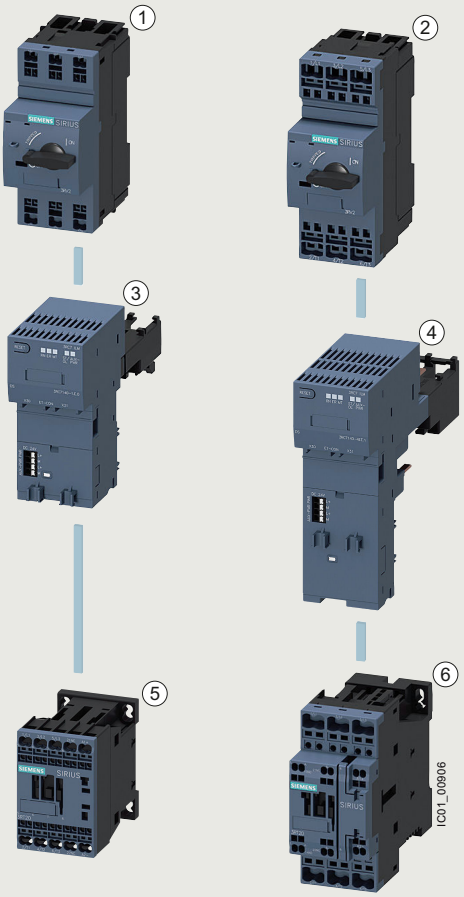
The 3RA8 intelligent load feeders are all provided with spring-loaded terminals.

Mounting

The 3RA8 intelligent load feeders are suitable for the following types of mounting:

- For mounting on DIN rail TH 35-15 according to IEC 60715
- For mounting on busbar adapters (busbar center-to-center spacing 60 mm, busbar thickness 5 to 10 mm with beveled edges), see 3RA2 load feeders → Accessories
- For screw fixing with 3RV2928-0B push-in lug, see 3RA2 load feeders → Accessories
- For installation with the 3RV29 infeed system, see 3RA2 load feeders and 3RV29 infeed system.

Direct-on-line starter • Sizes S00 and S0



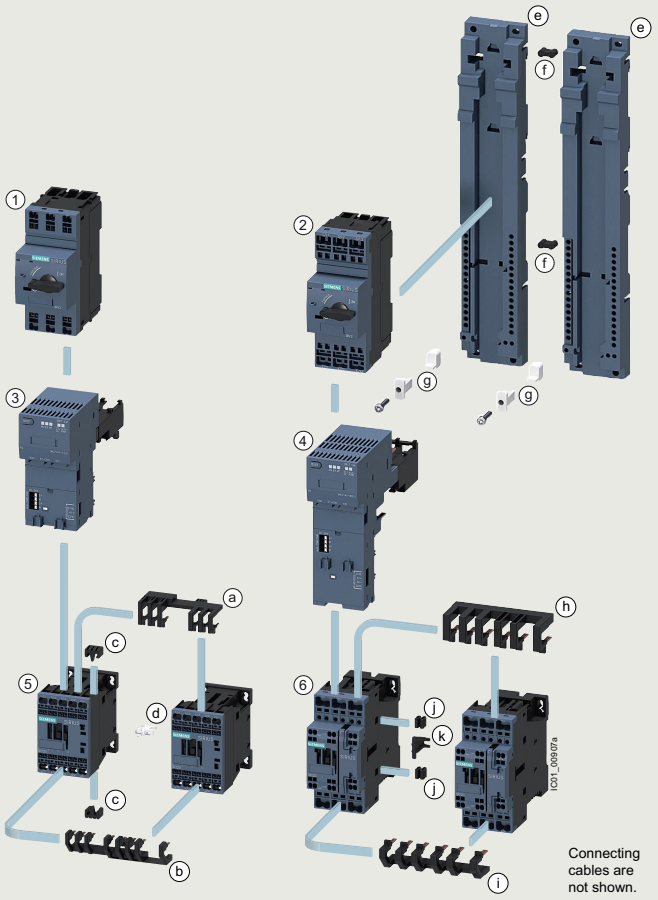
1. **Circuit breaker**
   Size S00
   Spring-loaded terminals
2. **Circuit breaker**
   Size S0
   Spring-loaded terminals
3. **Intelligent link module**
   Direct-on-line starter
   Size S00
   Spring-loaded terminals
   3RC7140-1EE00: 0.4 … 4 A, Standard
   3RC7140-1EE10: 0.4 … 4 A, High Feature
   3RC7140-1KE00: 1.2 … 12 A, Standard
   3RC7140-1KE10: 1.2 … 12 A, High Feature
4. **Intelligent link module**
   Direct-on-line starter
   Size S0
   Spring-loaded terminals
   3RC7140-4EE01: 3.5 … 32 A, Standard
   3RC7140-4EE11: 3.5 … 32 A, High Feature
5. **Contactor**
   Size S00
   Spring-loaded terminals
6. **Contactor**
   Size S0
   Spring-loaded terminals

Left: 3RA8 intelligent load feeder for direct-on-line starting with spring-loaded terminals, size S00
Right: 3RA8 intelligent load feeder for direct-on-line starting with spring-loaded terminals, size S0

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Overview (continued)

Reversing starter • Sizes S00 and S0



1 **Circuit breaker**
Size S00
Spring-loaded terminals

2 **Circuit breaker**
Size S0
Spring-loaded terminals

3 **Intelligent link module**
Reversing starter
Size S00
Spring-loaded terminals
3RC7141-1EE00: 0.4 ... 4 A, Standard
3RC7141-1EE10: 0.4 ... 4 A, High Feature
3RC7141-1KE00: 1.2 ... 12 A, Standard
3RC7141-1KE10: 1.2 ... 12 A, High Feature

4 **Intelligent link module**
Reversing starter
Size S0
Spring-loaded terminals
3RC7141-4EE01: 3.5 ... 32 A, Standard
3RC7141-4EE11: 3.5 ... 32 A, High Feature

5 **Contactor**
Size S00
Spring-loaded terminals

6 **Contactor**
Size S0
Spring-loaded terminals

Wiring kit
3RA2913-2LA2
Reversing starter
a Upper wiring module
b Lower wiring module
c Two connecting clips for two contactors
d Mechanical interlock

Wiring kit
3RA2923-2LB2
Reversing starter
e Two DIN-rail adapters
f Two link wedges
g Two connecting pieces and two screw holders
h Upper wiring module
i Lower wiring module
j Two connecting clips for two contactors
k Mechanical interlock

Left: 3RA8 intelligent load feeder for reversing starting in size S00
Right: 3RA8 intelligent load feeder for reversing starting and DIN-rail mounting in size S0

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Overview (continued)

Article number scheme

Product versions		Article number									
SIRIUS intelligent load feeders		**3RA8**	❒	❒	❒	–	❒	❒	❒	❒	**0**
Product function	Direct-on-line starters		**4**								
	Reversing starters		**5**								
Size	S00			**1**							
	S0			**2**							
Type of coordination	1				**1**						
	2				**2**						
Current range	0.4 ... 4 A						**1**	**E**			
	1.2 ... 12 A						**1**	**K**			
	3.5 ... 32 A						**4**	**E**			
Connection methods	Spring-loaded terminals								**E**		
Version	Standard									**0**	
	High Feature									**1**	
Example		**3RA8**	**4**	**1**	**2**	**–**	**1**	**E**	**E**	**0**	**0**

Note:
The article number scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

Part of the SIMATIC automation system

- One engineering tool for the entire automation system
- Configuration and parameterization in STEP 7 (TIA Portal)
- Easy reading of status and current values
- Error and maintenance demands with stored plain text messages through integrated system diagnostics in the SIMATIC environment

Transparency down to the field level

- Measurement of current, voltage, and power (including power factor)
- Load diagnostics (1 or 3-phase)

Proactive protection

- Extended wide setting range of the overload protection function
- Preventive maintenance by detecting faults and discrepancies

Minimal effort

- Reduced wiring costs
- Standardized design due to fewer versions
- Extensive accessories

Lead text for selection and ordering data (paper)

Individual components of the 3RA8 intelligent load feeders, see SIRIUS 3RC7 intelligent link modules:

- Building intelligent load feeders from individual components → Overview
- Accessories

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Selection and ordering data

	size of load feeder	adjustable current response value current of the current-dependent overload release A	type of coordination	Article No.
Intelligent load feeder, with spring-loaded terminals				
Standard direct starter				
3RA8412-1EE00	S00	0.4 ... 4	2	3RA8412-1EE00
		1.2 ... 12	1	3RA8411-1KE00
	S0	3.5 ... 32	2	3RA8422-4EE00
High Feature direct starter				
3RA8422-4EE10	S00	0.4 ... 4	2	3RA8412-1EE10
		1.2 ... 12	1	3RA8411-1KE10
	S0	3.5 ... 32	2	3RA8422-4EE10
reversing starter standard				
3RA8512-1EE00	S00	0.4 ... 4	2	3RA8512-1EE00
		1.2 ... 12	1	3RA8511-1KE00
	S0	3.5 ... 32	2	3RA8522-4EE00
reversing starter high feature				
3RA8522-4EE10	S00	0.4 ... 4	2	3RA8512-1EE10
		1.2 ... 12	1	3RA8511-1KE10
	S0	3.5 ... 32	2	3RA8522-4EE10

Technical specifications

More information
SiePortal, **see** www.siemens.com/product_catalog_siep?3RA8
Equipment Manual, **see** https://support.industry.siemens.com/cs/ww/en/view/109823514

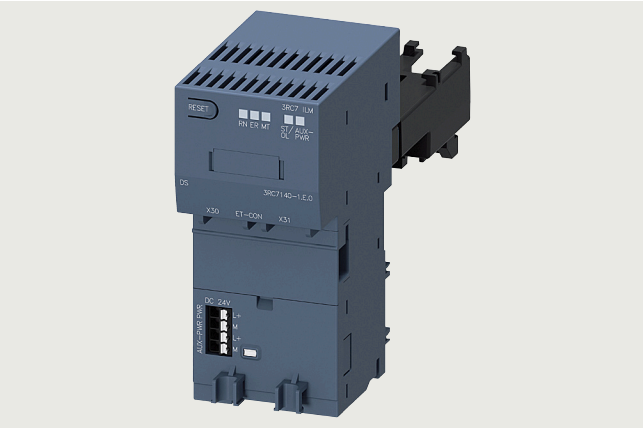
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Technical specifications

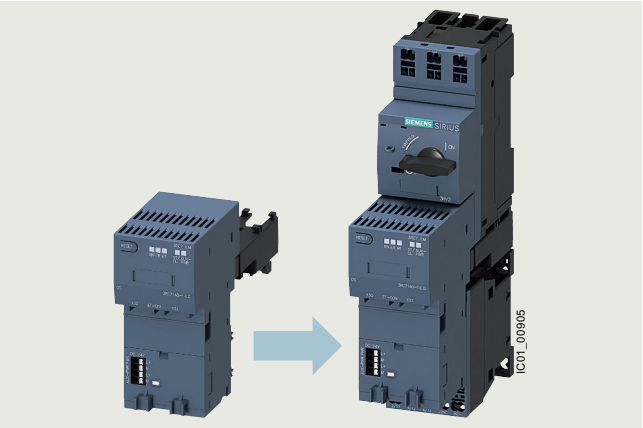
Article number		3RA8412-1EE.0	3RA8512-1EE.0	3RA8411-1KE.0	3RA8511-1KE.0	3RA8422-4EE.0	3RA8522-4EE.0
General technical data							
width × height × depth	mm	45 × 198 × 131	90 × 204 × 131	45 × 198 × 131	90 × 204 × 131	45 × 243 × 150	90 × 269 × 174
installation altitude at height above sea level maximum	m	2 000					
ambient temperature							
• during operation	°C	-20 ... +60					
• during storage	°C	-40 ... +80					
• during transport	°C	-40 ... +80					
vibration resistance		5 ... 8,4 Hz, 3,5 mm; 8,4 ... 150 Hz, 1 g; 10 cycles / 10 ... 60 Hz, 0,35 mm; 60 ... 500 Hz, 5 g; 10 cycles					
shock resistance according to IEC 60068-2-27		6 g / 11 ms (3 shocks); 10 g / 6 ms (1000 shocks)					
protection class IP on the front		IP20					
touch protection on the front according to IEC 60529		finger-safe					
Electrical data							
adjustable current response value current of the current-dependent overload release	A	0.4 ... 4		1.2 ... 12		3.5 ... 32	
operating voltage at AC-3 rated value maximum	V	690					
operating frequency	Hz	50 ... 60					
surge voltage resistance	kV	6					
conditional short-circuit current (Iq) at 400 V according to IEC 60947-4-1	A	150 000					
power loss [W] for rated value of the current at AC in hot operating state per pole	W	2.6		3.6		6.7	
trip class		CLASS 10E / CLASS 20E					
type of coordination		2		1		2	
Conductor cross-sections							
type of electrical connection for main current circuit		spring-loaded terminals					
type of connectable conductor cross-sections for main contacts							
• solid		2x (0.5 ... 4 mm²)				2x (1 ... 10 mm²)	
• stranded		2x (0.5 ... 4 mm²)				2x (1 ... 10 mm²)	
• finely stranded with core end processing		2x (0.5 ... 2.5 mm²)				2x (1 ... 6 mm²)	
• for AWG cables		2x 20 ... 12				2x 18 ... 8	
type of electrical connection for supply voltage line-side		spring-loaded terminals (push-in)					
type of connectable conductor cross-sections at the inputs for supply voltage							
• solid		0.2 ... 1.5 mm²					
• finely stranded without core end processing		0.2 ... 1.5 mm²					
• finely stranded with core end processing		0.2 ... 1 mm²					
• for AWG cables solid		24 ... 16					

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Overview



SIRIUS 3RC7 intelligent link module



SIRIUS 3RC7 intelligent link module combined with the 3RV2 motor starter protector/circuit breaker and 3RT2 contactor

More information

Homepage, **see** www.siemens.com/sirius

SiePortal, **see** www.siemens.com/product_catalog_siep?3RC7

Catalog IC 10, **see** www.siemens.com/ic10

Further components in the ET 200SP I/O system:
- SiePortal, see SIMATIC ET 200SP
- Homepage, see www.siemens.com/et200sp

The SIRIUS 3RC7 intelligent link module is the perfect connection between the Siemens SIRIUS and SIMATIC product families. The 3RC7 intelligent link module turns conventional load feeders into digital load feeders. The SIRIUS modular system becomes a communication-capable and configurable system with SIMATIC.



Video: SIRIUS modular system goes digital

Part of the SIRIUS modular system

The 3RC7 intelligent link module connects the 3RV2 motor starter protectors/circuit breakers and the 3RT2 contactors to form an intelligent load feeder. Intelligent load feeders can also be ordered as a 3RA8 complete unit, see SIRIUS 3RA8 intelligent load feeders.

Control, protection, and monitoring of all AC load types are possible up to a rated current of 32 A. 1- or 3-phase loads can be operated.

The 3RC7 intelligent link module is available for direct-on-line and reversing starters (Standard or High Feature):

- Size S00: Current ranges 0.4 to 4 A and 1.2 to 12 A
- Size S0: Current range 3.5 to 32 A

The intelligent link modules are offered with spring-loaded terminals and permit very fast mounting of the load feeders and a vibration-resistant design.

Mounting

Load feeders with 3RC7 intelligent link modules are suitable for the following types of mounting:

- For 1- or 2-row mounting on DIN rail TH 35-15 according to IEC 60715 (adapter for stand-alone installation, see 3RA2 load feeders → Accessories)
- For mounting on busbar adapters (busbar center-to-center spacing 60 mm, busbar thickness 5 to 10 mm with beveled edges), see 3RA2 load feeders → Accessories
- For screw fixing with 3RV2928-0B push-in lug, see 3RA2 load feeders → Accessories
- For installation with the 3RV29 infeed system, see 3RA2 load feeders and 3RV29 infeed system.

Overview of functions

The 3RC7 intelligent link module controls the 3RT2 contactor, following the commands of the controller. In the event of a fault, e.g. overload, undervoltage, or phase asymmetry, the intelligent link module switches off the 3RT2 contactor.

With the help of current and voltage measurement, detailed diagnostics of the load can be performed.

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Overview (continued)

Function	3RC7 ILM Standard	3RC7 ILM High Feature
Control (contact block)	✓	✓
Electronic motor overload protection	Class 10E/Class 20E[1)]	Class 10E/Class 20E[1)]
RESET	✓	✓
Current measurement and monitoring	✓	✓
Current phase asymmetry	✓	✓
Line voltage detection	✓	✓
Line voltage measurement and monitoring	--	✓
Supply voltage monitoring for electronics (PWR)	✓	✓
Supply voltage monitoring for contact block (AUX-PWR)	✓	✓
Starting time monitoring	✓	✓
Power measurement	--	✓
Energy measurement	--	✓
EMERGENCY START	✓	✓
Operating temperature measurement and monitoring	✓	✓
Group diagnostics	✓	✓
Cold start	✓	✓

✓ Available
-- Not available
1) Class 20E to 20 A.

The intelligent link module in the standard version detects the voltage at its input side.

The High Feature version can also be used to measure the phase voltage and the power (including power factor) of the connected load.

With the help of the 3RC7 intelligent link module, the operating hours of the load feeder as well as of the load can be recorded. Moreover, fault-induced shutdowns can be documented.

Part of the SIMATIC ET 200SP automation system

The 3RC7 intelligent link modules are connected to the SIMATIC ET 200SP via the flexible station extension (ET connection) using the BA-Send BusAdapter.

Configuration, parameterization, and diagnostics of the intelligent load feeder can be performed directly in STEP 7 (TIA Portal).



Video: Configuration and parameterization in STEP 7 (TIA Portal)

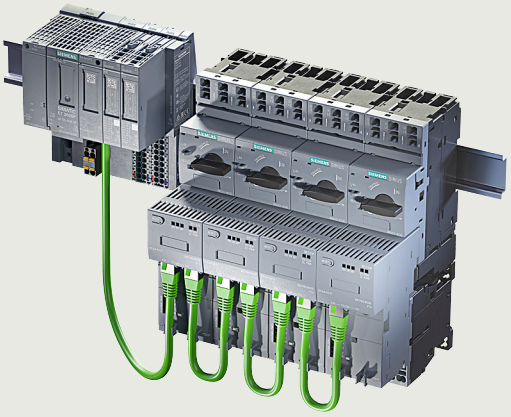
The ET 200SP BA-Send BusAdapter supports up to 16 intelligent load feeders. The distance between the BA-Send BusAdapter and the first 3RC7 intelligent link module can be up to 10 m.

Distances of up to two meters are possible between the individual intelligent load feeders.

The following devices are required for integration of the 3RC7 intelligent link module into the SIMATIC ET 200SP automation system:

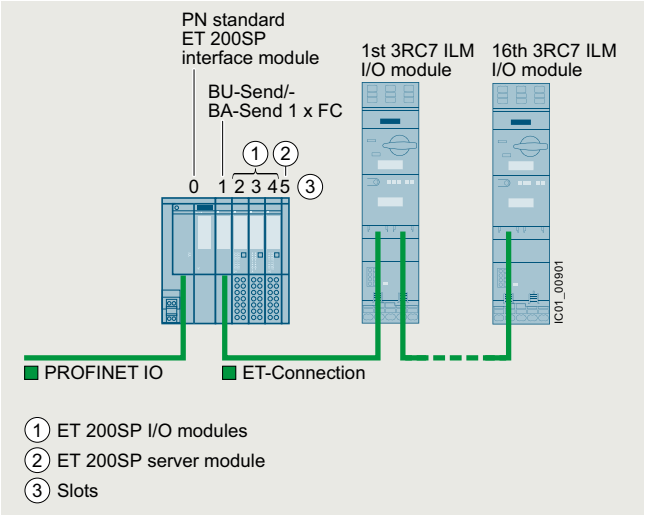
- SIMATIC ET 200SP interface modules and CPUs
- BA-Send BusAdapter (6ES7193-6AS00-0AA0)
- BU-Send BaseUnit (6ES7193-6BN00-0NE0)

For more information on SIMATIC ET 200SP, see www.siemens.com/et200sp.



Part of the SIMATIC ET 200SP automation system

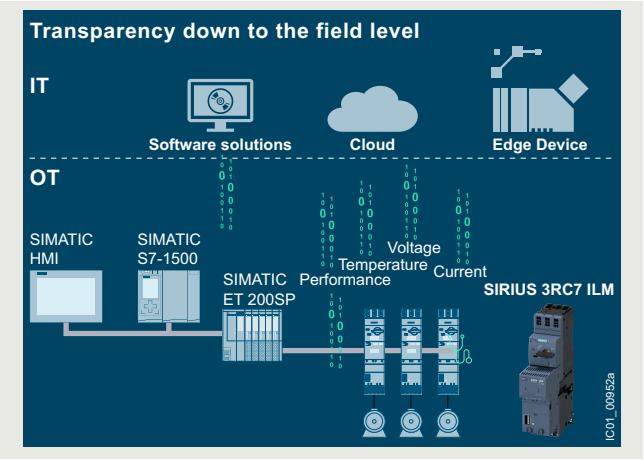
The 3RC7 intelligent link modules enable a high level of data transparency down to the field level and connect the operational technology (OT) with the overarching information technology (IT). By exchanging and using real-time data, operating processes can be optimized (condition monitoring, preventive maintenance) and the operational efficiency of the plant can be increased in a targeted manner.



System overview using the example of PROFINET IO

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Overview (continued)



Connectivity and transparency in the manufacturing environment

Building intelligent load feeders from individual components
Recommended combinations

Size	Type of coordination	Comprising the following individual components, which must be ordered separately Circuit breaker (without overload)	Contactor	3RC7 intelligent link module I_e in A		Mounting kit	Corresponds to the following 3RA8 load feeder
Intelligent load feeder for direct-on-line starting							
S00	2	3RV2311-1EC20	3RT2017-2BB42	0.4 ... 4	3RC714.-1EE.0[1]	--	3RA8412-1EE.0
	1	3RV2311-1KC20		1.2 ... 12	3RC714.-1KE.0[1]	--	3RA8411-1KE.0
S0	2	3RV2021-4EC20	3RT2027-2BB40	3.5 ... 32	3RC714.-4EE.1[1]	--	3RA8422-4EE.0
Intelligent load feeder for reversing starting							
S00	2	3RV2311-1EC20	3RT2017-2BB42 (2x)	0.4 ... 4	3RC714.-1EE.0[1]	3RA2913-2LA2	3RA8512-1EE.0
	1	3RV2311-1KC20		1.2 ... 12	3RC714.-1KE.0[1]		3RA8511-1KE.0
S0	2	3RV2021-4EC20	3RT2027-2BB40 (2x)	3.5 ... 32	3RC714.-4EE.1[1]	3RA2923-2LB2[2]/ 3RA2923-2MB2[3]	3RA8522-4EE.0

1) 3RC7 ILM can be used as a Standard or High Feature version.
2) To build an intelligent load feeder for reversing starting of size S0, the 3RA2923-2LB2 assembly kit must be used. The DIN-rail adapters included in the assembly kit are essential for DIN-rail mounting.
3) To build an intelligent load feeder for reversing starting of size S0 in the 3RV29 infeed system or on the 8US busbar adapter, the 3RA2923-2MB2 assembly kit must be used.

Note:
For graphic overviews of the recommended 3RA8 load feeders, see SIRIUS 3RA8 intelligent load feeders.

Possible combinations for 400 V AC, Class 10E

Size	Type of coordination	Conditional short-circuit current I_q in A	Rated current I_e in A	Comprising the following individual components, which must be ordered separately Circuit breaker (without overload)	Contactor	3RC7 link module I_e in A	
S00	2	150	0.5	3RV2311-0FC20	3RT2015-2BB42	0.4 ... 4	3RC714.-1EE.0
			0.63	3RV2311-0GC20			
			0.8	3RV2311-0HC20			
			1	3RV2311-0JC20			
			1.25	3RV2311-0KC20			
			1.6	3RV2311-1AC20			
			2	3RV2311-1BC20			
			2.5	3RV2311-1CC20			
			3.2	3RV2311-1DC20			
			4	3RV2311-1EC20			
			1.6	3RV2311-1AC20	3RT2015-2BB42	1.2 ... 12	3RC714.-1KE.0
			2	3RV2311-1BC20			
			2.5	3RV2311-1CC20			

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Overview (continued)

Size	Type of coordination	Conditional short-circuit current I_q in A	Rated current I_e in A	Comprising the following individual components, which must be ordered separately Circuit breaker (without overload)	Contactor	3RC7 link module I_e in A	
S00	2	150	3.2	3RV2311-1DC20	3RT2015-2BB42	1.2 ... 12	3RC714.-1KE.0
			4	3RV2311-1EC20			
	1	150	5	3RV2311-1FC20	3RT2015-2BB42	1.2 ... 12	3RC714.-1KE.0
			6.3	3RV2311-1GC20			
			8	3RV2311-1HC20			
			10	3RV2311-1JC20	3RT2016-2BB42		
			12.5	3RV2311-1KC20	3RT2017-2BB42		
S0	2	150	4	3RV2321-1EC20	3RT2024-2BB40	3.5 ... 32	3RC714.-4EE.1
			5	3RV2321-1FC20			
			6.3	3RV2321-1GC20			
			8	3RV2321-1HC20			
			10	3RV2321-1JC20			
			12.5	3RV2321-1KC20			
			16	3RV2321-4AC20	3RT2026-2BB40		
			20	3RV2321-4BC20	3RT2027-2BB40		
			22	3RV2321-4CC20			
			25	3RV2321-4DC20			
			28	3RV2321-4NC20			
			32	3RV2321-4EC20			

Note:
For possible combinations with ATEX approval, see Equipment Manual.

Article number scheme

Product versions		Article number									
SIRIUS intelligent link modules		**3RC7**	**1**	**4**	❒	-	❒	❒	❒	❒	❒
Communication	ET 200SP ET connection		**1**	**4**							
Product function	Direct-on-line starters				**0**						
	Reversing starters				**1**						
Current range	0.4 ... 4 A						**1**	**E**			
	1.2 ... 12 A						**1**	**K**			
	3.5 ... 32 A						**4**	**E**			
Connection methods	Spring-loaded terminals								**E**		
Version	Standard									**0**	
	High Feature									**1**	
Size	S00										**0**
	S0										**1**
Example		**3RC7**	**1**	**4**	**1**	-	**4**	**E**	**E**	**1**	**1**

Note:
The article number scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

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Benefits

Part of the SIMATIC automation system

- One engineering tool for the entire automation system
- Configuration and parameterization in STEP 7 (TIA Portal)
- Easy reading of status and current values
- Error and maintenance demands with stored plain text messages through integrated system diagnostics in the SIMATIC environment

Transparency down to the field level

- Measurement of current, voltage, and power (including power factor)
- Load diagnostics (1 or 3-phase)

Proactive protection

- Extended wide setting range of the overload protection function
- Preventive maintenance by detecting faults and discrepancies

Minimal effort

- Reduced wiring costs
- Standardized design due to fewer versions
- Extensive accessories

Lead text for selection and ordering data (paper)

For further accessories, see SIRIUS 3RA2 load feeders → Accessories

- 3RA29.2 DIN-rail adapter
- 3RV2928-0B push-in lugs for screw fixing
- 8US12 busbar adapter
- Miscellaneous accessories (connecting wedges, spacers, screwdrivers, device identification labels)

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Selection and ordering data

	size of contactor can be combined company-specific	adjustable current response value current of the current-dependent overload release A	Article No.
Intelligent link module, with spring-loaded terminals			
Standard direct starter			
3RC7140-1EE00	S00	0.4 ... 4	3RC7140-1EE00
		1.2 ... 12	3RC7140-1KE00
	S0	3.5 ... 32	3RC7140-4EE01
High Feature direct starter			
3RC7140-4EE11	S00	0.4 ... 4	3RC7140-1EE10
		1.2 ... 12	3RC7140-1KE10
	S0	3.5 ... 32	3RC7140-4EE11
reversing starter standard			
3RC7141-1EE00	S00	0.4 ... 4	3RC7141-1EE00
		1.2 ... 12	3RC7141-1KE00
	S0	3.5 ... 32	3RC7141-4EE01
reversing starter high feature			
3RC7141-4EE11	S00	0.4 ... 4	3RC7141-1EE10
		1.2 ... 12	3RC7141-1KE10
	S0	3.5 ... 32	3RC7141-4EE11

	design of the product	Article No.
Accessories		
Adapter for stand-alone installation, with spring-loaded terminals		
3RC7940-2TE00	for 3RC7 with contactor size S00	3RC7940-2TE00
3RC7940-2TE00	for 3RC7 with contactor size S0	3RC7940-2TE01
Communication Cable		
between ET 200SP BusAdapter and 3RC7 ILM		
3RC7940-0TE10	length 0.5 m	3RC7940-0TE10
	length 2 m	3RC7940-0TE20
	length 5 m	3RC7940-0TE30
	length 10 m	3RC7940-0TE40
between 3RC7 direct-on-line starter and 3RC7 direct-on-line or reversing starter		
3RC7940-0TE01	for side-by-side mounting	3RC7940-0TE01
between 3RC7 reversing starter and 3RC7 direct-on-line or reversing starter		
3RC7940-0TE02	for side-by-side mounting	3RC7940-0TE02
between 3RC7 ILM and 3RC7 ILM		
3RC7940-0TE03	length 0.75 m	3RC7940-0TE03
	length 1.5 m	3RC7940-0TE04
	length 2 m	3RC7940-0TE05
Power Cable		
between 3RC7 direct starter and 3RC7 direct or reversing starter		
3RC7940-1TE01	for side-by-side mounting	3RC7940-1TE01
between 3RC7 reversing starter and 3RC7 direct or reversing starter		
3RC7940-1TE02	for side-by-side mounting	3RC7940-1TE02

	design of the product	Article No.
Reversing starter mounting kit for 3RC7, with spring-loaded terminals		
3RA2913-2LA2	for DIN-rail mounting, mounting on 60 mm busbar system or 3RV29 infeed system	3RA2913-2LA2
RH reversing starter mounting kit for 3RC7, with spring-loaded terminals		
3RA2923-2LB2	for DIN-rail mounting	3RA2923-2LB2
RS reversing starter mounting kit for 3RC7, with spring-loaded terminals		

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Selection and ordering data (continued)

	design of the product	Article No.
3RA2923-2MB2	for mounting on 60 mm busbar system or 3RV29 infeed system	3RA2923-2MB2

Technical specifications

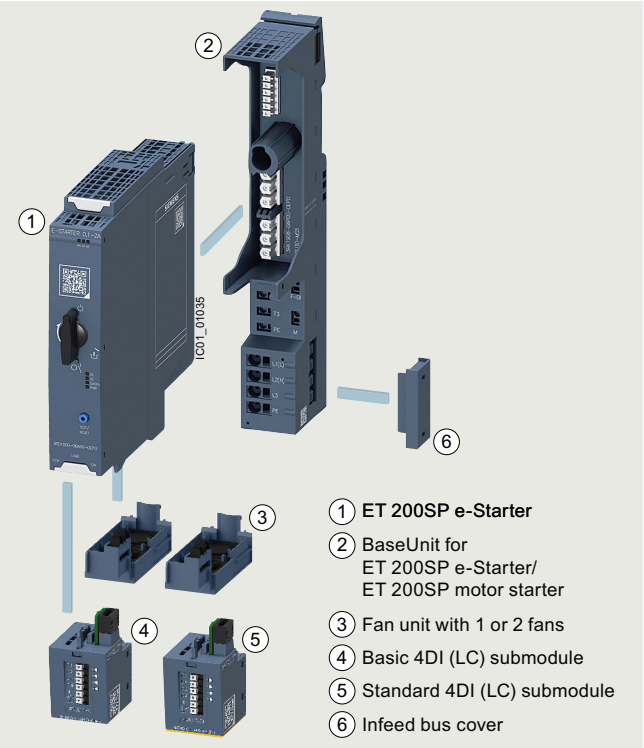
More information
SiePortal, **see** www.siemens.com/product_catalog_siep?3RC7
Equipment Manual, **see** https://support.industry.siemens.com/cs/ww/en/view/109823514

Technical specifications

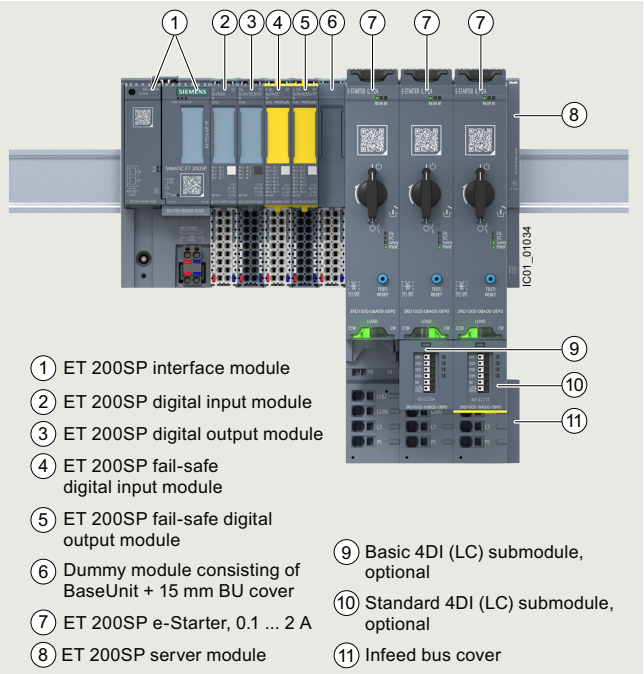
Article number		**3RC7140-1EE.0 3RC7141-1EE.0**	**3RC7140-1KE.0 3RC7141-1KE.0**	**3RC7140-4EE.1 3RC7141-4EE.1**
General data				
installation altitude at height above sea level maximum	m	2 000		
ambient temperature				
• during operation	°C	-20 ... +60		
• during storage	°C	-40 ... +80		
• during transport	°C	-40 ... +80		
vibration resistance		5 ... 8,4 Hz, 3,5 mm; 8,4 ... 150 Hz, 1 g; 10 cycles / 10 ... 60 Hz, 0,35 mm; 60 ... 500 Hz, 5 g; 10 cycles		
shock resistance according to IEC 60068-2-27		6 g / 11 ms (3 shocks); 10 g / 6 ms (1000 shocks)		
protection class IP		IP20		
touch protection on the front according to IEC 60529		finger-safe		
EMC immunity according to IEC 60947-1		environment A		
conducted interference due to burst according to IEC 61000-4-4		2 kV		
Main circuit				
adjustable current response value current of the current-dependent overload release	A	0.4 ... 4	1.2 ... 12	3.5 ... 32
operating voltage at AC-3 rated value maximum	V	690		
type of current for monitoring		AC		
operating frequency rated value	Hz	50 ... 60		
surge voltage resistance	kV	6		
trip class		CLASS 10E / CLASS 20E		
Auxiliary circuit				
supply voltage at DC	V	24		
auxiliary voltage at DC	V	24		
Connections				
type of electrical connection for supply voltage line-side		spring-loaded terminals (push-in)		
type of connectable conductor cross-sections at the inputs for supply voltage				
• solid		0.2 ... 1.5 mm²		
• finely stranded with core end processing		0.2 ... 1 mm²		
• for AWG cables solid		24 ... 16		

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Overview



ET 200SP e-Starter, BaseUnit, fan unit and 4DI (LC) submodules



ET 200SP e-Starter 3RD1000 in the ET 200SP I/O system

More information

Homepage, **see** www.siemens.com/sirius

SiePortal, **see** www.siemens.com/product_catalog_siep?3RD1000

TIA Selection Tool, **see** www.siemens.com/TST

Decision support for motor start – Starting and operating three-phase asynchronous motors efficiently, **see** www.siemens.com/motorstart-guide

Topic page, **see** https://support.industry.siemens.com/cs/ww/en/view/109977551

Equipment Manual, **see** https://support.industry.siemens.com/cs/ww/en/view/109972909

Catalog IC 10, **see** www.siemens.com/ic10

Further components in the ET 200SP I/O system:
- SiePortal, see SIMATIC ET 200SP
- Homepage, see www.siemens.com/et200sp

ET 200SP is a scalable and extremely flexible modular I/O system with degree of protection IP20.

As I/O modules, the ET 200SP e-Starters are an integral part of this I/O system. They are fully electronic switching and protection devices for 1-phase and 3-phase loads with fully electronic short-circuit protection, reversing functionality and optimized start properties.

SIMATIC ET 200SP e-Starter - Fully electronic switching and protecting

Basic functionality

All versions of the ET 200SP e-Starter feature the following functionality:

- Fully pre-wired e-Starter for switching and protecting any AC loads up to 3 kW from 48 to 480 V AC
- Fully electronic short-circuit protection up to 100 kA. The switch-off is less than 5 µs and can be reset.
- Self-assembling 32 A power bus, i.e. the load voltage is only fed in once for a group of ET 200SP e-Starters
- All supply voltages connected only once, i.e. when modules are added, they are automatically connected to the next module
- Hot swapping permissible
- Digital inputs can be used optionally via 4DI (LC) submodules.
- Control of the SIMATIC ET 200SP e-Starter from the control system and of the diagnostics status via the cyclic process image
- Diagnostics-capable for active monitoring of the switching and protection functions
- The signal states in the process image of the e-Starter provide information about protective devices (short circuit or overload), the switching states of the ET 200SP e-Starter and system faults.
- Smart Start function to avoid high starting current peaks and torque surges
- Phase-optimized connection to avoid inrush currents
- Upgradeable to include future functions

Fan unit

All ET 200SP e-Starters are supplied as standard with a fan unit equipped with a single fan. For applications subject to harsh ambient or load conditions, a fan unit with two fans can also be ordered as an optional accessory (see Accessories). For information on these boundary conditions, see Equipment Manual.

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Overview (continued)

Interference-proof setup of ET 200SP e-Starter

For interference-proof operation of the ET 200SP station in accordance with the IEC 60947-4-2 standard, use a dummy module upstream of the first ET 200SP e-Starter. The dummy module consists of the 6ES7193-6BP00-0BA0 or 6ES7193-6BP00-0DA0 BaseUnit and the 6ES7133-6CV15-1AM0 15 mm BU cover.

The 15 mm BU cover protects the plug contacts of the BaseUnit against dirt.

Electromechanical switching devices in series with ET 200SP e-Starters

Switching an inductive load - in particular of motors < 1 kW with high inductance - with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

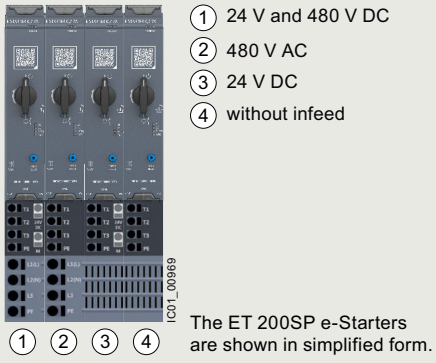
The resulting faults/damage can be prevented by first disconnecting with the ET 200SP e-Starter or by using EMC suppression modules:

- 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor (see Accessories for SIRIUS 3RT2 contactors and SIRIUS 3RH2 contactor relays → Miscellaneous)
- For motor suppression modules that are fitted in the main circuit, (see Motor suppression module)

Note:

For more information, see https://support.industry.siemens.com/cs/ww/en/view/109758696.

BaseUnits for ET 200SP e-Starter



View of the BaseUnit infeeds for the ET 200SP e-Starters

BaseUnits are components used for mounting the ET 200SP I/O modules.

The self-assembling voltage buses integrated into the BaseUnits reduce wiring outlay to the single infeed (both of auxiliary and load voltage).

All modules following on the right are automatically supplied upon plugging the BaseUnits together, if BaseUnits are inserted with a loop-through.

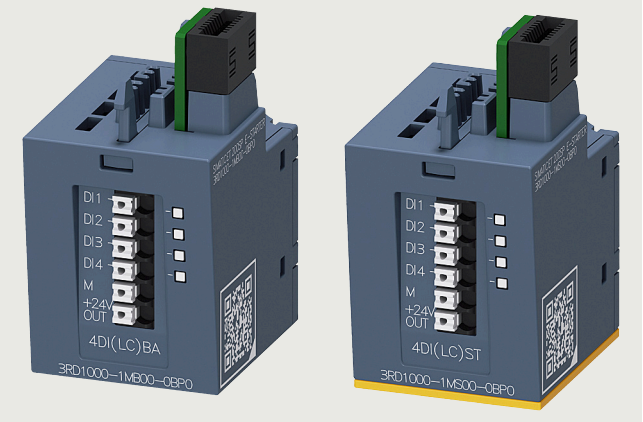
The rugged design and positively driven connection technology enable use in harsh industrial conditions.

Article number schemes

Product versions		Article number		
Motor starters		**3RD1000**	**– 0 B ❑ 0 0 – 0 E P 0**	
Current range	0.1 ... 2 A		**A**	Rated operational current 2 A
	0.7 ... 7 A		**B**	Rated operational current 7 A
Example		**3RD1000**	**– 0 B A 0 0 – 0 E P 0**	

The BaseUnits are available with various infeeds for the ET 200SP e-Starters.

Optional 4DI (LC) submodules



Optional 4DI (LC) submodules for the ET 200SP e-Starter

Each module is plugged into the front of the ET 200SP e-Starter, which supplies it with a 24 V DC operational voltage.

Basic 4DI (LC) submodule

This is an optional, digital input module with four inputs for local motor starter functions such as "manual local operation", "implementation of fast inputs" or "end position disconnection".

Standard 4DI (LC) submodule

This module offers additional features beyond those of the Basic 4DI (LC) submodule:

- Safety-related shutdown (STO) up to SIL 3/PL e Cat. 4
- ATEX/IECEx certification for the operation of motors in hazardous areas
- Advanced Condition Monitoring

Note:

For a list of all the functions provided by the 4DI (LC) submodules, see Equipment Manual.

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Overview (continued)

Product versions		Article number
BaseUnit		**3RK1908 – 0 A P 0 0 – 0 ❑ P 0**
BU infeed	24 V DC and 480 V AC	**A**
	24 V DC	**B**
	480 V AC	**C**
	Without infeed	**D**
Example		**3RK1908 – 0 A P 0 0 – 0 A P 0**

Note:
The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

The ET 200SP e-Starters offer a number of advantages:

- Fully integrated into the ET 200SP I/O system (including TIA Selection Tool and TIA Portal)
- Extremely fast, fully electronic and resettable short-circuit protection
- Phase-optimized switching on to reduce inrush currents
- Integrated reversing functionality
- Simple integrated transmission of measured values (current, voltage, power, etc.)
- Extensive parameterization by means of TIA Portal
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Long service life and low wear thanks to fully electronic switching
- Less space required in the control cabinet (20 to 80%) as a result of greater functional density
- Comprehensive diagnostics, information and limit value monitoring for preventive maintenance
- Optional, configurable inputs via 4DI (LC) submodules
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower overheads for stock-keeping and configuration as a result of reduced variance due to high functional density and wide setting range of the rated operational current
- Compatibility mode for direct replacement of the hybrid ET 200SP e-Starter without having to stop the CPU
- Smart Start function to prevent torque surges during the starting process of asynchronous motors

Standards and approvals

- IEC/EN 60947-4-2
- cULus 60947-4-2
- CCC approval for China

Application

The ET 200SP e-Starters are suitable for the following applications:

- Switching, protecting and monitoring of
  - 3-phase motors with overload and fully electronic short-circuit protection
  - 1-phase motors with overload and fully electronic short-circuit protection (e.g. 230 V motors for pump applications)
  - Ohmic loads with overload and short-circuit protection (e.g. for heaters)
- Plant monitoring and energy management in conveyor systems: Drive belt monitoring and blocking monitoring are possible by means of the phase asymmetry and zero current detection during current measurement, for example.
- Track switching and lifting table control in conveyor systems: Track switches can be implemented by means of the quick stop function and lifting table controls by means of the "immediate end position disconnection" function without any laborious programming.
- Safe isolation of the drive from main power supply: The isolating functions according to IEC 60947-1 offer protection against inadvertent activation during plant maintenance.

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Selection and ordering data

	adjustable current response value current of the current-dependent overload release A	Article No.
e-Starter reversing starter		
3RD1000-0BA00-0EP0	0.1 ... 2	3RD1000-0BA00-0EP0
3RD1000-0BB00-0EP0	0.7 ... 7	3RD1000-0BB00-0EP0

	design of the product	operating voltage of AC supply for motor starter V	for ET 200SP e-Starter V	supply voltage of DC supply V	Article No.
BaseUnit, with spring-loaded terminals (push-in) for e-starters and motor starters					
3RK1908-0AP00-0AP0	For AC/DC feed in	500	480	24	3RK1908-0AP00-0AP0
	For DC feed in	--	--	24	3RK1908-0AP00-0BP0
	For AC feed in	500	480	--	3RK1908-0AP00-0CP0
	Without feed in	--	--	--	3RK1908-0AP00-0DP0
for fail-safe e-Starters and motor starters					
3RK1908-0AP00-0EP0	with AC infeed, with F-DI	500	480	--	3RK1908-0AP00-0EP0
	without infeed, F-DI	--	--	--	3RK1908-0AP00-0FP0
	with AC infeed, with F-DI infeed	500	480	--	3RK1908-0AP00-0GP0
	with AC infeed, with F-DI loop-through	500	480	--	3RK1908-0AP00-0HP0
	without AC/DC infeed, with F-DI loop-through	--	--	--	3RK1908-0AP00-0JP0
	without AC/DC infeed, with F-DI infeed	--	--	--	3RK1908-0AP00-0KP0

	design of the product	supply voltage at DC rated value V	forward potential group from left	Article No.
BaseUnit, with spring-loaded terminals (push-in) for dummy modules				
6ES7193-6BP00-0BA0	BU15-P16+A0+2B, dark, looping through the potential group	24	Yes	6ES7193-6BP00-0BA0
	BU15-P16+A0+2D, light, opening a new potential group	24	No	6ES7193-6BP00-0DA0

	design of the product	product function on-site operation	digital inputs parameterizable	Article No.
4DI (LC) submodule, with spring-loaded terminals (push-in)				
3RD1000-1MB00-0BP0	Basic	Yes	Yes	3RD1000-1MB00-0BP0
3RD1000-1MS00-0BP0	Standard	Yes	Yes	3RD1000-1MS00-0BP0

	product designation	design of the product	Article No.
6ES7133-6CV15-1AM0	Base Unit cover 15 mm	15 mm	6ES7133-6CV15-1AM0
3RK1908-1CA00-0BP0	Base Unit cover 30 mm	for protection of empty slots, 30 mm	3RK1908-1CA00-0BP0
3RK1908-1DA00-2BP0	Infeed bus cover(scope of supply 10 units)	For ET 200SP	3RK1908-1DA00-2BP0
3RK1908-1EA00-1BP0	Mechanical bracket(scope of supply 5 units)	Mechanical, for ET 200SP	3RK1908-1EA00-1BP0
3RD1000-1FS00-0BP0	Ventilation unit	with 1 fan, for 3RD1000	3RD1000-1FS00-0BP0
3RD1000-1FD00-0BP0	Ventilation unit	with 2 fans, for 3RD1000	3RD1000-1FD00-0BP0
3RK1911-6EA00	Motor suppression module	Square	3RK1911-6EA00

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Selection and ordering data (continued)

	product designation	design of the product	Article No.
3RK1911-6EB00	Motor suppression module	Round	3RK1911-6EB00

Technical specifications

More information
SiePortal, **see** www.siemens.com/product_catalog_siep?3RD1000
Equipment Manual, **see** https://support.industry.siemens.com/cs/ww/en/view/109972909

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Technical specifications

Article number		3RD1000-0BA00-0EP0	3RD1000-0BB00-0EP0
product designation		e-Starter	
General technical data			
Width x Height x Depth	mm	30 × 151 × 167	
design of the switching contact		solid-state	
type of the motor protection		solid-state	
design of short-circuit protection		fully electronic	
installation altitude at height above sea level maximum	m	4 000; For derating see manual	
mounting position		vertical, horizontal	
fastening method		pluggable in BaseUnit	
ambient temperature			
• during operation	°C	-25 ... +60	
• during transport	°C	-40 ... +70	
• during storage	°C	-40 ... +70	
relative humidity during operation		10 ... 95	
wire length for motor unshielded maximum	m	200	
vibration resistance		f = 5 ... 8.5 Hz, dmax = 3.5 mm; 8.5 ... 26.9 Hz, amax = 10 m/s²/ f = 26.9 ... 60.1 Hz, dmax = 0.35 mm / f = 60.1 ... 500 Hz, amax = 50 m/s² / 10 cycles	
shock resistance		6 g / 11 ms (3 Schocks), 9 g / 6 ms (1000 Schocks)	
protection class IP		IP20	
type of coordination		2	
Electrical data			
supply voltage at DC rated value	V	24	
operating power at AC-53a at 400 V rated value	kW	0.75	3
operating voltage rated value	V	480	
operating frequency rated value	Hz	50 ... 60	
maximum short-circuit current breaking capacity (Icu)			
• at 400 V rated value	kA	100	
• at 500 V rated value	kA	100	
adjustable current response value current of the current-dependent overload release	A	0.1 ... 2	0.7 ... 7
ampacity when starting maximum	A	14.4	50.4
maximum permissible voltage for protective separation between main and auxiliary circuit	V	500	
insulation voltage rated value	V	500	
trip class		CLASS 10A / 10E / 20E	

Article number		3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0 3RK1908-0AP00-0EP0 3RK1908-0AP00-0GP0 3RK1908-0AP00-0HP0	3RK1908-0AP00-0DP0 3RK1908-0AP00-0FP0 3RK1908-0AP00-0JP0 3RK1908-0AP00-0KP0
product designation		BaseUnit			
General technical data					
Width x Height x Depth	mm	30 × 215 × 75			
ambient temperature					
• during operation	°C	-25 ... +60			
• during transport	°C	-40 ... +70			
• during storage	°C	-40 ... +70			
protection class IP on the front according to IEC 60529		IP20			
touch protection on the front according to IEC 60529		finger-safe			
Connections/ Terminals					
type of connectable conductor cross-sections					

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Technical specifications (continued)

Article number	3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0 3RK1908-0AP00-0EP0 3RK1908-0AP00-0GP0 3RK1908-0AP00-0HP0	3RK1908-0AP00-0DP0 3RK1908-0AP00-0FP0 3RK1908-0AP00-0JP0 3RK1908-0AP00-0KP0
at the inputs for supply voltage				
- solid	1x 0.5 ... 2.5 mm²		--	
- finely stranded with core end processing	1x 0.5 ... 2.5 mm²		--	
- finely stranded without core end processing	1x 0,5 ... 2,5 mm²		--	
- for AWG cables solid	1x 20 ... 12		--	
for supply				
- solid	1x 1 ... 6 mm²	--	1x 1 ... 6 mm²	--
- finely stranded with core end processing	1x 1 ... 6 mm²	--	1x 1 ... 6 mm²	--
- finely stranded without core end processing	1x 1 ... 6 mm²	--	1x 1 ... 6 mm²	--
- for AWG cables	1x 18 ... 10	--	1x 18 ... 10	--
for load-side outgoing feeder				
- solid	1x 0,5 ... 2,5 mm²			
- finely stranded with core end processing	1x 0,5 ... 2,5 mm²			
- finely stranded without core end processing	1x 0,5 ... 2,5 mm²			
- for AWG cables	1x 20 ... 12			
type of electrical connection for auxiliary and control circuit	spring-loaded terminals (push-in)			
Miscellaneous				
shape of the screwdriver tip	Slot			
size of the screwdriver tip	Standard screwdriver 0.6 mm x 3.5 mm			

Article number		3RD1000-1MB00-0BP0	3RD1000-1MS00-0BP0
product designation		4DI (LC) submodule	
design of the product		Basic	Standard
General technical data			
Width x Height x Depth	mm	30 × 54.5 × 42.3	
number of digital inputs		4	
installation altitude at height above sea level maximum	m	4 000	
mounting position		vertical, horizontal	
fastening method		can be plugged onto e-starters	
ambient temperature			
• during operation	°C	-25 ... +40	
• during transport	°C	-40 ... +70	
• during storage	°C	-40 ... +70	
Safety related data			
Safety Integrity Level (SIL) according to IEC 62061		--	SIL 3
performance level (PL) according to ISO 13849-1		--	PL e
category according to ISO 13849-1		--	4
product function Safe Torque Off (STO) via F-DI	No	Yes	
certificate of suitability IECEx	No	Yes	
certificate of suitability ATEX	No	Yes	

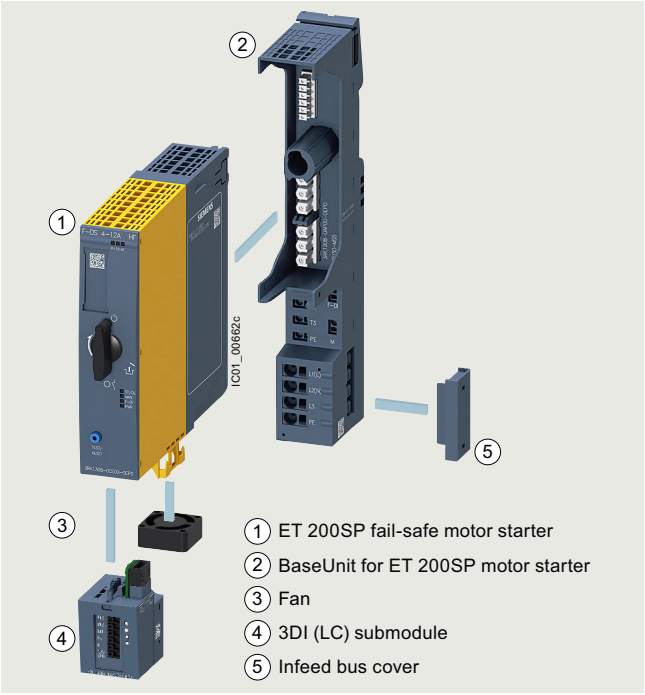
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Technical specifications (continued)

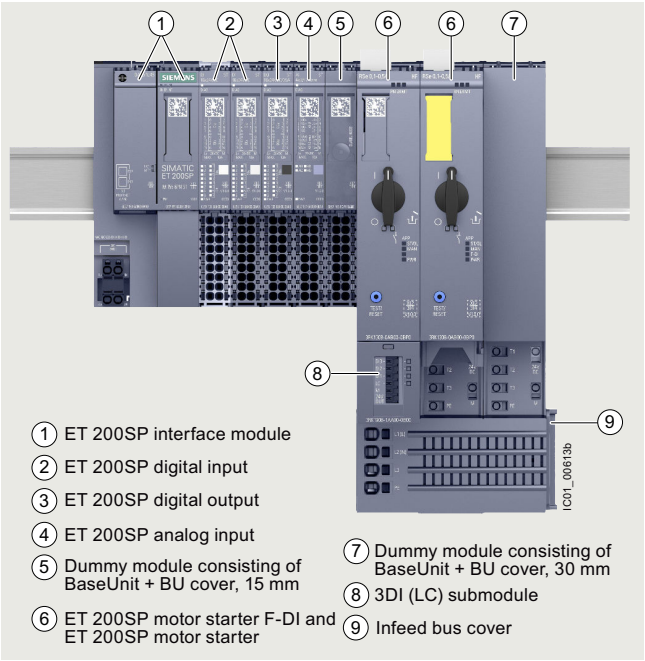
Article number		3RD1000-1MB00-0BP0	3RD1000-1MS00-0BP0
Connections/ Terminals			
connectable conductor cross-section for auxiliary contacts			
• solid or stranded	mm²	0.2 ... 1.5	
• finely stranded with core end processing	mm²	0.25 ... 1.5	
• finely stranded without core end processing	mm²	0.2 ... 1.5	
AWG number as coded connectable conductor cross section for auxiliary contacts		24 ... 16	
type of electrical connection for auxiliary and control circuit		spring-loaded terminals (push-in)	
Electrical data			
control supply voltage at DC rated value	V	20.4 ... 28.8	
Miscellaneous			
shape of the screwdriver tip		Slot	
size of the screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm	

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Overview



Motor starter, BaseUnit, fan and 3DI/LC submodule



3RK1308 motor starter in the ET 200SP I/O system

More information

Homepage, **see** www.siemens.com/sirius

SiePortal, **see** www.siemens.com/product_catalog_siep?3RK1308

TIA Selection Tool, **see** www.siemens.com/TST

Decision support for motor start - Starting and operating three-phase asynchronous motors efficiently, **see** www.siemens.com/motorstart-guide

Topic page with information on the planning and operating phase, **see** https://support.industry.siemens.com/cs/ww/en/view/109792664

Catalog IC 10, **see** www.siemens.com/ic10

Further components in the ET 200SP I/O system:
- SiePortal, see SIMATIC ET 200SP
- Homepage, see www.siemens.com/et200sp

ET 200SP is a scalable and extremely flexible modular I/O system with degree of protection IP20.

As I/O modules, the ET 200SP motor starters are an integral part of this I/O system. They are switching and protection devices for 1- and 3-phase loads and are available as direct-on-line or reversing starters.



Video: SIMATIC ET 200SP motor starter - Flexible, powerful, compact

Basic functionality

All versions of the ET 200SP motor starter feature the following functionality:

- Fully pre-wired motor starters for switching and protecting any three-phase loads up to 5.5 kW from 48 V AC to 500 V AC
- Disconnection possible via fail-safe motor starters up to SIL 3 and PL e Cat. 4
- Self-assembling 32 A power bus, i.e. the load voltage is only fed in once for a group of motor starters
- All supply voltages connected only once, i.e. when modules are added, they are automatically connected to the next module
- Hot swapping is permissible
- Digital inputs can optionally be used via a 3DI/LC submodule
- Control of the motor starter from the control system and of the diagnostics status via the cyclic process image
- Diagnostics-capable for active monitoring of the switching and protection functions
- The signal states in the process image of the motor starter provide information about protective devices (short circuit or overload), the switching states of the motor starter, and system faults.

Use of fan

For motor starters with a 12 A rated current, the 3RW4928-8VB00 fan is included in the scope of supply.

This fan can also be ordered as an option for motor starters with lower rated currents, if the boundary conditions demand this. For information on the ambient conditions for the use of motor starters, see Equipment Manual.

Designing interference-free motor starters

For interference-free operation of the ET 200SP station in accordance with IEC 60947-4-2 standard, use a dummy module before the first motor starter. The dummy module consists of the 6ES7193-6BP00-0BA0 or 6ES7193-6BP00-0DA0 BaseUnit and the 6ES7133-6CV15-1AM0 15 mm BU cover.

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Overview (continued)

The 15 mm BU cover protects the plug contacts of the BaseUnit against dirt.

Electromechanical switching devices in series with hybrid motor starters

Switching an inductive load - in particular of motors < 1 kW with high inductance - with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

The resulting faults/damage can be prevented by first disconnecting with the hybrid motor starter or by using EMC suppression modules:

- 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor (see Accessories for SIRIUS 3RT2 contactors and SIRIUS 3RH2 contactor relays → Miscellaneous)
- For motor suppression modules that are fitted in the main circuit, (see Motor suppression module)

Note:

For more information, see https://support.industry.siemens.com/cs/ww/en/view/109758696

3DI/LC submodule



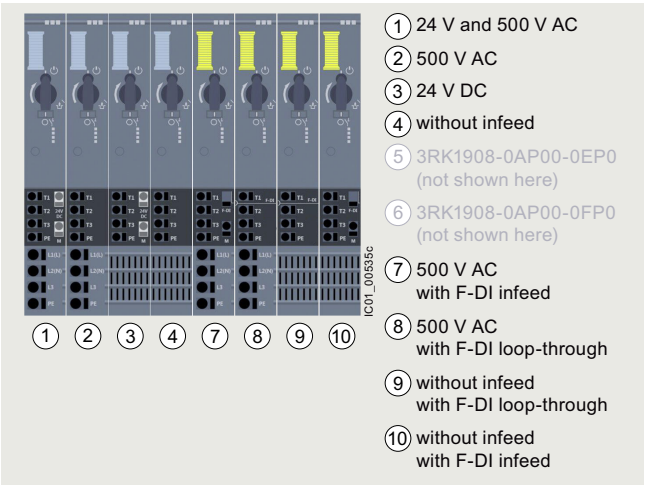
3DI/LC submodule

This is a digital input module with three inputs for local motor starter functions such as "manual local operation", "implementation of fast inputs" or "end position disconnection".

For a list of all the functions permitted by the 3DI/LC submodule, see Equipment Manual.

The module is plugged into the front of the motor starter from which it is supplied with an operational voltage of 24 V DC.

BaseUnits for motor starters



View of the BaseUnit infeeds for the motor starters

BaseUnits are components used for mounting the ET 200SP I/O modules.

The self-assembling voltage buses integrated into the BaseUnits reduce wiring outlay to the single infeed (both of auxiliary and load voltage).

All modules following on the right are automatically supplied upon plugging the BaseUnits together, if BaseUnits are inserted with a loop-through.

The rugged design and positively driven connection technology enable use in harsh industrial conditions.

The BaseUnits are available with various infeeds for the motor starters.

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Overview (continued)

Article number schemes

Product versions		Article number		
Motor starters		**3RK1308**	**– 0 ❑ ❑ 0 0 – 0 C P 0**	
Product function	Direct-on-line starters		**A**	For motor standard output 0.09 ... 5.5 kW[1]
	Reversing starters		**B**	For motor standard output 0.09 ... 5.5 kW[1]
	Fail-safe direct-on-line starters		**C**	For motor standard output 0.09 ... 5.5 kW[1]
	Fail-safe reversing starters		**D**	For motor standard output 0.09 ... 5.5 kW[1]
Current range	0.1 ... 0.4 A		**A**	Maximum current-carrying capacity when starting 4 A
	0.3 ... 1 A		**B**	Maximum current-carrying capacity when starting 10 A
	0.9 ... 3 A		**C**	Maximum current-carrying capacity when starting 30 A
	2.8 ... 9 A		**D**	Maximum current-carrying capacity when starting 90 A
	4 ... 12 A		**E**	Including fan (3RW4928-8VB00), Maximum current-carrying capacity when starting 100 A
Example		**3RK1308**	**– 0 A D 0 0 – 0 C P 0**	

[1] For standard motors: Three-phase asynchronous motors, 1-phase or 3-phase; 1-phase AC motors; 1-phase asynchronous motors, at 400 V AC and 500 V AC; the actual starting and rated data of the motor to be protected must be considered when selecting the units.

Product versions		Article number		
BaseUnit		**3RK1908**	**– 0 A P 0 0 – 0 ❑ P 0**	
BU infeed	24 V DC and 500 V AC		**A**	
	24 V DC		**B**	
	500 V AC		**C**	
	Without infeed		**D**	
	500 V AC		**G**	With F-DI infeed
	500 V AC		**H**	With F-DI loop-through
	Without infeed		**J**	With F-DI loop-through
	Without infeed		**K**	With F-DI infeed
Example		**3RK1908**	**– 0 A P 0 0 – 0 A P 0**	

Note:
The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

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Benefits

The ET 200SP motor starters offer a number of advantages:

- Fully integrated into the ET 200SP I/O system (including TIA Selection Tool and TIA Portal)
- High degree of flexibility when it comes to safety applications via SIMATIC F-CPU or 3SK safety relays up to SIL 3 and PL e Cat. 4
- Simple, integrated current value transmission
- Extensive parameterization by means of TIA Portal
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Greater endurance and reduced heat losses thanks to hybrid technology
- Less space required in the control cabinet (20 to 80%) thanks to high functional density (direct-on-line and reversing starters in same width)
- Extensive diagnostics and information for preventive maintenance
- Configurable inputs via 3DI (LC) submodule
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower overheads for stock-keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:3)
- Technology has lower intrinsic power losses than speed-controlled drive systems, so that less cooling (and smaller footprint) are possible

Standards and approvals

- IEC/EN 60947-4-2
- UL 60947-4-2
- CSA
- ATEX
- IEC 62061: SIL 3
- ISO 13849-1: PL e
- CCC approval for China

Application

The ET 200SP motor starters are suitable for the following applications:

- Switching and monitoring of
  - 3-phase motors with overload and short-circuit protection (e.g. 400 V asynchronous motors for secondary drives in conveyor systems)
  - 1-phase motors with overload and short-circuit protection (e.g. 230 V motors for pump applications)
  - Resistive loads by means of current value and diagnostics via the maintenance function (e.g. for heaters)
- Plant monitoring and energy management in conveyor systems: By means of the phase asymmetry and residual current detection during current measurement, drive belt monitoring and blocking monitoring are possible, for example.
- Track switching and lifting table control in conveyor systems: Track switches can be implemented by means of the quick stop function and lifting table controls by means of the "instantaneous end position disconnection" function without any laborious programming.
- Safe isolation of drive from main power supply: The isolating functions in accordance with IEC 60947-1 offer protection against inadvertent activation during plant maintenance.

Motor starters in the process industry

For the ET 200SP motor starters, special 3RK1908-0AP00-0.H0 BaseUnits are available that enable the devices to also be used in the ET 200SP HA I/O system. This is typically used in process engineering applications.

For more information, see https://mall.industry.siemens.com/mall/en/en/Catalog/Products/10398144?tree=CatalogTree.

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Selection and ordering data

	adjustable current response value current of the current-dependent overload release A	ampacity when starting maximum A	Article No.
Motor starter			
Direct-on-line starter			
3RK1308-0AB00-0CP0	0.1 ... 0.4	4	3RK1308-0AA00-0CP0
	0.3 ... 1	10	3RK1308-0AB00-0CP0
	0.9 ... 3	30	3RK1308-0AC00-0CP0
	2.8 ... 9	90	3RK1308-0AD00-0CP0
	4 ... 12	120	3RK1308-0AE00-0CP0
Reversing starter			
3RK1308-0BB00-0CP0	0.1 ... 0.4	4	3RK1308-0BA00-0CP0
	0.3 ... 1	10	3RK1308-0BB00-0CP0
	0.9 ... 3	30	3RK1308-0BC00-0CP0
	2.8 ... 9	90	3RK1308-0BD00-0CP0
	4 ... 12	120	3RK1308-0BE00-0CP0
Fail-safe direct-on-line starter			
3RK1308-0CE00-0CP0	0.1 ... 0.4	4	3RK1308-0CA00-0CP0
	0.3 ... 1	10	3RK1308-0CB00-0CP0
	0.9 ... 3	30	3RK1308-0CC00-0CP0
	2.8 ... 9	90	3RK1308-0CD00-0CP0
	4 ... 12	120	3RK1308-0CE00-0CP0
Fail-safe reversing starter			
3RK1308-0DE00-0CP0	0.1 ... 0.4	4	3RK1308-0DA00-0CP0
	0.3 ... 1	10	3RK1308-0DB00-0CP0
	0.9 ... 3	30	3RK1308-0DC00-0CP0
	2.8 ... 9	90	3RK1308-0DD00-0CP0
	4 ... 12	120	3RK1308-0DE00-0CP0

	design of the product	supply voltage at DC rated value V	forward potential group from left	Article No.
BaseUnit, with spring-loaded terminals (push-in)				
for dummy modules				
6ES7193-6BP00-0BA0	BU15-P16+A0+2B, dark, looping through the potential group	24	Yes	6ES7193-6BP00-0BA0
	BU15-P16+A0+2D, light, opening a new potential group	24	No	6ES7193-6BP00-0DA0

	control supply voltage at DC rated value V	product function on-site operation	digital inputs parameterizable	Article No.
3DI/LC control module, with spring-loaded terminals (push-in)				
3RK1908-1AA00-0BP0	20.4 ... 28.8	Yes	Yes	3RK1908-1AA00-0BP0

	design of the product	operating voltage of AC supply for motor starter V	for ET 200SP e-Starter V	supply voltage of DC supply V	Article No.
BaseUnit, with spring-loaded terminals (push-in)					
for e-starters and motor starters					
3RK1908-0AP00-0AP0	For AC/DC feed in	500	480	24	3RK1908-0AP00-0AP0
	For DC feed in	--	--	24	3RK1908-0AP00-0BP0
	For AC feed in	500	480	--	3RK1908-0AP00-0CP0
	Without feed in	--	--	--	3RK1908-0AP00-0DP0
for fail-safe e-Starters and motor starters					

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Selection and ordering data (continued)

	design of the product	operating voltage of AC supply for motor starter V	for ET 200SP e-Starter V	supply voltage of DC supply V	Article No.
3RK1908-0AP00-0EP0	with AC infeed, with F-DI	500	480	--	3RK1908-0AP00-0EP0
	without infeed, F-DI	--	--	--	3RK1908-0AP00-0FP0
	with AC infeed, with F-DI infeed	500	480	--	3RK1908-0AP00-0GP0
	with AC infeed, with F-DI loop-through	500	480	--	3RK1908-0AP00-0HP0
	without AC/DC infeed, with F-DI loop-through	--	--	--	3RK1908-0AP00-0JP0
	without AC/DC infeed, with F-DI infeed	--	--	--	3RK1908-0AP00-0KP0

	product designation	design of the product	Article No.
Accessories			
6ES7133-6CV15-1AM0	Base Unit cover 15 mm	15 mm	6ES7133-6CV15-1AM0
3RK1908-1CA00-0BP0	Base Unit cover 30 mm	for protection of empty slots, 30 mm	3RK1908-1CA00-0BP0
3RK1908-1DA00-2BP0	Infeed bus cover	For ET 200SP	3RK1908-1DA00-2BP0
3RK1908-1EA00-1BP0	Mechanical bracket	Mechanical, for ET 200SP	3RK1908-1EA00-1BP0
3RW4928-8VB00	Fan	Can be used for 3RK1308	3RW4928-8VB00
3RK1911-6EA00	Motor suppression module	Square	3RK1911-6EA00
3RK1911-6EB00	Motor suppression module	Round	3RK1911-6EB00

Technical specifications

More information

SiePortal, **see** www.siemens.com/product_catalog_siep?3RK1308

Equipment Manual, **see** https://support.industry.siemens.com/cs/ww/en/view/109479973

FAQs, **see** https://support.industry.siemens.com/cs/ww/en/ps/21800/faq

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Technical specifications

Article number		3RK1308-0A.00-0CP0 3RK1308-0B.00-0CP0	3RK1308-0C.00-0CP0 3RK1308-0D.00-0CP0
product category		Motor starter	
General technical data			
Width x Height x Depth	mm	30 × 142 × 150	
design of the switching contact		Hybrid	
type of the motor protection		solid-state	
installation altitude at height above sea level maximum	m	4 000; For derating see manual	
mounting position		Vertical, horizontal (observe derating)	
fastening method		pluggable in BaseUnit	
ambient temperature			
• during operation	°C	-25 ... +60	
• during transport	°C	-40 ... +70	
• during storage	°C	-40 ... +70	
relative humidity during operation	%	10 ... 95	
vibration resistance		15 mm to 6 Hz; 2 g to 500 Hz	
shock resistance		6 g / 11 ms	
protection class IP on the front according to IEC 60529		IP20	
touch protection on the front according to IEC 60529		finger-safe	
performance level (PL) according to ISO 13849-1		--	PL e
Safety Integrity Level (SIL) according to IEC 62061		--	SIL 3
type of coordination		1	

Article number		3RK1308-0.A00-0CP0	3RK1308-0.B00-0CP0	3RK1308-0.C00-0CP0	3RK1308-0.D00-0CP-0	3RK1308-0.E00-0CP0
product category		Motor starter				
Electrical data						
supply voltage at DC rated value	V	24				
operating power at AC-53a at 400 V rated value	kW	0.12	0.25	1.1	4	5.5
operating frequency rated value	Hz	50 ... 60				
operating voltage rated value maximum	V	500				
maximum short-circuit current breaking capacity (Icu)						
• at 400 V rated value	kA	55				
• at 500 V rated value	kA	55				
adjustable current response value current of the current-dependent overload release	A	0.1 ... 0.4	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
ampacity when starting maximum	A	4	10	30	90	120
maximum permissible voltage for protective separation between main and auxiliary circuit	V	500				
insulation voltage rated value	V	500				
trip class		CLASS OFF / 5 / 10 adjustable				

Article number		3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0 3RK1908-0AP00-0GP0 3RK1908-0AP00-0HP0	3RK1908-0AP00-0DP0 3RK1908-0AP00-0JP0 3RK1908-0AP00-0KP0
product designation		BaseUnit			
General technical data					
Width x Height x Depth		30 × 215 × 75			
ambient temperature					
• during operation		-25 ... +60			

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Technical specifications (continued)

Article number	3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0 3RK1908-0AP00-0GP0 3RK1908-0AP00-0HP0	3RK1908-0AP00-0DP0 3RK1908-0AP00-0JP0 3RK1908-0AP00-0KP0
• during storage	-40 ... +70			
• during transport	-40 ... +70			
protection class IP on the front according to IEC 60529	IP20			
touch protection on the front according to IEC 60529	finger-safe			
Connections/ Terminals				
type of connectable conductor cross-sections				
at the inputs for supply voltage				
- solid	1x 0.5 ... 2.5 mm²		--	
- finely stranded with core end processing	1x 0.5 ... 2.5 mm²		--	
- finely stranded without core end processing	1x 0,5 ... 2,5 mm²		--	
- for AWG cables solid	1x 20 ... 12		--	
for supply				
- solid	1x 1 ... 6 mm²	--	1x 1 ... 6 mm²	--
- finely stranded with core end processing	1x 1 ... 6 mm²	--	1x 1 ... 6 mm²	--
- finely stranded without core end processing	1x 1 ... 6 mm²	--	1x 1 ... 6 mm²	--
- for AWG cables	1x 18 ... 10	--	1x 18 ... 10	--
for load-side outgoing feeder				
- solid	1x 0,5 ... 2,5 mm²			
- finely stranded with core end processing	1x 0,5 ... 2,5 mm²			
- finely stranded without core end processing	1x 0,5 ... 2,5 mm²			
- for AWG cables	1x 20 ... 12			
type of electrical connection for auxiliary and control circuit	spring-loaded terminals (push-in)			
Miscellaneous				
shape of the screwdriver tip	Slot			
size of the screwdriver tip	Standard screwdriver 0.6 mm x 3.5 mm			

Article number		3RK1908-1AA00-0BP0
product designation		3DI/LC control module
General technical data		
Width x Height x Depth	mm	30 × 54.5 × 42.3
design of the product		Accessories
number of digital inputs		4
installation altitude at height above sea level maximum	m	2 000
mounting position		vertical, horizontal, flat
fastening method		Can be plugged onto motor starters
ambient temperature		
• during operation	°C	-25 ... +60

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Technical specifications (continued)

Article number		3RK1908-1AA00-0BP0
• during transport	°C	-40 ... +70
• during storage	°C	-40 ... +70
Connections/ Terminals		
connectable conductor cross-section for auxiliary contacts		
• solid or stranded	mm²	0.2 ... 1.5
• finely stranded with core end processing	mm²	0.25 ... 1.5
• finely stranded without core end processing	mm²	0.2 ... 1.5
AWG number as coded connectable conductor cross section for auxiliary contacts		24 ... 16
type of electrical connection for auxiliary and control circuit		spring-loaded terminals (push-in)
Electrical data		
type of voltage of the control supply voltage		DC
control supply voltage at DC rated value	V	20.4 ... 28.8
Miscellaneous		
shape of the screwdriver tip		Slot
size of the screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm

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Overview



- For pneumatic control of actuators with ET 200SP
- Can be used together with system and IO components of the ET 200SP distributed I/O system.
- Product of the product partner Bürkert Fluid Control Systems, and can only be obtained from Bürkert Fluid Control Systems.

Note

Product partners are external companies outside Siemens AG and its associated companies. Information and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the respective product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners. Also refer to the note on disclaimer/use of hyperlinks under "More information".

Benefits

- High process safety by using non-return valves and pneumatic infeed modules with pressure monitoring.
- System-wide detailed diagnostics in plain text, and also locally on an LC display
- Quick and easy valve change during operation (hot swapping)
- Reduced number of components in the control cabinet (compact control cabinet is possible)
- Quick and easy installation due to full hardware integration: Physical interfaces of pneumatic and I/O components are fully compatible
- Fast and error-free configuration and diagnostics due to full software integration into the Siemens ecosystem (Step 7 Classic, PCS 7, PCS neo, TIA Portal):
  Bürkert pneumatic modules are treated like Siemens I/O modules in configuration and programming

Application

Valve terminals are widely used in industrial automation, and serve as pilot valves for controlling actuators in the food, pharmaceutical and water treatment industries. In combination with the AirLINE SP, type 8647 from the Bürkert Co., the ET 200SP forms a universal interface between process and plant control, and enables the flexible, modular structure of pilot valves and I/O modules. The valve terminal can optionally be equipped with the AirLINE Quick Adapter for installation on the control cabinet floor, which further reduces the installation space required in the control cabinet and significantly simplifies pneumatic installation.

More information

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly, see under this link.

Disclaimer of liability

This information and the descriptions have been compiled with great care. However, it is not possible for Siemens to verify that the data supplied by product partners is complete, correct and up-to-date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the products for the user per se.

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Overview



In terms of design and functionality, the SIMATIC ET 200SP PS single-phase load power supply with automatic range switching of the input voltage is perfectly matched to the SIMATIC ET 200SP. The SIMATIC component and the power supply are wired by means of uniform push-in terminal technology. The 24 V supply provides power to the ET 200SP system components such as the interface module, technology module and communication module, as well as the digital or analog inputs/outputs. Comprehensive certifications, such as UL or GL, facilitate universal use. Its extremely flat design also makes this power supply ideally suited for installation in compact on-site control boxes.

Selection and ordering data

SIMATIC ET 200SP PS Stabilized power supply for SIMATIC ET 200SP Input: 120/230 V AC Output: 24 V DC/5 A	**6EP7133-6AB00-0BN0**
SIMATIC ET 200SP PS Stabilized power supply for SIMATIC ET 200SP Input: 120/230 V AC Output: 24 V DC/10 A	**6EP7133-6AE00-0BN0**

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Technical specifications

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC	SIMATIC
type of current supply	24 V/5 A	24 V/10 A
General information		
Technical Product Detail Page	https://i.siemens.com/1P6EP7133-6AB00-0BN0	https://i.siemens.com/1P6EP7133-6AE00-0BN0
input		
type of the power supply network	1-phase AC	1-phase AC
supply voltage at AC	Automatic range selection	Automatic range selection
supply voltage	120 V/230 V	120 V/230 V
input voltage 1 at AC	85 ... 132 V	85 ... 132 V
input voltage 2 at AC	170 ... 264 V	170 ... 264 V
wide range input	No	No
overvoltage overload capability	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms
buffering time for rated value of the output current in the event of power failure minimum	20 ms	20 ms
operating condition of the mains buffering	at Vin = 93/187 V	at Vin = 93/187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	47 ... 63 Hz	47 ... 63 Hz
input current		
• at rated input voltage 120 V	2.16 A	4.34 A
• at rated input voltage 230 V	1.22 A	1.92 A
current limitation of inrush current at 25 °C maximum	45 A	60 A
I2t value maximum	3.15 A^2·s	6.3 A^2·s
fuse protection type	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
fuse protection type in the feeder	recommended LS switch: B/C 6 A/3 A	recommended LS switch: B/C 10 A/6 A
output		
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	24 V	24 V
output voltage		
• at output 1 at DC rated value	24 V	24 V
	24 V	24 V
output voltage adjustable	Yes; via potentiometer	Yes; via potentiometer
adjustable output voltage	22.8 ... 28 V	22.8 ... 28 V
relative overall tolerance of the voltage	3 %	3 %
relative control precision of the output voltage		
• on slow fluctuation of input voltage	0.1 %	0.1 %
• on slow fluctuation of ohm loading	1 %	1 %
residual ripple		
• maximum	150 mV	150 mV
• typical	50 mV	50 mV
voltage peak		
• maximum	240 mV	240 mV
• typical	150 mV	150 mV
display version for normal operation	Green LED for 24 V OK	Green LED for 24 V OK
type of signal at output	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"
behavior of the output voltage when switching on	Overshoot of Vout < 3 %	Overshoot of Vout < 3 %
response delay maximum	0.3 s	0.3 s
voltage increase time of the output voltage		
• typical	30 ms	30 ms
output current		
• rated value	5 A	10 A
• rated range	0 ... 6 A; 5 A up to +60°C; +60 ... +70 °C: Derating 3%/K	0 ... 12 A; 10 A up to +60°C; +60 ... +70 °C: Derating 3%/K
	5 A	10 A
supplied active power typical	120 W	240 W
short-term overload current		
• on short-circuiting during the start-up typical	15 A	30 A

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Technical specifications (continued)

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC	SIMATIC
type of current supply	24 V/5 A	24 V/10 A
• at short-circuit during operation typical	15 A	30 A
duration of overloading capability for excess current		
• on short-circuiting during the start-up	800 ms	750 ms
• at short-circuit during operation	800 ms	800 ms
bridging of equipment	Yes	Yes
number of parallel-switched equipment resources	2	2
efficiency		
efficiency in percent	88 %	90 %
power loss [W]		
• at rated output voltage for rated value of the output current typical	17 W	26 W
• during no-load operation maximum	2.7 W	2.8 W
closed-loop control		
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.3 %	0.3 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	3 %	3 %
setting time		
• load step 10 to 90% typical	1 ms	1 ms
• load step 90 to 10% typical	1 ms	1 ms
protection and monitoring		
design of the overvoltage protection	protection against overvoltage in case of internal fault Vout < 31.8 V	protection against overvoltage in case of internal fault Vout < 31.8 V
property of the output short-circuit proof	Yes	Yes
design of short-circuit protection	Constant current characteristic	Constant current characteristic
response value current limitation	7 ... 7.5 A	14 ... 15 A
overcurrent overload capability		
• in normal operation	overload capability 150 % Iout rated up to 5 s/min	overload capability 150 % Iout rated up to 5 s/min
enduring short circuit current RMS value		
• typical	7 A	14.1 A
safety		
galvanic isolation between input and output	Yes	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class I	Class I
leakage current		
• maximum	3.5 mA	3.5 mA
• typical	1 mA	1 mA
protection class IP	IP20	IP20
EMC		
standard		
• for emitted interference	EN 61000-6-3 Class B	EN 61000-6-3 Class B
• for mains harmonics limitation	EN 61000-3-2	EN 61000-3-2
• for interference immunity	EN 61000-6-2	EN 61000-6-2
standards, specifications, approvals		
certificate of suitability		
• CE marking	Yes	Yes
• UL approval	Yes; cULus-Listed (UL61010-2-201, CSA C22.2 No.142)	Yes; cULus-Listed (UL61010-2-201, CSA C22.2 No.142)
• EAC approval	Yes	Yes
• NEC Class 2	No	No
type of certification		
• CB-certificate	Yes	Yes
MTBF at 40 °C	1 598 441 h	1 114 510 h
standards, specifications, approvals hazardous environments		
certificate of suitability		

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Technical specifications (continued)

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC	SIMATIC
type of current supply	24 V/5 A	24 V/10 A
• IECEx	Yes; IECEx Ex ec nC IIC T3 Gc	Yes; IECEx Ex ec nC IIC T3 Gc
• ATEX	Yes; ATEX (EX) II 3G Ex ec nC IIC T3 Gc	Yes; ATEX (EX) II 3G Ex ec nC IIC T3 Gc
• ULhazloc approval	Yes	Yes
• UKEX	Yes	Yes
• CCC for hazardous zone according to GB standard	Yes	Yes
standards, specifications, approvals marine classification		
shipbuilding approval	Yes	Yes
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	No	No
• French marine classification society (BV)	Yes	Yes
• Det Norske Veritas (DNV)	Yes	Yes
• Lloyds Register of Shipping (LRS)	No	No
standards, specifications, approvals Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO2 eq]		
• total	474.8 kg	725 kg
• during manufacturing	9.4 kg	13.2 kg
• during operation	465 kg	711.1 kg
• after end of life	0.35 kg	0.48 kg
ambient conditions		
ambient temperature		
• during operation	-30 ... +70 °C; with natural convection	-30 ... +70 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
connection method		
type of electrical connection	push-in terminals	push-in terminals
• at input	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm² single-core/finely stranded	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm² single-core/finely stranded
• at output	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm²	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm²
• for auxiliary contacts	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm²	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm²
• for signaling contact	2 push-in terminals for 0.2 ... 2.5 mm²	2 push-in terminals for 0.2 ... 2.5 mm²
removable terminal at input	Yes	Yes
removable terminal at output	Yes	Yes
mechanical data		
width × height × depth of the enclosure	160 mm × 117 mm × 74 mm	160 mm × 117 mm × 74 mm
installation width × mounting height	160 mm × 174 mm	160 mm × 174 mm
required spacing		
• top	50 mm	50 mm
• bottom	50 mm	50 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
• DIN-rail mounting	Yes	Yes
• S7 rail mounting	No	No
• wall mounting	No	No
housing can be lined up	Yes	Yes
net weight	0.5 kg	0.7 kg
accessories		
electrical accessories	Redundancy module, buffer module, selectivity module, DC UPS	Redundancy module, buffer module, selectivity module, DC UPS
further information internet links		
internet link		

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Technical specifications (continued)

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC	SIMATIC
type of current supply	24 V/5 A	24 V/10 A
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
additional information		
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



With the BaseUnits (BUs), the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (gaps without I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High EMC interference immunity:
  - self-assembling shielded backplane bus
  - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module
  - system-integrated, space-saving shield connection for quick installation
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical and EMC loads
- Optional module-specific color coding of the terminals according to the color code CC
- Optional equipment marking using slide-in equipment labeling plates

An ET 200SP station can be expanded via one BU-Send BaseUnit with a BA-Send BusAdapter plugged onto it with up to 16 modules from the ET 200AL series of I/O devices with IP67 protection.

Selection and ordering data

Type A0 BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP20-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP20-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BA0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BA0**
Type B0 BaseUnits	
BU20-P12+A4+0B	
BU type B0; BaseUnit (dark) with 12 process terminals (1 ... 12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the potential group; 1 unit	
• Pack of 1 unit	**6ES7193-6BP20-0BB0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BB0**
Type B1 BaseUnits	
BU20-P12+A0+4B	
BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the potential group; 1 unit	
• Pack of 1 unit	**6ES7193-6BP20-0BB1**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP20-2BB1**
Type C0 BaseUnits	
BU20-P6+A2+4D	**6ES7193-6BP20-0DC0**
BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new potential group	
Type C1 BaseUnits	
BU20-P6+A2+4B	**6ES7193-6BP20-0BC1**
BU type C1; BaseUnit (dark) with 6 push-in terminals (1 ... 6) to the module and 2 AUX terminals; bridged to the left	
Type A1 BaseUnits (with temperature detection)	

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Selection and ordering data (continued)

BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new potential group (max. 10 A)	**6ES7193-6BP40-0DA1**
BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	**6ES7193-6BP00-0DA1**
BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the potential group	**6ES7193-6BP40-0BA1**
BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	**6ES7193-6BP00-0BA1**
Type F0 BaseUnits	
BU20-P8+A4+0B BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the potential group	**6ES7193-6BP20-0BF0**
BaseUnits type U0	
BU20-P16+A0+2D BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	
• Pack of 1 unit	**6ES7193-6BP00-0DU0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	
• Pack of 1 unit	**6ES7193-6BP00-0BU0**
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	**6ES7193-6BP00-2BU0**
BaseUnit for redundant setup	
BaseUnit type M0 With 2 slots to accommodate R1-capable interface modules IM 155-6 PN R1; incl. server module	**6ES7193-6BR00-0HM0**
Station expansion with IP67 I/O system ET 200AL	
BaseUnit BU-Send	**6ES7193-6BN00-0NE0**
ET 200SP BA-Send 1 x FC BusAdapter	**6ES7193-6AS00-0AA0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**
Color-coded labels	
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP01-2MA0**

Selection and ordering data (continued)

• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	**6ES7193-6CP01-4MA0**
• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP02-2MA0**
• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	**6ES7193-6CP02-4MA0**
• Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP03-2MA0**
• Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP04-2MA0**
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**
• Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, BU type A1 with push-in terminals; 10 units	**6ES7193-6CP74-2AA0**
• Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units	**6ES7193-6CP81-2AB0**
• Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units	**6ES7193-6CP82-2AB0**
• Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units	**6ES7193-6CP83-2AB0**
• Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units	**6ES7193-6CP41-2MB0**
• Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units	**6ES7193-6CP84-2AC0**
• Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units	**6ES7193-6CP85-2AC0**
• Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units	**6ES7193-6CP86-2AC0**

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Technical specifications

Article number	6ES7193-6BP20-0DA0 BaseUnit Type A0, BU15-P16+A10+2D	6ES7193-6BP00-0DA0 BaseUnit Type A0, BU15-P16+A0+2D	6ES7193-6BP20-0BA0 BaseUnit Type A0, BU15-P16+A10+2B	6ES7193-6BP00-0BA0 BaseUnit Type A0, BU15-P16+A0+2B
General information				
Product type designation	BU type A0	BU type A0	BU type A0	BU type A0
Hardware configuration				
Slots				
• Number of slots	1; Type A0	1; Type A0	1; Type A0	1; Type A0
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• system-integrated shield connection	Yes; Optional	Yes; Optional	Yes; Optional	Yes; Optional
• Conductor cross-section, min.	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26
• Conductor cross-section, max.	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14
• Number of process terminals to I/O module	16	16	16	16; Pro slot
• Number of terminals to AUX bus	10	0	10	0
• Number of add-on terminals	0	0	0	0
• Number of terminals with connection to P1 and P2 bus	2	2	2	2; Pro slot
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	141 mm	117 mm	141 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	50 g	40 g	50 g	40 g

Article number	6ES7193-6BP20-0BB0 BaseUnit Type B0, BU20-P12+A4+0B	6ES7193-6BP20-0BB1 BaseUnit Type B1, BU20-P12+A0+4B, PU 1	6ES7193-6BP20-0DC0 BaseUnit Type C0, BU20-P6+A2+4D	6ES7193-6BP20-0BC1 BaseUnit Type C1, BU20-P6+A2+4B	6ES7193-6BP20-0BF0 BaseUnit Type F0, BU20-P8+A4+0B
General information					
Product type designation	BU type B0	BU type B1	BU type C0	BU type C1	BU type F0
Hardware configuration					
Slots					
• Number of slots	1	1	1	1; Type C1	1; Type F0
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Connection method					
Terminals					

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Technical specifications (continued)

Article number	6ES7193-6BP20-0BB0 BaseUnit Type B0, BU20-P12+A4+0B	6ES7193-6BP20-0BB1 BaseUnit Type B1, BU20-P12+A0+4B, PU 1	6ES7193-6BP20-0DC0 BaseUnit Type C0, BU20-P6+A2+4D	6ES7193-6BP20-0BC1 BaseUnit Type C1, BU20-P6+A2+4B	6ES7193-6BP20-0BF0 BaseUnit Type F0, BU20-P8+A4+0B
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	
• system-integrated shield connection	Yes; Optional	No	Yes; Optional	Yes; Optional	Yes; Optional
• Conductor cross-section, min.	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	
• Conductor cross-section, max.	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	
• Number of process terminals to I/O module	12; Pro slot	12; Pro slot	12; Pro slot	16; Pro slot	
• Number of terminals to AUX bus	0	0	0	0	
• Number of add-on terminals	0	0	0	0	
• Number of terminals with connection to P1 and P2 bus	0; Pro slot	0; Pro slot	0; Pro slot	2; Pro slot	
Dimensions					
Width	20 mm	20 mm	20 mm	20 mm	20 mm
Height	117 mm	117 mm	117 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm	35 mm
Weights					
Weight, approx.	48 g	48 g	47 g	47 g	48 g

Article number	6ES7193-6BP40-0DA1 BaseUnit Type A1, BU15-P16+A0+12D/T	6ES7193-6BP00-0DA1 BaseUnit Type A1, BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 BaseUnit Type A1, BU15-P16+A0+12B/T	6ES7193-6BP00-0BA1 BaseUnit Type A1, BU15-P16+A0+2B/T
General information				
Product type designation	BU type A1	BU type A1	BU type A1	BU type A1
Hardware configuration				
Slots				
• Number of slots	1; Type A1	1; Type A1	1; Type A1	1; Type A1
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• system-integrated shield connection	Yes; Optional	Yes; Optional	Yes; Optional	Yes; Optional
• Conductor cross-section, min.	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26
• Conductor cross-section, max.	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14
• Number of process terminals to I/O module	16	16	16	16
• Number of terminals to AUX bus	0	0	0	0
• Number of add-on terminals	2x5	0	2x5	0
• Number of terminals with connection to P1 and P2 bus	2	2	2	2
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	141 mm	117 mm	141 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	50 g	40 g	50 g	40 g

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Technical specifications (continued)

Article number	6ES7193-6BP00-0DU0 BaseUnit Type U0, BU20-P16+A0+2D, PU 1	6ES7193-6BP00-0BU0 BaseUnit Type U0, BU20-P16+A0+2B, PU 1
General information		
Product type designation	BU type U0	BU type U0
Hardware configuration		
Slots		
• Number of slots	1	1
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	3 000 m	3 000 m
Connection method		
Terminals		
• Terminal type	Push-in terminal	Push-in terminal
• system-integrated shield connection	Yes; Optional	Yes; Optional
• Conductor cross-section, min.	0.14 mm²; 0.2 mm² without wire end ferrule	0.14 mm²; 0.2 mm² without wire end ferrule
• Conductor cross-section, max.	2.5 mm²; 1.5 mm² with wire end ferrule	2.5 mm²; 1.5 mm² with wire end ferrule
• Number of process terminals to I/O module	16	16
• Number of terminals to AUX bus	0	0
• Number of add-on terminals	0	0
• Number of terminals with connection to P1 and P2 bus	2	2
Dimensions		
Width	20 mm	20 mm
Height	117 mm	117 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	50 g	50 g

Article number	6ES7193-6BR00-0HM0 BaseUnit Type M0
General information	
Product type designation	BU type M0
Hardware configuration	
Slots	
• Number of slots	2
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	100 mm
Height	141 mm
Depth	29 mm
Weights	
Weight, approx.	142 g

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Technical specifications (continued)

Article number	6ES7193-6BN00-0NE0 ET 200SP, BaseUnit BU-Send
Hardware configuration	
Slots	
• Number of slots	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	20 mm
Height	117 mm
Depth	35 mm
Weights	
Weight, approx.	30 g

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Overview



With the BaseUnits (BUs), the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (missing I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High immunity to electromagnetic interference due to
  - self-assembling shielded backplane bus
  - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module
  - system-integrated, space-saving shield connection for quick installation
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical load capacity
- Optional module-specific color coding of the terminals according to the color code CC
- Optional equipment marking using slide-in equipment labeling plates

An ET 200SP station can be expanded via one BU-Send BaseUnit with a BA-Send BusAdapter plugged onto it with up to 16 modules from the ET 200AL series of I/O devices with IP67 protection.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS BaseUnits type A0	
BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
SIPLUS BaseUnits type A1 (with temperature detection)	
BU15-P16+A0+12D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	**6AG1193-6BP40-7DA1**
BU15-P16+A0+2D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA1**
BU15-P16+A0+12B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	**6AG1193-6BP40-7BA1**
BU15-P16+A0+2B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA1**
SIPLUS BaseUnits type B0	
BU20-P12+A4+0B (Extended temperature range and exposure to environmental substances) BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group; 1 unit	**6AG1193-6BP20-7BB0**
SIPLUS BaseUnits type B1	
BU20-P12+A0+4B (Extended temperature range and exposure to environmental substances)	**6AG1193-6BP20-7BB1**

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Selection and ordering data (continued)

BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; 1 unit	
SIPLUS BaseUnits type C0	
BU20-P6+A2+4D (Extended temperature range and exposure to environmental substances) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and 2 AUX terminals; new load group	**6AG1193-6BP20-7DC0**
SIPLUS BaseUnits type F0	
BU20-P8+A4+0B (Extended temperature range and exposure to environmental substances) BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group	**6AG1193-6BP20-2BF0**
SIPLUS BaseUnits type U0	
BU20-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DU0**
BU20-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	**6AG1193-6BP00-7BU0**
SIPLUS BaseUnits type M0 (Extended temperature range and exposure to environmental substances)	
For redundant configuration, with 2 slots to accommodate R1-capable interface modules IM 155-6 PN R1; incl. server module	**6AG1193-6BR00-7HM0**
Accessories	
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1 without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0	**6AG1193-6AB00-0AA0**
Other accessories	See SIMATIC ET 200SP BaseUnits

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Technical specifications

Article number	6AG1193-6BP00-7BA1 SIPLUS ET 200SP BU15-P16+A0+2B/T	6AG1193-6BP00-7DA1 SIPLUS ET 200SP BU15-P16+A0+2D/T	6AG1193-6BP40-7BA1 SIPLUS ET 200SP BU15-P16+A0+12B/T	6AG1193-6BP40-7DA1 SIPLUS ET 200SP BU15-P16+A0+12D/T
General information				
Product type designation	BU type A1	BU type A1	BU type A1	BU type A1
based on	6ES7193-6BP00-0BA1	6ES7193-6BP00-0DA1	6ES7193-6BP40-0BA1	6ES7193-6BP40-0DA1
Hardware configuration				
Slots				
• Number of slots	1; Type A1	1; Type A1	1; Type A1	1; Type A1
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		

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Technical specifications (continued)

Article number	6AG1193-6BP00-7BA1 SIPLUS ET 200SP BU15-P16+A0+2B/T	6AG1193-6BP00-7DA1 SIPLUS ET 200SP BU15-P16+A0+2D/T	6AG1193-6BP40-7BA1 SIPLUS ET 200SP BU15-P16+A0+12B/T	6AG1193-6BP40-7DA1 SIPLUS ET 200SP BU15-P16+A0+12D/T
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• system-integrated shield connection	Yes; Optional	Yes; Optional	Yes; Optional	Yes; Optional
• Conductor cross-section, min.	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26
• Conductor cross-section, max.	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14
• Number of process terminals to I/O module	16	16	16	16
• Number of terminals to AUX bus	0	0	0	0
• Number of add-on terminals	0	0	2x5	2x5
• Number of terminals with connection to P1 and P2 bus	2	2	2	2
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	117 mm	117 mm	141 mm	141 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	40 g	40 g	50 g	50 g

Article number	6AG1193-6BP20-7BB0 SIPLUS ET 200SP BU20-P12+A4+0B	6AG1193-6BP20-7BB1 SIPLUS ET 200SP BU20-P12+A0+4B TYP B1	6AG1193-6BP20-7DC0 SIPLUS ET 200SP BU20-P6+A2+4D
General information			
Product type designation	BU type B0	BU type B1	BU type C0
based on	6ES7193-6BP20-0BB0	6ES7193-6BP20-0BB1	6ES7193-6BP20-0DC0
Hardware configuration			
Slots			
• Number of slots	1	1	1
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax

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Technical specifications (continued)

Article number	6AG1193-6BP20-7BB0 SIPLUS ET 200SP BU20-P12+A4+0B	6AG1193-6BP20-7BB1 SIPLUS ET 200SP BU20-P12+A0+4B TYP B1	6AG1193-6BP20-7DC0 SIPLUS ET 200SP BU20-P6+A2+4D
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	3 000 m	3 000 m	3 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1193-6BP20-7BB0 SIPLUS ET 200SP BU20-P12+A4+0B	6AG1193-6BP20-7BB1 SIPLUS ET 200SP BU20-P12+A0+4B TYP B1	6AG1193-6BP20-7DC0 SIPLUS ET 200SP BU20-P6+A2+4D
Connection method			
Terminals			
• Terminal type	Push-in terminal		Push-in terminal
• system-integrated shield connection	Yes; Optional		Yes; Optional
• Conductor cross-section, min.	0.14 mm²; AWG 26		0.14 mm²; AWG 26
• Conductor cross-section, max.	2.5 mm²; AWG 14		2.5 mm²; AWG 14
• Number of process terminals to I/O module	12; Pro slot		12; Pro slot
• Number of terminals to AUX bus	0		0
• Number of add-on terminals	0		0
• Number of terminals with connection to P1 and P2 bus	0; Pro slot		0; Pro slot
Dimensions			
Width	20 mm	20 mm	20 mm
Height	117 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm
Weights			
Weight, approx.	48 g	48 g	47 g

Article number	6AG1193-6BP20-2BF0 SIPLUS ET 200SP BU20-P8+A4+0B	6AG1193-6BP00-7BU0 SIPLUS ET 200SP BU20-P16+A0+2B	6AG1193-6BP00-7DU0 SIPLUS ET 200SP BU20-P16+A0+2D	6AG1193-6BR00-7HM0 SIPLUS ET 200SP BU-Typ M0
General information				
Product type designation	BU type F0	BU type U0	BU type U0	BU type M0
based on	6ES7193-6BP20-0BF0	6ES7193-6BP00-0BU0	6ES7193-6BP00-0DU0	6ES7193-6BR00-0HM0
Hardware configuration				
Slots				
• Number of slots	1; Type F0	1	1	2
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	3 000 m	3 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request

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Technical specifications (continued)

Article number	6AG1193-6BP20-2BF0 SIPLUS ET 200SP BU20-P8+A4+0B	6AG1193-6BP00-7BU0 SIPLUS ET 200SP BU20-P16+A0+2B	6AG1193-6BP00-7DU0 SIPLUS ET 200SP BU20-P16+A0+2D	6AG1193-6BR00-7HM0 SIPLUS ET 200SP BU-Typ M0
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
- Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
- Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method				
Terminals				
• Terminal type		Push-in terminal	Push-in terminal	
• system-integrated shield connection	Yes; Optional		Yes; Optional	
• Conductor cross-section, min.		0.14 mm²; 0.2 mm² without wire end ferrule	0.14 mm²; 0.2 mm² without wire end ferrule	
• Conductor cross-section, max.		2.5 mm²; 1.5 mm² with wire end ferrule	2.5 mm²; 1.5 mm² with wire end ferrule	
• Number of process terminals to I/O module		16	16	
• Number of terminals to AUX bus		0	0	
• Number of add-on terminals		0	0	
• Number of terminals with connection to P1 and P2 bus		2	2	

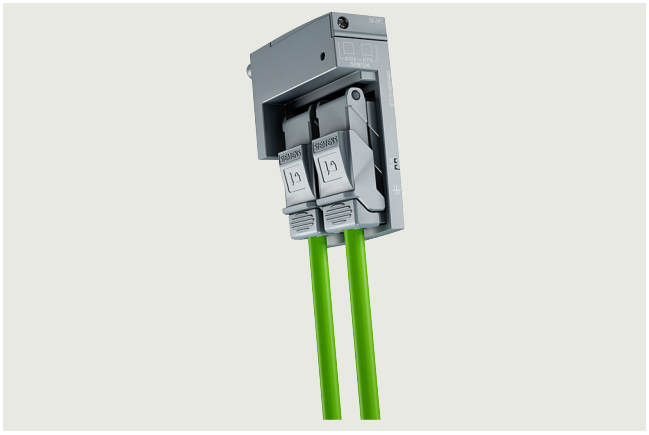
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Technical specifications (continued)

Article number	6AG1193-6BP20-2BF0 SIPLUS ET 200SP BU20-P8+A4+0B	6AG1193-6BP00-7BU0 SIPLUS ET 200SP BU20-P16+A0+2B	6AG1193-6BP00-7DU0 SIPLUS ET 200SP BU20-P16+A0+2D	6AG1193-6BR00-7HM0 SIPLUS ET 200SP BU-Typ M0
Dimensions				
Width	20 mm	20 mm	20 mm	100 mm
Height	117 mm	117 mm	117 mm	141 mm
Depth	35 mm	35 mm	35 mm	29 mm
Weights				
Weight, approx.	48 g	50 g	50 g	142 g

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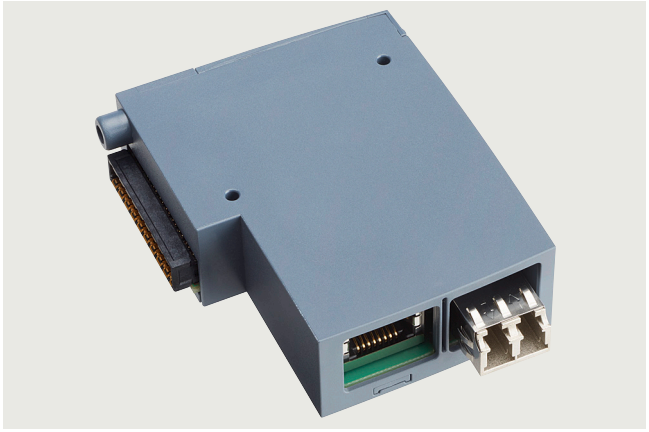
Overview



SIMATIC BA 2xFC BusAdapter for direct laying of the PROFINET cable via FastConnect connection



SIMATIC BA 2xLC-LD BusAdapter with 2 LC-LD sockets, for use in redundant systems, max. cable length 20 km



SIMATIC BA LC/RJ45 BusAdapter for use as a system-integrated media converter from copper (RJ45) to multimode glass fiber (LC).

Overview (continued)



SIMATIC BA LC-LD/M12 BusAdapter for use as a system-integrated media converter from copper (M12) to single-mode glass fiber (LC-LD).



ET 200SP BA-Send BusAdapter for expansion of an ET 200SP station with ET 200AL modules

For SIMATIC ET 200SP, two types of BusAdapter (BA) are available for selection:

- ET 200SP "BA-Send" BusAdapter
  for expansion of an ET 200SP station with up to 16 modules from the ET 200AL I/O series with IP67 protection via an ET connection
- SIMATIC BusAdapter
  for the free selection of the connection system (pluggable or direct connection) and physical PROFINET connection (copper, POF, HCS or glass fiber) to devices with a SIMATIC BusAdapter interface. One further advantage of the SIMATIC BusAdapter: only the adapter needs to be replaced for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, or to repair defective RJ45 sockets.

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Selection and ordering data

BA 2xRJ45 BusAdapter For IM 155-6 PN ST, HF, R1	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter For IM 155-6 PN ST, HF; R1; for increased resistance to vibration and EMC loads	**6ES7193-6AF00-0AA0**
BA 2xM12 BusAdapter For IM 155-6 PN ST, HF; R1; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	**6ES7193-6AM00-0AA0**
BA 2xSCRJ BusAdapter For IM 155-6 PN HF; R1; fiber-optic cable connection for POF or PCF cables up to 250 m, with monitoring of attenuation	**6ES7193-6AP00-0AA0**
BA SCRJ/RJ45 BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x SCRJ glass fiber-optic cable connection, 1 x RJ45 connection	**6ES7193-6AP20-0AA0**
BA SCRJ/FC BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x SCRJ glass fiber-optic cable connection, 1 x FastConnect connection	**6ES7193-6AP40-0AA0**
BA 2xLC BusAdapter For IM 155-6 PN HF, R1; two glass fiber-optic cable connections	**6ES7193-6AG00-0AA0**
BA LC/RJ45 BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x LC connection, 1 x RJ45 connection	**6ES7193-6AG20-0AA0**
BA LC/FC BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x LC connection, 1 x FastConnect connection	**6ES7193-6AG40-0AA0**
BA 2xLC-LD BusAdapter For IM 155-6 PN HF, R1; two glass fiber-optic cable connections	**6ES7193-6AG50-0AA0**
BA LC-LD/RJ45 BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x LC-LD connection, 1 x RJ45 connection	**6ES7193-6AG60-0AA0**
BA LC-LD/M12 BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x LC-LD connection, 1 x M12 connection	**6ES7193-6AG70-0AA0**
M12-180/M12-180 IE connecting cable Preassembled with IE FC trailing cable GP, M12 plugs (D-coded, push-pull)	
0.5 m	**6XV1871-8AE50**
1.0 m	**6XV1871-8AH10**
1.5 m	**6XV1871-8AH15**
2.0 m	**6XV1871-8AH20**
3.0 m	**6XV1871-8AH30**
5.0 m	**6XV1871-8AH50**
10 m	**6XV1871-8AN10**
15 m	**6XV1871-8AN15**
MM FO CORD LC/LC Preassembled patch cable with 2x LC duplex connectors; 1.0 m	**6XV1843-5EH10-0AA0**
SM FO CORD LC/LC Preassembled patch cable with 2x LC duplex connectors; 1.0 m	**6XV1843-5FH10-0AA0**

Selection and ordering data (continued)

FO standard cable 50/125 MM FO standard cable preassembled with 2x LC duplex connectors, 5.0 m	**6XV1873-5AH50**
FO ROBUST CABLE 50/125 Robust MM FO cable preassembled with 2x LC duplex connectors, 10 m	**6XV1873-5RN10**
FC IE stripping tool	**6GK1901-1GA00**
IE FC RJ45 plug 2x2 Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet; 1 unit	**6GK1901-1BB10-2AA0**
Station expansion with IP67 I/O system ET 200AL	
ET 200SP BA-Send 1 x FC BusAdapter	**6ES7193-6AS00-0AA0**
BaseUnit BU-Send	**6ES7193-6BN00-0NE0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Unlatching strap for M12 BA 10 units, for push-pull PROFINET plug, e. g. when using the BA 2xM12 BusAdapter	**6ES7193-6DL00-2AA0**

Note:
You will find information on further passive components at the following link or at the following link.

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Technical specifications

Article number	6ES7193-6AR00-0AA0	6ES7193-6AF00-0AA0	6ES7193-6AM00-0AA0	6ES7193-6AP00-0AA0	6ES7193-6AP20-0AA0
	ET 200SP, Busadapter BA 2xRJ45	ET 200SP, Busadapter BA 2XFC	SIMATIC Busadapter BA 2xM12	ET 200SP, Busadapter BA 2xSCRJ	ET 200SP, Busadapter BA SCRJ/RJ45
General information					
Product type designation	BA 2x RJ45	BA 2x FC	BA 2x M12	BA 2x SCRJ	BA SCRJ/RJ45
Interfaces					
Number of PROFINET interfaces	1; 2 ports (switch) 2x RJ45	1; 2 port (switch) 2x FC	1; 2 ports (switch) 2x M12	1; 2 ports (switch) 2x SCRJ	1; 2 ports (switch) SCRJ/RJ45
Supports protocol for PROFINET IO					
• Number of RJ45 ports	2				1
• Number of FC (FastConnect) connections		2			
• Number of SCRJ ports				2	1
• Number of M12 ports			2		
- Cable length					
- PCF				100 m	100 m
- Plastic FOC (POF)				50 m	50 m
- Cu conductors	100 m	100 m	100 m		100 m
Ambient conditions					
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions					
Width	20 mm	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	73.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm	59 mm	59 mm
Weights					
Weight, approx.	46 g	53 g	59 g	50 g	50 g

Article number	6ES7193-6AP40-0AA0	6ES7193-6AG00-0AA0	6ES7193-6AG20-0AA0	6ES7193-6AG40-0AA0
	ET 200SP, Bus adapter BA SCRJ/FC	SIMATIC Busadapter BA 2XLC	SIMATIC Busadapter BA LC/RJ45	SIMATIC Bus adapter BA LC/FC
General information				
Product type designation	BA SCRJ/FC	BA 2x LC	BA LC/RJ45	BA LC/FC
Interfaces				
Number of PROFINET interfaces	1; 2 ports (switch) SCRJ/FC	1; 2 ports (switch) LC Multimode Glass Fibre	1; 2 ports (switch) LC / RJ45	1; 2 ports (switch) LC / FC
Supports protocol for PROFINET IO				
• Number of RJ45 ports			1	
• Number of FC (FastConnect) connections	1			1
• Number of SCRJ ports	1			
• Number of LC ports		2; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX
- Cable length				
- PCF	100 m			
- Plastic FOC (POF)	50 m			
- Cu conductors	100 m		100 m	100 m
- Multimode graded-index fiber 50/125 µm		3 km; min. transmit power -23.5 dB, min. receiver sensitivity -31 dB	3 km; min. transmit power -23.5 dB, min. receiver sensitivity -31 dB	3 km; min. transmit power -23.5 dB, min. receiver sensitivity -31 dB
- Multimode graded-index fiber 62.5/125 µm		3 km; min. transmit power -20 dB, min. receiver sensitivity -31 dB	3 km; min. transmit power -20 dB, min. receiver sensitivity -31 dB	3 km; min. transmit power -20 dB, min. receiver sensitivity -31 dB
Ambient conditions				
Altitude during operation relating to sea level				

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Technical specifications (continued)

Article number	6ES7193-6AP40-0AA0 ET 200SP, Bus adapter BA SCRJ/FC	6ES7193-6AG00-0AA0 SIMATIC Busadapter BA 2XLC	6ES7193-6AG20-0AA0 SIMATIC Busadapter BA LC/RJ45	6ES7193-6AG40-0AA0 SIMATIC Bus adapter BA LC/FC
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm	59 mm
Weights				
Weight, approx.	50 g	40 g	32 g	50 g

Article number	6ES7193-6AS00-0AA0 ET 200SP, Busadapter BA-Send BA1XFC
General information	
Product type designation	BA-Send 1x FC
Interfaces	
Supports protocol for PROFINET IO	
- Cable length	
- Cu conductors	15 m; from IM firmware V3.3: between BA-send and the first ET-CONNECTION bus node and between all other bus nodes
ET-Connection	
• Number of interfaces ET connection	1
• FC (FastConnect)	Yes
Ambient conditions	
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions	
Width	20 mm
Height	69.5 mm
Depth	59 mm
Weights	
Weight, approx.	44 g

Article number	6ES7193-6AG50-0AA0 SIMATIC Busadapter BA 2xLC-LD	6ES7193-6AG60-0AA0 SIMATIC Busadapter BA LC-LD/RJ45	6ES7193-6AG70-0AA0 SIMATIC Busadapter BA LC-LD/M12
General information			
Product type designation	BA 2x LC-LD	BA LC-LD / RJ45	BA LC-LD / M12
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) 2x LC-LD single-mode fiber-optic cable	1; 2 ports (switch) LC-LD / RJ45	1; 2 ports (switch) LC-LD / M12
Supports protocol for PROFINET IO			
• Number of RJ45 ports		1	
• Number of LC ports	2; wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-LX	1; wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-LX	1; wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-LX
• Number of M12 ports			1
- Cable length			
- Cu conductors		100 m	100 m
- single-mode fiber-optic cable 9/125 µm	20 km; 10 km for topology or IRT configuration; min. transmit power -15 dB, min. receiver sensitivity -28 dB	20 km; 10 km for topology or IRT configuration; min. transmit power -15 dB, min. receiver sensitivity -28 dB	20 km; 10 km for topology or IRT configuration; min. transmit power -15 dB, min. receiver sensitivity -28 dB
Ambient conditions			
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual

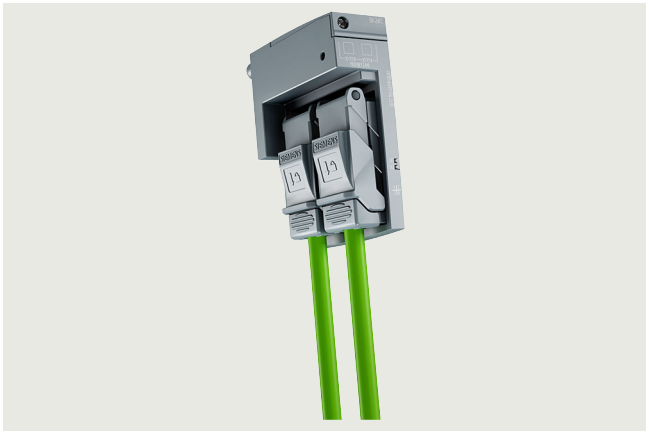
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Technical specifications (continued)

Article number	6ES7193-6AG50-0AA0 SIMATIC Busadapter BA 2xLC-LD	6ES7193-6AG60-0AA0 SIMATIC Busadapter BA LC-LD/RJ45	6ES7193-6AG70-0AA0 SIMATIC Busadapter BA LC-LD/M12
Dimensions			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm
Weights			
Weight, approx.	40 g	32 g	45 g

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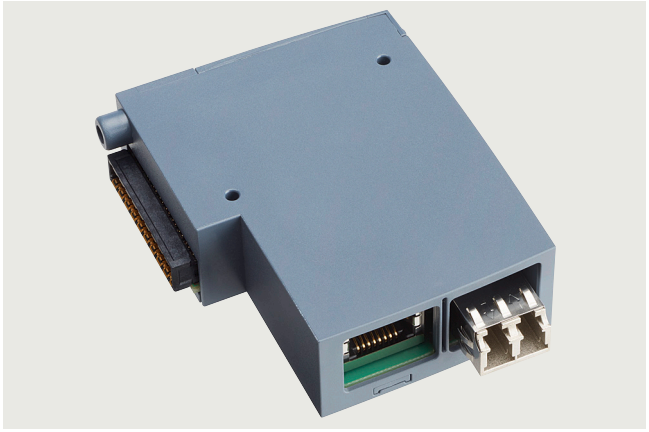
Overview



SIMATIC BA 2xFC BusAdapter for direct laying of the PROFINET cable via FastConnect connection.



SIMATIC BA 2xLC-LD BusAdapter with 2 LC-LD sockets, for use in redundant systems, max. cable length 20 km



SIMATIC BA LC/RJ45 BusAdapter for use as a system-integrated media converter from copper (RJ45) to multimode glass fiber (LC).

Overview (continued)



SIMATIC BA LC-LD/M12 BusAdapter for use as a system-integrated media converter from copper (M12) to single-mode glass fiber (LC-LD).



ET 200SP BA-Send BusAdapter for expansion of an ET 200SP station with ET 200AL modules.

- ET 200SP "BA-Send" BusAdapter
  for expansion of an ET 200SP station with up to 16 modules from the ET 200AL I/O series with IP67 protection via an ET connection.
- SIMATIC BusAdapter
  for the free selection of the connection system (pluggable or direct connection) and physical PROFINET connection (copper, POF, HCS or glass fiber) to devices with a SIMATIC BusAdapter interface. Another advantage of the SIMATIC BusAdapters: only the adapter needs to be replaced for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, or to repair defective RJ45 sockets.

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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Selection and ordering data

SIPLUS BA 2xRJ45 BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN ST, HF	**6AG1193-6AR00-7AA0**
SIPLUS BA 2xFC BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN ST, HF; for increased resistance to vibration and EMC loads	**6AG1193-6AF00-7AA0**
BA 2xM12 BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN ST, HF; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	**6AG1193-6AM00-7AA0**
SIPLUS BA 2xSCRJ BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN HF; fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of attenuation	**6AG1193-6AP00-2AA0**
SIPLUS BA 2xLC BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN HF; 2 glass FO connections	**6AG1193-6AG00-2AA0**
SIPLUS BA LC/RJ45 BusAdapter with conformal coating, media converter glass FO/CU, 1x LC FO connection and 1x RJ45 connection	**6AG1193-6AG20-2AA0**
SIPLUS BA 2xLC-LD BusAdapter With conformal coating, for single-mode optical fiber, up to 20 km	**6AG1193-6AG50-2AA0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	**6AG1193-6AA00-0AA0**
SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS 2xRJ45 BusAdapter	**6AG1193-6AB00-0AA0**

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Technical specifications

Article number	6AG1193-6AM00-7AA0 SIPLUS ET 200SP BA 2xM12	6AG1193-6AP00-2AA0 SIPLUS ET 200SP BA 2XSCRJ PN	6AG1193-6AR00-7AA0 SIPLUS ET 200SP BA 2xRJ45
General information			
Product type designation	BA 2x M12 BusAdapter	BA 2xSCRJ	BusAdapter BA 2x RJ45
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) 2x M12	1; 2 ports (switch) SCRJ FO	1; 2 ports (switch) 2x RJ45
Supports protocol for PROFINET IO			
• Number of RJ45 ports			2
• Number of SCRJ ports		2	
• Number of M12 ports	2		
- Cable length			
- PCF		100 m	
- Plastic FOC (POF)		50 m	
- Cu conductors	100 m		100 m
Ambient conditions			
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
- Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
- Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
- Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)

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Technical specifications (continued)

Article number	6AG1193-6AM00-7AA0 SIPLUS ET 200SP BA 2xM12	6AG1193-6AP00-2AA0 SIPLUS ET 200SP BA 2XSCRJ PN	6AG1193-6AR00-7AA0 SIPLUS ET 200SP BA 2xRJ45
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions			
Width	20 mm	20 mm	20 mm
Height	73.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm
Weights			
Weight, approx.	59 g	50 g	46 g

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Overview



Redundant R1 applications place high demands on

- the mechanical fixation and
- the low-impedance functional grounding connection of the functional grounding

of the individual ET 200SP components. These requirements cannot be ensured with DIN rails according to EN 60715.

For this reason, the use of the specially developed SIMATIC system rail is mandatory for an R1 design of the ET 200SP.

The system rail has

- tight dimensional tolerances for operating conditions under high mechanical load
- long-term stable surface coating for optimum interference suppression
- sturdy design for cantilever construction
- integrated Bosch profile grooves for easy and flexible mounting of modules and accessories (mounting brackets and hinges, damping elements, shield connections, cable ducts, etc.)

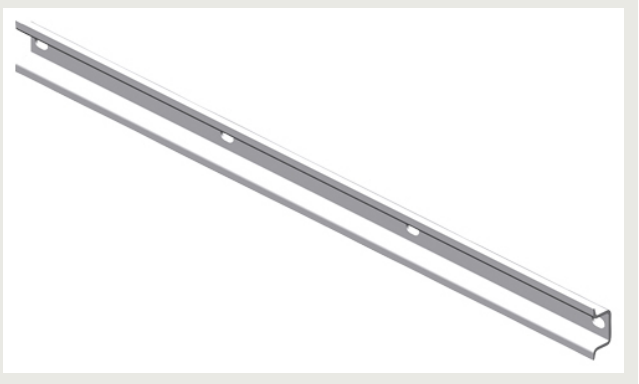
This ensures the high availability of an ET 200SP in R1 operation.

Selection and ordering data

SIMATIC system rail	
with DIN rail according to EN 60715 (35 × 7.5), with 6 mm profile grooves, B-type	
• Length: 482.6 mm for 19" cabinets	**6ES7193-6MR00-0AA0**
• Length: 530 mm for 600 mm cabinets	**6ES7193-6MR00-0BA0**
• Length: 830 mm for 900 mm cabinets	**6ES7193-6MR00-0CA0**
• Length 2 m	**6ES7193-6MR00-0DA0**

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Overview



- 35 mm DIN rails in various lengths
- For accommodating ET 200SP modules

Selection and ordering data

SIMATIC, DIN rail 35 mm Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
SIMATIC, DIN rail 35 mm Length 2 m	**6ES5710-8MA41**

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Overview



The head-end stations and I/O modules can optionally be equipped with labeling strips (13 x 31 mm) for system-specific marking. The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow:

- 500 strips on the roll, for printing on thermal transfer printers. Core diameter 40 mm, external diameter 70 mm, width 62 mm
- 10 DIN A4 sheets with 100 strips each, 180 g/sm card, perforated, for printing using a laser printer direct from TIA Portal or via print templates

Selection and ordering data

Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**

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Overview



Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly:

- The inscription on the front is not covered
- Simple label replacement when replacing a module
- No parallax errors when marking the BaseUnits on the mounting plate

The size of the labels is 14.8 x 10.5 mm (W x H)

Selection and ordering data

Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**

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Overview



The ET 200SP system can be operated with any number of slot gaps (BU slot without inserted I/O module). Applications for this include:

- Partial commissioning
- Prewired but unequipped options

To protect against damage, such slot gaps must be covered by a BU cover.

Within the BU cover, an equipment labeling plate for identification of the I/O module planned for this slot can be stored.

Versions:

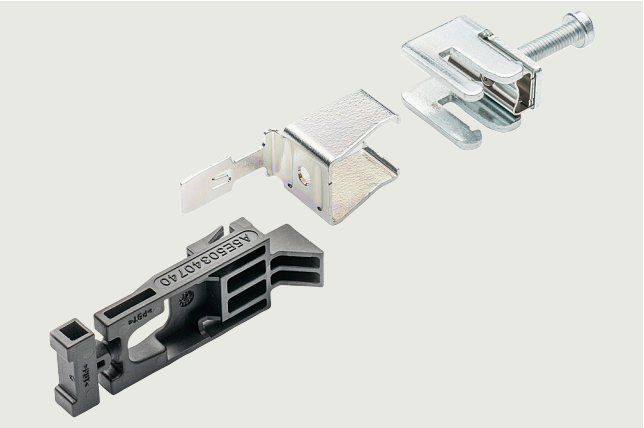
- For BaseUnits with a width of 15 mm (pack containing 5 BU covers)
- For BaseUnits with a width of 20 mm (pack containing 5 BU covers)

Selection and ordering data

BU cover	
for covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**

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Overview



The shield connection permits the low-cost connection of cable shields. Compared to external shield supports, the system offers the following advantages:

- Quick installation without tools by plugging the shield connection element onto the BaseUnit
- Automatic low-impedance connection to the functional grounding (mounting rail)
- Optimized EMC properties by separating the signal lines from the supply voltage lines
- Short unshielded cable lengths
- Requires little space

Selection and ordering data

Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**

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Overview

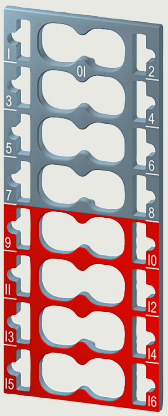
- For PROFINET push-pull plug, e.g. at BA 2xM12 BusAdapter
- Enables unlatching of the plug without disassembly of the BusAdapter

Selection and ordering data

Unlatching strap 10 units, for push-pull PROFINET plug, e. g. when using the BA 2xM12 BusAdapter	**6ES7193-6DL00-2AA0**

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Overview



The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the process terminals. The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals can also be marked using color-coded labels. Advantages of the color-coded labels:

- Quick installation (one label for marking 16 terminals)
- Printed terminal numbers
- Avoidance of wiring errors
- Simple detection of potentials during servicing

Selection and ordering data

Module-specific color-coded labels	
Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)	
• Pack containing 10 labels	**6ES7193-6CP00-2MA0**
• Pack containing 50 labels	**6ES7193-6CP00-4MA0**
Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16), pack containing 10 labels	**6ES7193-6CP01-2MA0**
Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16), pack containing 10 labels	**6ES7193-6CP02-2MA0**
Color code CC03, for 16 push-in terminals, for BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16), pack containing 10 labels	**6ES7193-6CP03-2MA0**
Color code CC04, for 16 push-in terminals, for BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16), pack containing 10 labels	**6ES7193-6CP04-2MA0**
Color code CC05, for 16 push-in terminals, for BU type A0, A1 gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16), pack containing 10 labels	**6ES7193-6CP05-2MA0**
Color code CC41, for 16 push-in terminals; for BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12), pack containing 10 labels	**6ES7193-6CP41-2MB0**
Color code CC42, for 12 push-in terminals, BU type F0, gray (terminals 1 to 8), red (terminals 9 to 10), blue (terminals 11 to 12), pack containing 10 labels	**6ES7193-6CP42-2MB0**
Color code CC51, for 6 push-in terminals, for BU type C0, C1, gray (terminals 1 to 4), red (terminal 5), blue (terminal 6), pack containing 10 labels	**6ES7193-6CP51-2MC0**
Color code CC51, for 6 push-in terminals, for BU type C0, gray (terminals 1, 2 and 5), red (terminals 3 and 4), blue (terminal 6), pack containing 10 labels	**6ES7193-6CP52-2MC0**
Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16), pack containing 50 labels	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16), pack containing 50 labels	**6ES7193-6CP02-4MA0**
Color-coded labels for add-on terminals	
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A), pack containing 10 labels	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A), pack containing 10 labels	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A), pack containing 10 labels	**6ES7193-6CP73-2AA0**
Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C), pack containing 10 labels	**6ES7193-6CP74-2AA0**
Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A), pack containing 10 labels	**6ES7193-6CP81-2AB0**
Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A), pack containing 10 labels	**6ES7193-6CP82-2AB0**
Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A), pack containing 10 labels	**6ES7193-6CP83-2AB0**
Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow-green, for BaseUnit type C0, C1, pack containing 10 labels	**6ES7193-6CP84-2AC0**
Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0, C1, pack containing 10 labels	**6ES7193-6CP85-2AC0**

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Selection and ordering data (continued)

Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0, C1, pack containing 10 labels	**6ES7193-6CP86-2AC0**

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Overview



The server module is included in the scope of delivery of all head-end stations (interface module, CPU, Open Controller). It concludes the setup of an ET 200SP station.

Selection and ordering data

Server module Spare part	**6ES7193-6PA00-0AA0**

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Overview

The SIPLUS server module is included in the scope of supply of all head-end stations (interface module, CPU, Open Controller). It concludes the setup of a SIPLUS ET 200SP station.

Selection and ordering data

SIPLUS server module (Extended temperature range and exposure to environmental substances) Spare part	**6AG1193-6PA00-7AA0**

Technical specifications

Article number	6AG1193-6PA00-7AA0 SIPLUS ET 200SP Servermodul
General information	
Product type designation	Server module
Installation type/mounting	
Mounting	Mounting rail 7.5 mm and 15 mm
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin
• max.	70 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1193-6PA00-7AA0 SIPLUS ET 200SP Servermodul
Dimensions	
Width	7 mm
Height	117 mm
Depth	36 mm
Weights	
Weight, approx.	19 g

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Overview

The Spacing Modules can be used instead of a SIPLUS BaseUnit with BU cover if a blank space is required. For example, empty spaces are required for some modules for operation at 70 °C.

Selection and ordering data

SIPLUS Spacing Module (Extended temperature range and exposure to environmental substances) With conformal coating, no terminals, bridged to the left, WxH: 15 mm x 117 mm	**6AG1193-6BN00-7BA0**
SIPLUS ET 200SP Spacing Module RAIL With conformal coating, -40...+70 °C, no terminals, bridged to the left, WxH: 15 mm x 117 mm	**6AG2193-6BN00-4BA0**

Technical specifications

Article number	6AG1193-6BN00-7BA0 SIPLUS ET 200SP Spacing Module	6AG2193-6BN00-4BA0 SIPLUS ET 200SP Spacing Module RAIL
General information		
Product type designation	spacing module	spacing module
Hardware configuration		
Slots		
• Number of slots	0	0
Standards, approvals, certificates		
Railway application		
• EN 50121-3-2		Yes; EMC for rail vehicles
• EN 50121-4		Yes; EMC for signal and telecommunications systems
• EN 50121-5		Yes; EMC for fixed installations and railway power supply equipment
• EN 50124-1		Yes; railway applications - overvoltage category OV2; pollution degree PD2; UNm = 300 V AC
• EN 50125-1		Yes; Rail vehicles - see ambient conditions
• EN 50125-2		Yes; Stationary electrical equipment - see ambient conditions
• EN 50125-3		Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track)
• EN 50155		Yes; Rail vehicles - temperature class OT4, ST1/ST2, horizontal mounting position
• EN 61373		Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B
• Fire protection acc. to EN 45545-2		Yes; For proof of conformity, see Service & Support
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; +85 °C for 10 min (OT4, ST1/ST2 acc. to EN 50155)
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude		Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request

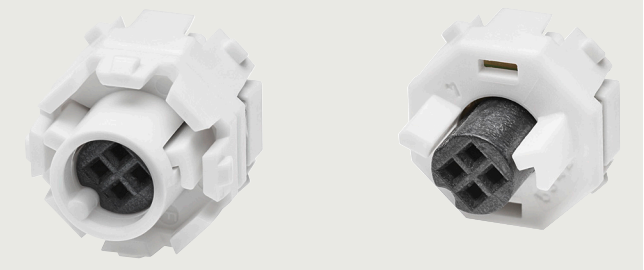
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Technical specifications (continued)

Article number	6AG1193-6BN00-7BA0 SIPLUS ET 200SP Spacing Module	6AG2193-6BN00-4BA0 SIPLUS ET 200SP Spacing Module RAIL
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- Use on land craft, rail vehicles and special-purpose vehicles		
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-5		Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0-AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003		Yes; Level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0-AA0)
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).	
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust	
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Electronic equipment on rolling stock acc. to EN 50155		Yes; class PC2 protective coating acc. to EN 50155
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions		
Width	15 mm	15 mm
Height	117 mm	117 mm
Depth	52 mm	52 mm
Weights		
Weight, approx.	31 g	31 g

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Overview



The operation of selected modules requires an electronic coding element that is always included in the scope of delivery of the I/O module. Apart from the mechanical coding function, this contains a re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules or parameter data in the case of the IO-Link master). In this way, this data is automatically backed up during a module replacement. This saves the user from having to set addresses manually or back up data when replacing modules.

At present, there are two types of electronic coding element:

- e-coding element (Type H), which can be used in the I/O modules:
  - CM IO-Link master
  - F-CM AS-i Safety
- e-coding element (Type F), which can be used in the I/O modules:
  - F-DI 8x24VDC HF
  - F-DQ 4x24VDC/2A PM HF
  - F-PM-E 24VDC/8A PPM ST

Selection and ordering data

Coding elements	
Type H; pack containing 5 electronic coding elements	**6ES7193-6EH00-1AA0**
Type F; pack containing 5 electronic coding elements	**6ES7193-6EF00-1AA0**
Type A; pack with 20 mechanical coding elements, for automatic coding, for I/O modules	**6ES7193-6KA00-3AA0**
Type B; pack with 20 mechanical coding elements, for automatic coding, for I/O modules	**6ES7193-6KB00-3AA0**
Type C; pack with 20 mechanical coding elements, for automatic coding, for I/O modules	**6ES7193-6KC00-3AA0**
Type D; pack with 20 mechanical coding elements, for automatic coding, for I/O modules	**6ES7193-6KD00-3AA0**

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Overview



ET 200SP HA with redundant interface module, standard modules, Ex modules and D-SUB terminal block.

Compact design, flexible connection possibilities and high system availability with redundant PROFINET connections: the SIMATIC ET 200SP HA distributed I/O system is perfectly suited to the requirements of the process industry. The new design allows up to 56 I/O modules per station. An impressively high concentration of up to 32 channels on a module that is only 22.5 mm wide allows for maximum economy in the control cabinet.

Redundant PROFINET connections allow the connection of high-availability controllers via two independent networks, with a choice of copper or fiber-optic cables. The system can be scaled and extended in small steps using a variety of available modules, for example with digital and analog I/Os as well as NAMUR, HART, and other protocols. All 24 V standard signals are connected via an identical terminal block type, which allows a high degree of standardization for the control cabinets.

SIMATIC ET 200SP HA is designed for use in the control cabinet as well as for hazardous areas up to hazardous zone 2. The extended temperature range from -40 to +70 °C and the conformal coating of all components allow direct installation in the field.

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Overview



IM 155-6 PN HA

IM 155-6 PN HA interface module

The IM 155-6 PN HA together with the IM carrier module and the BusAdapter forms the interface of the ET 200SP HA. The interface is used for communication between the CPU and the connected ET 200SP HA I/O modules over PROFINET.

Selection and ordering data

Interface module	
PROFINET IM 155-6 PN interface module Max. 56 I/O modules, multi hot swap, no server module	**6DL1155-6AU00-0PM0**
Accessories	
IM cover Slot cover for interface module slots, to protect vacant slots Width 50 mm, 5 units	**6DL1133-6CV50-0AM0**

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Technical specifications

Article number	6DL1155-6AU00-0PM0 ET 200SP HA, IM155-6 PN
General information	
Product type designation	IM 155-6 PN
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20
• STEP 7 configurable/integrated from version	V5.7.3
• PCS 7 configurable/integrated from version	V10.0 SP1
• PCS neo can be configured/integrated from version	V6.0
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Address area	
Address space per station	
• Address space per station, max.	1 440 byte; 1 440 bytes R1 and S1 without CiR, otherwise 1 000 bytes
Hardware configuration	
Integrated power supply	Yes; 24 V DC
Time stamp	
Accuracy	1 ms; In compliance with the supplementary conditions described in the Equipment Manual
Interfaces	
Number of PROFINET interfaces	1; 2 ports (switch)
1. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes
Protocols	
• PROFINET IO device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; as MRP client
Interface types	
RJ 45 (Ethernet)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes; S2, R1
- Media redundancy	
- MRP	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED

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Technical specifications (continued)

Article number	6DL1155-6AU00-0PM0 ET 200SP HA, IM155-6 PN
• MAINT LED	Yes; Yellow LED
• ACT LED	Yes; green LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Dimensions	
Width	50 mm
Height	138 mm
Depth	89 mm
Weights	
Weight, approx.	192 g; without BusAdapter

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Overview



- DI 16×24VDC HA digital input module
  16 24 V DC digital inputs
- DI 32×24VDC HA digital input module
  32 24 V DC digital inputs
- DI 16×NAMUR HA digital input module
  16 NAMUR digital inputs
- DI 8×24...125VDC HA digital input module
  8 24 ... 125 V DC digital inputs
- DI 8×230VAC HA digital input module
  8 230 V AC digital inputs
- DQ 16×24VDC/0.5A HA digital output module
  16 24 V DC digital outputs, 0.5 A
- DQ 32×24VDC/0.5A HA digital output module
  32 24 V DC digital outputs, 0.5 A
- RQ 4×120VDC-230VAC/5A CO HA digital output module
  4 24 ... 120 V DC, 24 ... 230 V AC relay outputs, 5 A

Selection and ordering data

DI 16×24VDC HA digital input module 16 x 24 V DC digital inputs, color code CC01, for terminal block type H1 and M1, channel diagnostics	**6DL1131-6BH00-0PH1**
DI 16×24VDC NPN HA digital input module 16 x 24 V DC digital inputs, color code CC40, for terminal block type H0, H1, P0, channel diagnostics	**6DL1131-6BH60-0PH1**
DI 32×24VDC HA digital input module 32 x 24 V DC digital inputs, color code CC00, for terminal block type P0 and H1, channel diagnostics	**6DL1131-6BL00-0PH1**
DI 8×24...125VDC HA digital input module 8 x 24 ... 125 V DC digital inputs, color code CC42, for terminal block type K0, channel diagnostics	**6DL1131-6DF00-0PK0**
DI 8×230VAC HA digital input module 8 x 230 V AC digital inputs, color code CC42, for terminal block type K0, module diagnostics	**6DL1131-6GF00-0PK0**
DI 16×NAMUR HA digital input module 16 NAMUR digital inputs, color code CC01, for terminal block type H1 and M1, channel diagnostics	**6DL1131-6TH00-0PH1**
DQ 8x24VDC/2A HA digital output module 8 x 24 V DC digital outputs, 2 A, color code CC01, for terminal block type K0, channel diagnostics	**6DL1132-6BF20-0PK0**
DQ 16×24VDC/0.5A HA digital output module 16 x 24 V DC digital outputs, 0.5 A, color code CC02, for terminal block type H1 and M1, channel diagnostics	**6DL1132-6BH00-0PH1**
DQ 32×24VDC/0.5A HA digital output module 32 x 24 V DC digital outputs, 0.5 A, color code CC00, for terminal block type N0 and H1, channel diagnostics	**6DL1132-6BL00-0PH1**
DQ 8×24...230 V AC/2A HA digital output module 8 x 24 ... 230°V AC digital outputs, color code CC01, for terminal block type K0, channel diagnostics	**6DL1132-6FF00-0PK0**
RQ 4×120VDC-230VAC/5A CO HA digital output module 4 24 ... 120 V DC, 24 ... 230 V AC relay outputs, 5 A, color code CC40, for terminal block type K0, module diagnostics	**6DL1132-6HD50-0PK0**
Accessories	
Labeling strips For labeling the I/O modules	
• Roll, light gray (with a total of 500 labeling strips), 1 unit	**6DL1193-6LR00-0AA0**
• DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)	**6DL1193-6LA00-0AA0**
• DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)	**6DL1193-6LA00-0AG0**
Color-coded labels For push-in terminals	
• Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)	**6DL1193-6CP01-2HH1**
• Color code CC02, 10 units gray (terminals 1 to 16), blue (terminals 17 to 32)	**6DL1193-6CP02-2HH1**
• Color code CC40, 10 units gray (terminals 1 to 16)	**6DL1193-6CP40-2HK0**
• Color code CC42, 10 units gray (terminals 1 to 8), blue (terminals 9 to 16)	**6DL1193-6CP42-2HK0**
Equipment labeling plates 10 sheets with 16 labels each	**6ES7193-6LF30-0AW0**
TM cover Slot cover for I/O modules, to protect vacant I/O slots Width 22.5 mm, 5 units	**6DL1133-6CV22-0AM0**

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Accessories

Slot cover, labeling strips

A slot cover is inserted in a terminal block:

- When slots do not contain I/O modules
- If slots are reserved for future expansion (empty)

You can insert a labeling strip for the planned I/O module in the front of the slot cover. The labeling strips can be ordered as accessories:

- For thermal transfer printers on a roll
- For laser printers as A4 sheets

Color-coding system

Color-coded labels facilitate cable assignment and identification of the potentials of an I/O module. A color code (for example CC01) is printed on each color coding label and I/O module. The color code can be read straight off the I/O module to determine which color-coded label you need for the terminal block.

The reference identification labels in accordance with EN 81346 can be attached to interface modules, BusAdapters and I/O modules. With the standard markings for printing, the reference identification label is suitable for automatic labeling with E-CAD systems.

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Technical specifications

Article number	6DL1131-6BH00-0PH1	6DL1131-6BL00-0PH1	6DL1131-6DF00-0PK0	6DL1131-6GF00-0PK0	6DL1131-6TH00-0PH1
	ET 200SP HA, DI 16X24VDC	ET 200SP HA, DI 32X24VDC	ET 200SP HA, DI 8X24 ... 125VDC	ET 200SP HA, DI 8X230VAC	ET 200SP HA, DI 16XNAMUR
General information					
Product type designation	DI 16x24VDC HA	DI 32x24VDC HA	DI 8x24 ... 125 V DC HA	DI 8x230VAC HA	DI 16xNAMUR HA
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V16	V16	V16	V16	V16
• STEP 7 configurable/integrated from version	V5.6	V5.6	V5.6	V5.6	V5.6
• PCS 7 configurable/integrated from version	V9.0	V9.0	V9.0	V9.0	V9.0
• PCS neo can be configured/integrated from version	V3.0	V3.0	V3.0	V3.0	V3.0
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	No	No	No		No
• Oversampling	No	No	No		
• MSI	No	No	No		
Supply voltage					
Rated value (DC)	24 V	24 V	24 V		24 V
Rated value (AC)				230 V	
Reverse polarity protection	Yes	Yes	Yes		Yes
Encoder supply					
Number of outputs	16	32; When terminal block with encoder supply is used (type P0)			16
Short-circuit protection	Yes; electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable	Yes; When using TB type P0			Yes
Digital inputs					
Number of digital inputs	16	32	8	8; Isolated	16; NAMUR
Digital inputs, parameterizable	Yes	Yes			Yes
Sourcing/sinking input	Yes; P-reading	Yes; P-reading	Yes; P-reading		
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes		
Input characteristic curve in accordance with IEC 61131, type 2	No	No			
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	Yes	
Pulse extension	Yes	No			Yes; 0.5 s, 1 s, 2 s
• Length	off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s				
Time stamp			Yes; Resolution 10 ms	Yes; Resolution 10 ms	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	Yes; Resolution 1ms		Yes; Resolution 1ms	No	No
Edge evaluation	Yes; rising edge, falling edge, edge change	Yes; rising edge, falling edge, edge change			Yes; rising edge, falling edge, edge change
Signal change flutter					Yes; 2 to 32 signal changes

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Technical specifications (continued)

Article number	6DL1131-6BH00-0PH1 ET 200SP HA, DI 16X24VDC	6DL1131-6BL00-0PH1 ET 200SP HA, DI 32X24VDC	6DL1131-6DF00-0PK0 ET 200SP HA, DI 8X24 ... 125VDC	6DL1131-6GF00-0PK0 ET 200SP HA, DI 8X230VAC	6DL1131-6TH00-0PH1 ET 200SP HA, DI 16XNAMUR
Flutter observation window					Yes; 0.5 s, 1 s to 100 s in 1-s steps
Input voltage					
• Rated value (DC)	24 V	24 V			8.2 V
• Rated value (AC)				230 V	
• for signal "0"	-30 to +5 V	-30 to +5 V	-125 ... +5 V	0V AC to 40V AC	
• for signal "1"	+11 to +30V	+11 to +30V	+11 ... +125 V	74 V AC to 264 V AC	
Input current					
• for signal "1", typ.	2.5 mA	2.5 mA	3.1 mA	10.8 mA	
- for 10 k switched contact					
- for signal "0", min.					0.35 mA
- for signal "0", max.					1.2 mA
- for signal "1", min.					2.1 mA
- for signal "1", max.					6.4 mA
- for unswitched contact					
- for signal "0", max. (permissible quiescent current)					0.5 mA
- for signal "1", typ.					8 mA
- for NAMUR encoders					
- for signal "0", min.					0.35 mA
- for signal "0", max.					1.2 mA
- for signal "1", min.					2.1 mA
- for signal "1", max.					6.4 mA
Input delay (for rated value of input voltage)					
• tolerated changeover time for changeover contacts					300 ms
- for standard inputs					
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)		
- for NAMUR inputs					
- at "0" to "1", max.					17 ms
- at "1" to "0", max.					25 ms
Encoder					
Connectable encoders					
• NAMUR encoder/changeover contact according to EN 60947					Yes
• Single contact / changeover contact unconnected					Yes
• Single contact / changeover contact connected with 10 kΩ					Yes
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes; Acc. to NAMUR
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA		1.2 mA
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes			
Alarms					
• Diagnostic alarm	Yes; channel by channel	Yes; channel by channel	Yes	Yes	Yes; channel by channel
• Hardware interrupt	Yes; channel by channel	Yes; channel by channel	Yes; Parameterizable, channels 0 to 7, rising/falling edge		Yes; Parameterizable, channels 0 to 15, rising/falling edge
Diagnoses					
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6DL1131-6BH00-0PH1	6DL1131-6BL00-0PH1	6DL1131-6DF00-0PK0	6DL1131-6GF00-0PK0	6DL1131-6TH00-0PH1
	ET 200SP HA, DI 16X24VDC	ET 200SP HA, DI 32X24VDC	ET 200SP HA, DI 8X24 ... 125VDC	ET 200SP HA, DI 8X230VAC	ET 200SP HA, DI 16XNAMUR
• Monitoring the supply voltage	Yes; module-wise	Yes; module-wise	Yes		Yes
- parameterizable	Yes	Yes			Yes
• Monitoring of encoder power supply	Yes				Yes
• Wire break	Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kOhm to 18 kOhm	Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kOhm to 18 kOhm	Yes; channel by channel		Yes
• Short-circuit		No			Yes
• Short-circuit to ground	Yes; Encoder supply to M, channel by channel				
• Group error			Yes		Yes
• Changeover contact error					Yes
Diagnostics indication LED					
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED		Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	No	Yes; red LED		Yes; red LED
• for module diagnostics	Yes; green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
Dimensions					
Width	22.5 mm	22.5 mm	22.5 mm	22.5 mm	22.5 mm
Height	115 mm	115 mm	115 mm	115 mm	115 mm
Depth	138 mm	138 mm	138 mm	138 mm	138 mm
Weights					
Weight, approx.	135 g	150 g	165 g	148 g	153 g

Article number	6DL1132-6BF20-0PK0	6DL1132-6BH00-0PH1	6DL1132-6BL00-0PH1	6DL1132-6HD50-0PK0
	ET 200SP HA, DQ 8x24VDC/2A HA	ET 200SP HA, DQ 16X24VDC/0,5A	ET 200SP HA, DQ 32X24VDC/0,5A	ET 200SP HA, RQ 4X120VDC-230VAC/5A CO
General information				
Product type designation	DQ 8x24VDC/2A HA	DQ 16x24VDC/0.5A HA	DQ 32x24VDC/0.5A HA	RQ 4x120VDC-230VAC/5A CO HA
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version		V16	V16	V16
• STEP 7 configurable/integrated from version	V5.6.2.10 or higher	V5.6	V5.6	V5.6
• PCS 7 configurable/integrated from version	PCS 7 V10.0.1	V9.0	V9.0	V9.0
• PCS neo can be configured/integrated from version		V3.0	V3.0	V3.0
• PROFINET from GSD version/GSD revision		GSDML V2.3	GSDML V2.3	GSDML V2.3

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Technical specifications (continued)

Article number	6DL1132-6BF20-0PK0 ET 200SP HA, DQ 8x24VDC/2A HA	6DL1132-6BH00-0PH1 ET 200SP HA, DQ 16X24VDC/0,5A	6DL1132-6BL00-0PH1 ET 200SP HA, DQ 32X24VDC/0,5A	6DL1132-6HD50-0PK0 ET 200SP HA, RQ 4X120VDC-230VAC/5A CO
Operating mode				
• DQ	Yes	Yes	Yes	
• DQ with energy-saving function		No	No	
• PWM		No	No	
• Oversampling		No	No	
• MSO		No		
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Digital outputs				
Number of digital outputs	8	16	32	4
Current-sinking	No	No	No	
Current-sourcing	Yes	Yes	Yes	
Digital outputs, parameterizable		Yes	Yes	
Short-circuit protection	Yes; Clocked electronically	Yes; Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable.	Yes; Clocked electronically	
Open-circuit detection	No	Yes; 0.7 mA test current for wire-break diagnostics; this value is doubled in the case of IO redundancy	No	
Overload protection	Yes	Yes	Yes	
Limitation of inductive shutdown voltage to	-27 V	L+ -(37 to 41V)	Typ. L+ (-53 V)	
Controlling a digital input	Yes	Yes	Yes	
Switching capacity of the outputs				
• with resistive load, max.	2 A	0.5 A	0.5 A	
• with inductive load, max.	2 A			
• on lamp load, max.	10 W	5 W	5 W	
Load resistance range				
• lower limit	12 Ω	48 Ω	48 Ω	
• upper limit	4 kΩ	12 kΩ	4 kΩ	
Output current				
• for signal "1" rated value	2 A	0.5 A	0.5 A	
• for signal "0" residual current, max.	0.1 mA	0.7 mA; Test current for wire-break diagnostics; this value is doubled in the case of IO redundancy	0.1 mA	
Output delay with resistive load				
• "0" to "1", typ.	80 µs	50 µs	54 µs	
• "1" to "0", typ.	300 µs	100 µs	48 µs	
Parallel switching of two outputs				
• for uprating	No	No	No	
• for redundant control of a load	No	Yes	Yes; only outputs of the same group	
Switching frequency				
• with resistive load, max.	100 Hz	100 Hz	100 Hz	2 Hz
• with inductive load, max.		2 Hz	2 Hz	0.5 Hz
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.2 Hz			
• on lamp load, max.	10 Hz	10 Hz	10 Hz	2 Hz
Total current of the outputs				

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Technical specifications (continued)

Article number	6DL1132-6BF20-0PK0 ET 200SP HA, DQ 8x24VDC/2A HA	6DL1132-6BH00-0PH1 ET 200SP HA, DQ 16X24VDC/0,5A	6DL1132-6BL00-0PH1 ET 200SP HA, DQ 32X24VDC/0,5A	6DL1132-6HD50-0PK0 ET 200SP HA, RQ 4X120VDC-230VAC/5A CO
• Current per channel, max.	2 A	0.5 A	0.5 A	
• Current per module, max.	10 A	8 A	10 A	
Total current of the outputs (per module)				
- horizontal installation				
- up to 30 °C, max.		8 A		
- up to 40 °C, max.		8 A		
- up to 50 °C, max.		8 A		
- up to 60 °C, max.		5.5 A		
- up to 70 °C, max.	10 A	3 A	10 A	
- vertical installation				
- up to 30 °C, max.		8 A		
- up to 40 °C, max.		6.33 A		
- up to 50 °C, max.		4.67 A		
- up to 60 °C, max.	10 A	3 A	10 A	
Relay outputs				
• Number of relay outputs				4
• external protection for relay outputs				yes; 6 A, see data in manual
- Switching capacity of contacts				
- with inductive load, max.				2 A; 2 A (24 V DC), 0.5 A (60 V DC), 0.1 A (120 V DC)
- with resistive load, max.				5 A; 5 A (30 V DC), 5 A (230 V AC)
- Switching current, min.				8 mA
- Rated switching voltage (DC)				24 V; 24 V DC to 120 V DC
- Rated switching voltage (AC)				230 V; 24V AC to 230V AC
Interrupts/diagnostics/status information				
Diagnostics function		Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
- parameterizable	Yes		Yes	Yes
• Wire break	No	Yes; channel by channel	No	
• Short-circuit			Yes	
• Short-circuit to ground	Yes; channel by channel; valid for clocked operation < 1 Hz	Yes; channel by channel	Yes; channel by channel	
• Short-circuit to L+	No	Yes; channel by channel	No	
• Group error		Yes	Yes	
Diagnostics indication LED				
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	No	
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				

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Technical specifications (continued)

Article number	6DL1132-6BF20-0PK0 ET 200SP HA, DQ 8x24VDC/2A HA	6DL1132-6BH00-0PH1 ET 200SP HA, DQ 16X24VDC/0,5A	6DL1132-6BL00-0PH1 ET 200SP HA, DQ 32X24VDC/0,5A	6DL1132-6HD50-0PK0 ET 200SP HA, RQ 4X120VDC-230VAC/5A CO
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C; No icing
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C; No icing
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude				3 000 m due to converter type used
Dimensions				
Width	22.5 mm	22.5 mm	22.5 mm	22.5 mm
Height	115 mm	115 mm	115 mm	115 mm
Depth	138 mm	138 mm	138 mm	138 mm
Weights				
Weight, approx.	142 g	137 g	150 g	162 g

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Overview



- AI 8×U/I/TC/4×RTD 2-/4-wire HA analog input module
  8 analog inputs
  Measuring range: Voltage: 1 ... 5 V, 0 ... 10 V, ±50 mV, ±80 mV, ±250 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±10 V; current: 4 ... 20 mA (2-/4-wire); und 0 ... 20 mA (4-wire), ±20 mA (4-wire); TC elements: B, C, N, E, R, S, J, L, T, K, U, TXK; RTD elements: Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, LG-Ni1000 | resistance areas: 150, 300, 600, 3000, 6000 Ohm | PTC
- AI 16×I 2-wire HA analog input module
  16 analog inputs
  Measuring range 4 ... 20 mA; 0 ... 10 mA; 0 ... 20 mA
- AI 16×I 2-wire HART HA analog input module
  16 analog inputs
  Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA, 4 to 20 mA with HART
- AI 16×TC/8×RTD 2-/3-/4-wire HA analog input module
  16 analog inputs for thermocouples; alternatively 8 analog inputs for thermistors
- AI 16×I 2-wire HA analog input module
  16 analog inputs
  Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA
- AI 16×I 2-wire HA analog input module
  8 analog inputs for voltage measurements. current measurements, thermocouples, alternatively 4 analog inputs for thermistors
- AQ 8×I HART HA analog output module
  8 analog outputs
  Power output in the output ranges 0 to 10 mA, 0 to 20 mA, 4 to 20 mA and 4 to 20 mA HART
- AI 4XI 2-/4-wire HART ISOL analog input module
  4 galvanically isolated analog inputs (2-/4-wire)
- Analog output module AQ 4XI HART ISOL
  4 galvanically isolated analog outputs (2-wire)

Selection and ordering data

AI 8×U/I/TC/4×RTD 2-/4-wire HA analog input module 8 analog inputs Measuring ranges: • Voltage: 1 ... 5 V, 0 ... 10 V, ±50 mV, ±80 mV, ±250 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±10 V • Current: 4 ... 20 mA (2-/4-wire); und 0 ... 20 mA (4-wire), ±20 mA (4-wire) • TC elements: B, C, N, E, R, S, J, L, T, K, U, TXK • RTD elements: Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, LG-Ni1000 | resistance areas: 150, 300, 600, 3000, 6000 Ohm | PTC Color code CC00, for terminal block type H1, N0 and H0, channel diagnostics, 16-bit	**6DL1134-6AF00-0PH1**
AI 16×I 2-wire HA analog input module 16 analog inputs Measuring range 4 ... 20 mA; 0 ... 10 mA; 0 ... 20 mA Color code CC01, for terminal block type H1 and P1, channel diagnostics, 16-bit	**6DL1134-6GH00-0PH1**
AI 16×I 2-wire HART HA analog input module 16 analog inputs Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA, 4 to 20 mA with HART Color code CC01, for terminal block type H1 and M1, channel diagnostics, 16-bit	**6DL1134-6TH00-0PH1**
AI 16×TC/8×RTD 2-/3-/4-wire HA analog input module 16 analog inputs for thermocouples, alternatively 8 analog inputs for thermistors Color code CC00, for terminal block type H1 and M1, channel diagnostics, 16-bit	**6DL1134-6JH00-0PH1**
AQ 8×I HART HA analog output module 8 analog outputs Power output in the output ranges 0 to 10 mA, 0 to 20 mA, 4 to 20 mA and 4 to 20 mA HART Color code CC00, for terminal block type H1 and M1, channel diagnostics, 16-bit	**6DL1135-6TF00-0PH1**
AI 4XI 2-/4-wire HART ISOL analog input module 14 analog inputs Color code CC01, for terminal block type K0, L0, channel diagnostics, 16-bit, +/-0.1%	**6DL1134-6UD00-0PK0**
Analog output module AQ 4XI HART ISOL 4 analog outputs Color code CC00, for terminal block type K0, L0, channel diagnostics, 16-bit, +/-0.1%	**6DL1135-6UD00-0PK0**
Accessories	
Labeling strips For labeling the I/O modules	
• Roll, light gray (with a total of 500 labeling strips), 1 unit	**6DL1193-6LR00-0AA0**
• DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)	**6DL1193-6LA00-0AA0**
• DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)	**6DL1193-6LA00-0AG0**
Color-coded labels For push-in terminals	
• Color code CC00, 10 units gray (terminals 1 to 32)	**6DL1193-6CP00-2HH1**
• Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)	**6DL1193-6CP01-2HH1**
Equipment labeling plates 10 sheets with 16 labels each	**6ES7193-6LF30-0AW0**
TM cover Slot cover for I/O modules, to protect vacant I/O slots Width 22.5 mm, 5 units	**6DL1133-6CV22-0AM0**

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Technical specifications

Article number	6DL1134-6AF00-0PH1 ET 200SP HA, AI 8xU/I/TC/4xRTD HA	6DL1134-6GH00-0PH1 ET 200SP HA, AI 16xI 2-wire HA	6DL1134-6JH00-0PH1 ET 200SP HA, AI 16XTC/8XRTD 2-/3-/4-WIRE	6DL1134-6TH00-0PH1 ET 200SP HA, AI 16XI 2-WIRE HART	6DL1134-6UD00-0PK0 ET 200SP HA, AI 4XI 2-/4-Wire HART ISOL
General information					
Product type designation	AI 8xU/I/TC/4xRTD 2/3/4-wire HA	AI 16xI 2-wire HA	AI 16 x TC/8 x RTD 2/3/4-wire HA	AI 16 x I 2-wire mA HART	AI 4xI 2-/4-wire HART ISOL HA
Engineering with					
• STEP 7 TIA Portal configurable/integrated from version	V18	V18	V16	V16	V17
• STEP 7 configurable/integrated from version	V5.6	V5.6	V5.6	V5.6	V5.6
• PCS 7 configurable/integrated from version	V9.1 SP2	V9.1 SP2	V9.0	V9.0	V9.1
• PCS neo can be configured/integrated from version	V4.0	V4.0	V3.0	V3.0	V3.0
• PROFINET from GSD version/GSD revision	GSDML V2.42 2023.01	GSDML V2.42 2023.01	GSDML V2.3	GSDML V2.3	GSDML V2.35
Operating mode					
• Oversampling		No			
• MSI		No			
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Encoder supply					
Number of outputs		16			4
Short-circuit protection		Yes			Yes; Electronic
Analog inputs					
Number of analog inputs		16		16	4
• For current measurement	8	16			4
• For voltage measurement	8		16		
• For resistance/resistance thermometer measurement	4		8		
• For thermocouple measurement	8		16		
permissible input voltage for voltage input (destruction limit), max.	24 V		5 V		
permissible input current for current input (destruction limit), max.	40 mA	30 mA		30 mA	30 mA
Constant measurement current for resistance-type transmitter, typ.	1.25 mA		2 mA		
Cycle time (all channels), min.		400 ms			
Technical unit for temperature measurement adjustable	Yes; °C/°F/K		Yes; °C/°F/K		
Input ranges (rated values), voltages					
• 0 to +10 V	Yes; 15 bit				
• 1 V to 5 V	Yes; 15 bit				
• -1 V to +1 V	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• -10 V to +10 V	Yes; 16 bit incl. sign				
• -2.5 V to +2.5 V	Yes; 16 bit incl. sign				
• -250 mV to +250 mV	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• -5 V to +5 V	Yes; 16 bit incl. sign				
• -50 mV to +50 mV	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• -500 mV to +500 mV	Yes; 16 bit incl. sign				
• -80 mV to +80 mV	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
Input ranges (rated values), currents					
• 0 to 20 mA	Yes	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -20 mA to +20 mA	Yes				

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Technical specifications (continued)

Article number	6DL1134-6AF00-0PH1 ET 200SP HA, AI 8xU/I/TC/4xRTD HA	6DL1134-6GH00-0PH1 ET 200SP HA, AI 16xI 2-wire HA	6DL1134-6JH00-0PH1 ET 200SP HA, AI 16XTC/8XRTD 2-/3-/4-WIRE	6DL1134-6TH00-0PH1 ET 200SP HA, AI 16XI 2-WIRE HART	6DL1134-6UD00-0PK0 ET 200SP HA, AI 4XI 2-/4-Wire HART ISOL
• 4 mA to 20 mA	Yes	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), thermocouples					
• type B	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• type C	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type E	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type J	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type K	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type L	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type N	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type R	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type S	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type T	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type U	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
Input ranges (rated values), resistance thermometer					
• Cu 10	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Cu 50	Yes; 16 bit incl. sign				
• Cu 100	Yes; 16 bit incl. sign				
• Ni 100	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Ni 1000	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• LG-Ni 1000	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Ni 120	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Ni 200	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Ni 500	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Pt 100	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Pt 1000	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Pt 200	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
• Pt 500	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign		
Input ranges (rated values), resistors					
• 0 to 150 ohms	Yes; 15 bit		Yes; 15 bit		
• 0 to 300 ohms	Yes; 15 bit		Yes; 15 bit		
• 0 to 600 ohms	Yes; 15 bit		Yes; 15 bit		
• 0 to 3000 ohms	Yes; 15 bit		Yes; 15 bit		
• 0 to 6000 ohms	Yes; 15 bit		Yes; 15 bit		
• PTC	Yes; 15 bit		Yes; 15 bit		
Thermocouple (TC)					
- Temperature compensation					
- Parameterizable	Yes		Yes		
Cable length					
• shielded, max.	thermocouples: shielded cable length max. 200 m, voltages: shielded cable length max. 600 m, loop resistance max 8 kOhm; measuring ranges RTD: shielded cable length max. 600 m, cable resistance (single) max. 75 ohm, current measurement: shielded cable length max. 800 m	800 m	200 m; Measurement ranges for thermocouples / voltages: shielded cable length max. 600 m, loop resistance max 8 kOhm; measuring ranges RTD: shielded cable length max. 600 m, cable resistance (single) max. 75 ohms	800 m; with unshielded cables up to 800 m, remember that (external) EMC loads can cause incorrect measured values	800 m; with unshielded cables up to 800 m, remember that (external) EMC loads can cause incorrect measured values

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Technical specifications (continued)

Article number	6DL1134-6AF00-0PH1 ET 200SP HA, AI 8xU/I/TC/4xRTD HA	6DL1134-6GH00-0PH1 ET 200SP HA, AI 16xI 2-wire HA	6DL1134-6JH00-0PH1 ET 200SP HA, AI 16XTC/8XRTD 2-/3-/4-WIRE	6DL1134-6TH00-0PH1 ET 200SP HA, AI 16XI 2-WIRE HART	6DL1134-6UD00-0PK0 ET 200SP HA, AI 4XI 2-/4-Wire HART ISOL
• unshielded, max.	200 m; Only applies when connecting current sensors	200 m			
Analog value generation for the inputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit; 15 bit at 0 ... 10 mA and 60 Hz interference suppression	16 bit	16 bit; 15 bit at 0 ... 10 mA and 60 Hz interference suppression	16 bit; 14 bit at 60 Hz (0 ... 10 mA), 16 bit at 10 Hz, 15 bit at 50 Hz and 15 bit at 60 Hz interference suppression
• Integration time, parameterizable	Yes; Channel-by-channel, results from the selected interference frequency suppression	Yes; channel by channel	Yes; Channel-by-channel, results from the selected interference frequency suppression	Yes; channel by channel	
• Integration time (ms)		16.6 / 20 / 100 ms			
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 / 400 Hz		16.6 / 50 / 60 Hz, channel-by-channel		
• Conversion time (per channel)	Channel-by-channel, results from the selected interference frequency suppression		60 ms; 180 / 50 ms, results from the selected interference frequency suppression		
Smoothing of measured values					
• Parameterizable	Yes; none, weak, medium, strong, channel-by-channel	Yes; none, weak, medium, strong, channel-by-channel	Yes; none, weak, medium, strong, channel-by-channel	Yes; none, weak, medium, strong, channel-by-channel	Yes; none, weak, medium, strong, channel-by-channel
Encoder					
Connection of signal encoders					
• for voltage measurement	Yes				
• for current measurement as 2-wire transducer	Yes	Yes		Yes	Yes
- Burden of 2-wire transmitter, max.	820 Ω				
• for current measurement as 4-wire transducer	Yes				
• for resistance measurement with two-wire connection	Yes; all measuring ranges incl. PTC				
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances				
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC				
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)	0.1 %		0.05 %		
• Current, relative to input range, (+/-)	0.1 %	0.3 %		0.1 %	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %		0.05 %		
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency					
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB		70 dB		
• Common mode voltage, max.	15 V		60 V		
• Common mode interference, min.	90 dB		90 dB		

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Technical specifications (continued)

Article number	6DL1134-6AF00-0PH1 ET 200SP HA, AI 8xU/I/TC/4xRTD HA	6DL1134-6GH00-0PH1 ET 200SP HA, AI 16xI 2-wire HA	6DL1134-6JH00-0PH1 ET 200SP HA, AI 16XTC/8XRTD 2-/3-/4-WIRE	6DL1134-6TH00-0PH1 ET 200SP HA, AI 16XI 2-WIRE HART	6DL1134-6UD00-0PK0 ET 200SP HA, AI 4XI 2-/4-Wire HART ISOL
Interrupts/diagnostics/status information					
Diagnostics function	Yes		Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	No	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire break	Yes; channel-by-channel current 4 ... 20 mA, R and RTD	Yes; channel-by-channel, at 4 to 20 mA only	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel for current (2-wire)	No		Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply
• Overflow/Underflow	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED					
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes; 125 V AC / 150 V DC (when using terminal blocks with push-in terminals); SELV/PELV (when using terminal blocks with D-SUB)
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C; Observe derating	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C; Observe derating	70 °C
Dimensions					
Width	22.5 mm	22.5 mm	22.5 mm	22.5 mm	22.5 mm
Height	115 mm	115 mm	115 mm	115 mm	115 mm
Depth	138 mm	138 mm	138 mm	138 mm	138 mm
Weights					
Weight, approx.	150 g	148 g	150 g	148 g	163 g

Article number	6DL1135-6TF00-0PH1 ET 200SP HA, AQ 8XI HART	6DL1135-6UD00-0PK0 ET 200SP HA, AQ 4XI HART ISOL
General information		
Product type designation	AQ 8 x I HART HA	AQ 4xI HART ISOL HA
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V16	V17
• STEP 7 configurable/integrated from version	V5.6	V5.6
• PCS 7 configurable/integrated from version	V9.0	V9.1

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Technical specifications (continued)

Article number	6DL1135-6TF00-0PH1 ET 200SP HA, AQ 8XI HART	6DL1135-6UD00-0PK0 ET 200SP HA, AQ 4XI HART ISOL
• PCS neo can be configured/integrated from version	V3.0	V3.0
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.35
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Analog outputs		
Number of analog outputs	8; short-circuit proof with respect to ground	4
Output ranges, current		
• 0 to 10 mA	Yes; 14 bit	
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	No	
• 4 mA to 20 mA	Yes; 16 bit incl. sign	Yes; 15 bit
Connection of actuators		
• for current output two-wire connection	Yes	Yes
Load impedance (in rated range of output)		
• for current outputs, min.	150 Ω	50 Ω
• with current outputs, max.	750 Ω	750 Ω
• with current outputs, inductive load, max.	10 mH	10 mH
Cable length		
• shielded, max.	1 000 m; with unshielded cables up to 800 m, remember that (external) EMC loads can cause incorrect measured values	1 000 m; with unshielded cables up to 800 m, remember that (external) EMC loads can cause incorrect measured values
Analog value generation for the outputs		
Settling time		
• for resistive load	1.2 ms; 750 ohm	1.2 ms; 750 ohm
• for inductive load	1.2 ms	1.2 ms
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Current, relative to output range, (+/-)	0.1 %	0.1 %
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel	Yes
• Overflow/Underflow	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes; 125 V AC / 150 V DC (when using terminal blocks with push-in terminals); SELV/PELV (when using terminal blocks with D-SUB)
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C; Observe derating
• vertical installation, min.	-40 °C	-40 °C

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Technical specifications (continued)

Article number	6DL1135-6TF00-0PH1 ET 200SP HA, AQ 8XI HART	6DL1135-6UD00-0PK0 ET 200SP HA, AQ 4XI HART ISOL
• vertical installation, max.	60 °C	60 °C; Observe derating
Dimensions		
Width	22.5 mm	22.5 mm
Height	115 mm	115 mm
Depth	138 mm	138 mm
Weights		
Weight, approx.	160 g	165 g

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Overview



The I/O module AI-DI 16/DQ16×24VDC HART HA is available in the following versions:

- DI 16/DQ16x24VDC HA in digital-only mode
- AI-DI 16/DQ 16x24VDC HART HA as digital/analog module in mixed mode

Time stamping is available with configuration in mixed mode. High-precision time stamping (SoE: Sequence of Events) with a precision of 1 ms is available with configuration in digital-only mode.

In mixed mode, the 16 inputs can also be set channel by channel as either digital inputs or analog inputs with or without HART. HART is only available in mixed mode and with configuration in a measuring range of 4 to 20 mA.

Selection and ordering data

AI-DI 16/DQ16×24VDC HART HA input/output module 16 channels, each with digital output and digital/analog input Color code CC01, for terminal block type H1 and M1	**6DL1133-6EW00-0PH1**
Accessories	
Labeling strips For labeling the I/O modules	
• Roll, light gray (with a total of 500 labeling strips), 1 unit	**6DL1193-6LR00-0AA0**
• DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)	**6DL1193-6LA00-0AA0**
• DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)	**6DL1193-6LA00-0AG0**
Color-coded labels For push-in terminals	
• Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)	**6DL1193-6CP01-2HH1**
Equipment labeling plates 10 sheets with 16 labels each	**6ES7193-6LF30-0AW0**
Slot cover for I/O modules 22.5 mm wide	**6DL1133-6CV22-0AM0**

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Technical specifications

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
General information	
Product type designation	AI-DI 16/DQ 16x24VDC HART HA
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V16
• STEP 7 configurable/integrated from version	V5.6
• PCS 7 configurable/integrated from version	V9.0
• PCS neo can be configured/integrated from version	V3.0
• PROFINET from GSD version/GSD revision	GSDML V2.3
Operating mode	
• DI	Yes
• Counter	Yes
• DQ	Yes
• DQ with energy-saving function	No
• PWM	No
• Oversampling	No
• MSI	No
• MSO	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	16
Short-circuit protection	Yes; per channel, electronic
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Pulse extension	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Time stamp	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	Yes; Resolution 1ms
Digital input functions, parameterizable	
• Gate start/stop	Yes; Partner channel of n+8 counter
• Freely usable digital input	Yes; Parameterizable input filter
• Counter	Yes; Incl. frequency measurement
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
Digital outputs	
Number of digital outputs	16
Current-sinking	No
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; Response threshold 0.7 A to 1.3 A
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)

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Technical specifications (continued)

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.7 mA
Output delay with resistive load	
• "0" to "1", typ.	50 µs
• "1" to "0", typ.	100 µs
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	0.5 A
• Current per module, max.	2 A
Analog inputs	
Number of analog inputs	16
permissible input current for current input (destruction limit), max.	30 mA
Input ranges (rated values), currents	
• 0 to 10 mA	Yes
• 0 to 20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 16 bit incl. sign
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; Resolution with overrange (bit including sign), max. 16 bits, exception: 15 bits at 60 Hz interference suppression and 0 to 10 mA
• Integration time, parameterizable	Yes; channel by channel
Smoothing of measured values	
• Parameterizable	Yes; none, weak, medium, strong, channel-by-channel
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
• Hardware interrupt	Yes; Parameterizable, channels 0 to 15, rising/falling edge
Diagnoses	

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Technical specifications (continued)

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
• Monitoring the supply voltage	Yes
• Wire break	Yes; channel by channel
• Short-circuit to ground	Yes; Encoder supply to M, channel by channel
• Group error	Yes
• Overflow/Underflow	Yes; channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	No
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Frequency measurement	Yes
• Number of frequency meters	8
Counting functions	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes; Via partner channel (digital input n+8)
• Software gate	Yes
Measuring functions	
• Dynamic measurement period adjustment	Yes
- Measuring range	
- Frequency measurement, min.	0.1 Hz
- Frequency measurement, max.	5 kHz
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C; Observe derating
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C; Observe derating
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	150 g

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Overview

ET 200SP HA Fast Multi IO & Counter



- Analog/digital module, input/output, counter, speed measurement
- 8 analog outputs (up to 800 Hz)
  Measuring range: 4x 0/4-20 mA, ±20 mA, ±50 mA and 4x ±10 V
- 4 analog inputs
  Measuring ranges: 0/4-20 mA, ±20 mA, ±30 mA, ±10 V, 0-20 V, -20-0 V
- Sensor supply: ±50 mA via digital output
- 4 digital inputs 24 V
- 3 counters up to 70 kHz
  Counter functions: up/down, once/periodic, gate control, 32-bit
- 6 combined digital inputs and outputs (DI/DQ)

ET 200SP HA vibration protection



Overview (continued)

- Analog/digital module, input/output, vibration protection
- Vibration protection for rotating machinery (e.g. drives, compressors, gears, fans)
- 4 analog inputs (up to 50 kHz signal frequency)
  Measuring ranges: 0/4-20 mA, ±20 mA, ±30 mA, ±10 V, 0-20 V, -20-0 V
  Suitable for electrodynamic and piezoelectric vibration sensors
- Sensor supply: ±50 mA
- Integrated signal processing:
  10 configurable function sequences for calculation of vibration-specific performance characteristics (simultaneous use 8 function sequences per module)
- 4 analog inputs
  Measuring ranges: 0/4-20 mA, ±20 mA, ±30 mA, ±10 V, 0-20 V, -20-0 V
- 8 analog outputs (up to 800 Hz)
  Measuring range: 4x 0/4-20 mA, ±20 mA, ±50 mA and 4x ±10 V
- Sensor supply: ±50 mA via digital output
- 4 digital inputs 24 V
- 6 combined digital inputs and outputs (DI/DQ)

Selection and ordering data

ET 200SP HA TM Fast Multi IO & Counter 4xAI, 8xAQ, 4xDI, 6xDI/DQ Color code CC00, terminal block type H1 and M1	**6DL1138-6EA00-0EH1**
ET 200SP HA vibration protection 4xAI, 8xAQ, 4xDI, 6xDI/DQ Color code CC00, terminal block type H1 and M1	**6DL1138-6EC00-0EH1**

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Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA Vibration Protection
General information		
Product type designation	Fast Multi IO & Counter	Vibration protection module 4 channels
Product function		
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V18	
• STEP 7 configurable/integrated from version	V5.6 with HSP 298 or higher	V5.6 with HSP 298 or higher
• PCS 7 configurable/integrated from version	V9.1 SP1	V9.1 SP1
• SPPA-T3000 can be configured/integrated from version	V8.2 SP2	V8.2 SP2
Operating mode		
• DI	Yes	Yes
• Counter	Yes	
• DQ	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Encoder supply		
Number of outputs	6; max. depending on parameterization	6; max. depending on parameterization
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Digital inputs		
Number of digital inputs	10; Of these, 6 combined DI/DQ	10; Of these, 6 combined DI/DQ
Digital inputs, parameterizable	Yes	Yes
Sourcing/sinking input	Yes; DI0 ... DI3 (param.); sinking DIDQ4 ... DIDQ9	Yes; DI0 ... DI3 (param.); sinking DIDQ4 ... DIDQ9
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Pulse extension	Yes	Yes
• Length	2 s; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	2 s; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Digital input functions, parameterizable		
• Gate start/stop	Yes; Selectable: Standard DI, encoder signals A, B, N, gate start, gate stop, set counter	
• Freely usable digital input	Yes	
• Counter	Yes	
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	0 ... 5 V	0 ... 5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.6 mA; 2.6 mA DI, 3.5 mA DIDQ	2.6 mA; 2.6 mA DI, 3.5 mA DIDQ
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
- for technological functions		
- Parameterizable	Yes; Adjustable filter: 5 µs, 25 µs	
Digital outputs		
Number of digital outputs	6; max. depending on parameterization	6; max. depending on parameterization
Current-sinking	No	No
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes	Yes
Overload protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)	L+ -(37 to 41V)
Controlling a digital input	Yes	Yes
Digital output functions, parameterizable		

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Technical specifications (continued)

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA Vibration Protection
• Switching tripped by comparison values	Yes; As output signal of a high-speed counter	
• Freely usable digital output	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A
Load resistance range		
• lower limit	48 Ω	48 Ω
Output voltage		
• for signal "1", min.	18.1 V	18.1 V
Output current		
• for signal "1" rated value	0.5 A	0.5 A
Output delay with resistive load		
• "0" to "1", typ.	1 ms	1 ms
• "1" to "0", typ.	100 µs	100 µs
Parallel switching of two outputs		
• for logic links	No	
• for uprating	No	
• for redundant control of a load	Yes	
Switching frequency		
• with resistive load, max.	800 Hz	800 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A	0.5 A
• Current per module, max.	2 A	2 A
Analog inputs		
Number of analog inputs	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V
permissible input current for current input (destruction limit), max.	50 mA; Protection available against destruction	50 mA; Protection available against destruction
Cycle time (all channels), min.		1.25 ms; For up to 128 samples per channel
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -10 V to +10 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA	Yes; 0 mA or 4 mA to 20 mA
• -20 mA to +20 mA	Yes	Yes
• 4 mA to 20 mA	Yes; and 0 to 20 mA	Yes; and 0 to 20 mA
Cable length		
• shielded, max.	600 m	600 m
Analog outputs		
Number of analog outputs	8; 4 AQ-I, 4 AQ-U	8; 4 AQ-I, 4 AQ-U
Cycle time (all channels), min.		625 µs
Output ranges, voltage		
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
• -20 mA to +20 mA	Yes; ±30 mA, ±50 mA	Yes; ±30 mA, ±50 mA
• 4 mA to 20 mA	Yes	Yes
Connection of actuators		
• for voltage output two-wire connection	Yes	Yes
Load impedance (in rated range of output)		
• with current outputs, max.	330 Ω; 150 ohms at ±50 mA	330 Ω; 150 ohms at ±50 mA
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	24 bit	24 bit
Smoothing of measured values		
• Parameterizable	Yes	Yes

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Technical specifications (continued)

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA Vibration Protection
Analog value generation for the outputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes
• for current measurement as 4-wire transducer		Yes
Connectable encoders		
• Single contact / changeover contact unconnected	Yes	Yes
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes; AI 4 ... 20 mA, AQ, DQ, DI 0 ... 3	Yes; AI 4 ... 20 mA, AQ, DQ, DI 0 ... 3
• Short-circuit to ground	Yes; Encoder supply to M, channel by channel	Yes; Encoder supply to M, channel by channel
• Short-circuit to L+	Yes; Analog inputs	Yes; Analog inputs
• Group error	Yes	Yes
• Overflow/Underflow	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Integrated Functions		
Frequency measurement	Yes; Speed measurement	
Counting functions		
• Continuous counting	Yes	
• Counter response parameterizable	Yes	
• Hardware gate via digital input	Yes	
• Software gate	Yes	
Measuring functions		
• Dynamic measurement period adjustment	Yes; Speed measurement	
- Measuring range		
- Frequency measurement, min.	0.1 Hz	
- Frequency measurement, max.	70 kHz; 70 kHz for DI; 7 kHz for DI/DQ; each for P/M encoder and 50 m cable length; 10 kHz for DI; 0.7 kHz for DI/DQ; each for P encoder and 50 m cable length	
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C; Observe derating	70 °C; Observe derating
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	3 500 m	3 500 m

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Technical specifications (continued)

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA Vibration Protection
Dimensions		
Width	22.5 mm	22.5 mm
Height	115 mm	115 mm
Depth	138 mm	138 mm
Weights		
Weight, approx.	200 g	200 g

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Overview



Fail-safe I/O modules permit safety-oriented monitoring and thus, when required, bringing the plant to the defined safe state. The communication and integration into the process control system is enabled with the proven technology SIMATIC Safety Integrated. The fail-safe I/O modules for DI, DQ and AI correspond to the size of the standard modules and are certified by the German Technical Inspectorate up to SIL 3 per channel. All fail-safe I/O modules can be set up in redundant configuration guaranteeing not only fail-safe operation but also highest availability. SIMATIC ET 200SP HA is perfectly adapted for demanding fail-safe and standard applications in the manufacturing and process industries when high availability and PROFINET R1 redundancy are imperative.

- www.siemens.com/process-safety

Selection and ordering data

F-DI 16×24VDC HA digital input module 16 digital inputs 24 V DC, color code CC01, for terminal block type H1 and M1, channel diagnostics	**6DL1136-6BA00-0PH1**
F-DQ 10×24VDC/2A HA digital output module 10 digital outputs 24 V DC, 2 A, color code CC01, for terminal block type H1 and M1, channel diagnostics	**6DL1136-6DA00-0PH1**
F-AI 8×I 2-/4-wire HART HA analog input module 8 digital inputs, color code CC00, for terminal block type H1 and F1, channel diagnostics	**6DL1136-6AA00-0PH1**
F-DI 16×NAMUR HA digital input module 16 digital inputs, color code CC01, for terminal block type H0 and H1, channel diagnostics	**6DL1136-6TH00-0PH1**

Note:

The use of fail-safe modules requires SIMATIC S7 F systems.

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Technical specifications

Article number	6DL1136-6AA00-0PH1 ET 200SP HA, F-AI 8xI 2-/4-wire HART HA
General information	
Product type designation	F-AI 8xI 2-/4-wire HART HA
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V21
• STEP 7 configurable/integrated from version	V5.6 SP2 (with S7 F Systems V6.4)
• PCS 7 configurable/integrated from version	V9.0 SP3 + UC04 (with F Systems V6.4)
• PROFINET from GSD version/GSD revision	GSDML V2.42 2023.01
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
Short-circuit protection	Yes
Analog inputs	
Number of analog inputs	
• For current measurement	8
permissible input current for current input (destruction limit), max.	35 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
HART communication	
• Primary Master	Yes
• Secondary Master	No
• input resistance (with HART communication)	150 Ω; for operation with an external secondary master (e.g. communicator), an external load may be necessary to achieve a total impedance of 230 - 600 Ω.
Cable length	
• shielded, max.	1 000 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	20 ms (at 50 Hz); 16.66 ms (at 60 Hz)
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
Smoothing of measured values	
• Parameterizable	Yes; in 4 stages (1, 4, 16, 64 conversion cycles), channel-by-channel
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
safety-relevant accuracy	
• up to 40 °C, max.	0.6 %; (0.7% in vertical installation)
• up to 70 °C, max.	0.9 %
Influence of a HART signal modulated on the input signal in relation to input range	
• error at 16.6 ms integration time	0.11 %
• error at 20 ms integration time	0.11 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode voltage, max.	35 V
• Common mode interference, min.	80 dB
Protocols	
HART protocol	Yes
• Protocol version	up to Revision 7

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Technical specifications (continued)

Article number	6DL1136-6AA00-0PH1 ET 200SP HA, F-AI 8xI 2-/4-wire HART HA
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short-circuit	Yes
• Overflow/Underflow	Yes
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLd (PLe for 1oo2 voting on the F-CPU)
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	220 g

Article number	6DL1136-6BA00-0PH1 ET 200SP HA, F-DI 16X24VDC	6DL1136-6TH00-0PH1 ET 200SP HA,F-DI 16xNAMUR HA
General information		
Product type designation	F-DI 16x24VDC HA	F-DI 16xNAMUR HA
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V21	
• STEP 7 configurable/integrated from version	V5.6 SP2 V9.0 SP3 (with S7 F Systems V6.3)	V5.6 SP2 (with S7 F systems V6.4 SP1)
• PCS 7 configurable/integrated from version	V9.0 SP3 (with S7 F Systems V6.3)	V9.1 SP2 (with S7 F systems V6.4 SP1)
• PROFINET from GSD version/GSD revision	GSDML V2.42 2023.01	GSDML V2.43 2024.10 (PRONETA)
Operating mode		
• DI	Yes	Yes
• Counter		No
• Oversampling		No
• MSI		No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Encoder supply		
Number of outputs	16	16
Short-circuit protection		Yes

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Technical specifications (continued)

Article number	6DL1136-6BA00-0PH1 ET 200SP HA, F-DI 16X24VDC	6DL1136-6TH00-0PH1 ET 200SP HA,F-DI 16xNAMUR HA
Digital inputs		
Number of digital inputs	16	16
Digital inputs, parameterizable	Yes	Yes
Sourcing/sinking input	Yes; P-reading	
Input characteristic curve in accordance with IEC 61131, type 1	Yes	
Input characteristic curve in accordance with IEC 61131, type 2	No	
Input characteristic curve in accordance with IEC 61131, type 3	No	
Pulse extension	Yes	Yes
• Length	off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	0 / 0.5 / 1 / 2 s
Time stamp	Yes; Resolution 10 ms	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)		No
Signal change flutter	Yes	Yes; 2 to 32 signal changes
Flutter observation window	Yes	Yes; 0.5 s, 1 s to 100 s in 1-s steps
Input voltage		
• Rated value (DC)	24 V	8.2 V
• for signal "0"	-30 to +5 V	
• for signal "1"	+15 to +30 V	
Input current		
• for signal "1", typ.	2.5 mA	4.2 mA
- for NAMUR encoders		
- for signal "0", max.		1.2 mA; according to IEC 60947-5-6 and NAMUR
- for signal "1", min.		2.1 mA; according to IEC 60947-5-6 and NAMUR
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes	
Encoder		
Connectable encoders		
• NAMUR encoder/changeover contact according to EN 60947		Yes
• 2-wire sensor	Yes	Yes; Acc. to NAMUR
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.2 mA
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes; channel by channel
• Maintenance interrupt	Yes	Yes; module-wise
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; module-wise	Yes; module-wise
- parameterizable	Yes	
• Monitoring of encoder power supply	Yes; channel by channel	Yes; channel by channel
• Wire break	Yes; channel by channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 18 kOhm to 30 kOhm, typical 26 kOhm	Yes; I < 0.35 mA
• Short-circuit		Yes; 100 ... 360 ohm
• Short-circuit to ground	Yes; Encoder supply to M, channel by channel	
Diagnostics indication LED		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
Potential separation		
Potential separation channels		

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Technical specifications (continued)

Article number	6DL1136-6BA00-0PH1 ET 200SP HA, F-DI 16X24VDC	6DL1136-6TH00-0PH1 ET 200SP HA,F-DI 16xNAMUR HA
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	Up to PLe	Up to PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Dimensions		
Width	22.5 mm	22.5 mm
Height	115 mm	115 mm
Depth	138 mm	138 mm
Weights		
Weight, approx.	210 g	205 g

Article number	6DL1136-6DA00-0PH1 ET 200SP HA, F-DQ 10X24VDC/2A
General information	
Product type designation	F-DQ 10X24VDC/2A PP HA
Engineering with	
• STEP 7 configurable/integrated from version	V5.6 SP2 V9.0 SP3 (with S7 F Systems V6.3)
• PCS 7 configurable/integrated from version	V9.0 SP3 (with S7 F Systems V6.3)
• PROFINET from GSD version/GSD revision	GSDML V2.42 2023.01
Operating mode	
• DQ	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital outputs	
Type of digital output	PP-switching
Number of digital outputs	10
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Switching capacity of the outputs	
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	2 000 Ω
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	20 Hz
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.1 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	10 A
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	

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Technical specifications (continued)

Article number	6DL1136-6DA00-0PH1 ET 200SP HA, F-DQ 10X24VDC/2A
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; module-wise
• Wire break	Yes; channel by channel
• Short-circuit to ground	Yes; channel by channel
• Short-circuit to L+	Yes; channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; Yellow MT LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Up to PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	230 g

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Overview



ET200SP_Ex_IO_withPM

The intrinsically safe ET 200SP HA Ex I/O modules extend the SIMATIC ET 200SP HA and SIMATIC ET 200SP distributed I/O systems with the option of integrating devices located in hazardous areas (intrinsically safe sensors, actuators and HART field devices) into the system.

The ET 200SP HA Ex I/O modules with device protection according to intrinsic safety "i" offer channel outputs in Zone 0 or 1. 2-channel HART analog input and output modules and 2/4-channel digital input and output modules with different characteristic curves as well as a power module for intrinsically safe power supply of the modules.

Separate Ex isolators with correspondingly complex wiring and high space requirements are no longer required. The I/O modules can be installed up to ATEX Zone 2 and offer intrinsically safe circuits in Ex ia design for field devices up to Zone 0.

The Ex modules offer channel diagnostics and Configuration in Run and are approved for ambient temperatures from -40 to +70 °C.

Selection and ordering data

Ex digital modules SIMATIC ET 200SP HA	
Digital Ex-i input module, Ex-DI 4xNAMUR Suitable for BaseUnit Type X1, channel diagnostics	**6DL1131-6TD00-0HX1**
Digital Ex-i output module, Ex-DQ 2x23,1VDC/20 mA Suitable for BaseUnit Type X1, channel diagnostics	**6DL1132-6EB00-0HX1**
Digital Ex-i output module, Ex-DQ 2x17,4VDC/27 mA Suitable for BaseUnit Type X1, channel diagnostics	**6DL1132-6CB00-0HX1**
Ex analog modules SIMATIC ET 200SP HA	
Analog Ex-i HART input module, Ex-AI 2xI 2-wire HART Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.3%	**6DL1134-6TB00-0HX1**
Analog Ex-i input module, Ex-AI 4xTC/2xRTD 2-/3-/4-wire Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.05%	**6DL1134-6JD00-0HX1**
Analog Ex-i HART output module, Ex-AQ 2xI HART HF Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.3%	**6DL1135-6TB00-0HX1**
Power module and BaseUnits	
Power module Ex-PM E 24 V 0.8 A, W x H: 50 mm x 117 mm, suitable for BaseUnit Type W0	**6DL1133-6PX00-0HW0**
BU Type X1 for I/O modules Push-in terminals, W x H: 20 mm x 117 m	**6DL1193-6BP00-0BX1**
BU Type W0 for Ex power module PM-E W x H: 50 mm x 117 mm	**6DL1193-6BP00-0DW0**

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Technical specifications

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
General information		
Product type designation	Ex-AI 2xI 2-wire HART	Ex-AI 4xTC/2xRTD 2-/3-/4-wire
Product function		
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V16	V16
• STEP 7 configurable/integrated from version	V5.6 SP2	V5.6 SP2
• PCS 7 configurable/integrated from version	V9.1	V9.1
• PCS neo can be configured/integrated from version	V3.1	V3.1
• PROFINET from GSD version/GSD revision	GSDML V2.35	GSDML V2.35
Operating mode		
• MSI	Yes	Yes
Analog inputs		
Number of analog inputs	2; Differential inputs	
• For current measurement	2	
• For voltage measurement		4
• For resistance/resistance thermometer measurement		2
• For thermocouple measurement		4
Constant measurement current for resistance-type transmitter, typ.		0.5 mA
Cycle time (all channels), min.	3 ms	
Technical unit for temperature measurement adjustable		Yes; °C/°F/K
Input ranges (rated values), voltages		
• -1 V to +1 V		Yes; 16 bit incl. sign
• -250 mV to +250 mV		Yes; 16 bit incl. sign
• -50 mV to +50 mV		Yes; 16 bit incl. sign
• -80 mV to +80 mV		Yes; 16 bit incl. sign
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes; 15 bit + sign	
Input ranges (rated values), thermocouples		
• type B		Yes; 16 bit incl. sign
• type C		Yes; 16 bit incl. sign
• Type E		Yes; 16 bit incl. sign
• Type J		Yes; 16 bit incl. sign
• Type K		Yes; 16 bit incl. sign
• Type L		Yes; 16 bit incl. sign
• Type N		Yes; 16 bit incl. sign
• Type R		Yes; 16 bit incl. sign
• Type S		Yes; 16 bit incl. sign
• Type T		Yes; 16 bit incl. sign
• Type U		Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST		Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer		
• Cu 10		Yes; 16 bit incl. sign
• Ni 100		Yes; 16 bit incl. sign
• LG-Ni 1000		Yes; 16 bit incl. sign
• Ni 120		Yes; 16 bit incl. sign
• Ni 200		Yes; 16 bit incl. sign
• Ni 500		Yes; 16 bit incl. sign
• Pt 100		Yes; 16 bit incl. sign
• Pt 1000		Yes; 16 bit incl. sign
• Pt 200		Yes; 16 bit incl. sign
• Pt 500		Yes; 16 bit incl. sign

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Technical specifications (continued)

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
Input ranges (rated values), resistors		
• 0 to 150 ohms		Yes; 15 bit
• 0 to 300 ohms		Yes; 15 bit
• 0 to 600 ohms		Yes; 15 bit
• 0 to 3000 ohms		Yes; 15 bit
• 0 to 6000 ohms		Yes; 15 bit
• PTC		Yes; 15 bit
Thermocouple (TC)		
- Temperature compensation		
- Parameterizable		Yes
Cable length		
• shielded, max.	500 m; Ex characteristic values must be observed	200 m; Ex characteristic values must be observed; line resistance at RTD (simple) max. 25 ohm; loop resistance at TC max. 8 kOhm
• unshielded, max.	300 m; Ex characteristic values must be observed	
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes; channel by channel	Yes; Channel-by-channel, results from the selected interference frequency suppression
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 Hz	16.6 / 50 / 60 Hz, channel-by-channel
• Conversion time (per channel)		180 / 60 / 50 ms, results from the selected interference frequency suppression
Smoothing of measured values		
• Number of smoothing levels	4; None; 4/8/16 times	
• Parameterizable	Yes	Yes; none, weak, medium, strong, channel-by-channel
Encoder		
Connection of signal encoders		
• for current measurement as 2-wire transducer	Yes	
- Burden of 2-wire transmitter, max.	750 Ω; At 20 mA input current	
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)		0.05 %
• Current, relative to input range, (+/-)	0.2 %	
• Resistance, relative to input range, (+/-)		0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB	70 dB
• Common mode voltage, max.		60 V; Applicable for use in non-hazardous areas; no common mode voltage permissible in hazardous areas
• Common mode interference, min.		90 dB
Protocols		
HART protocol	Yes	
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	Yes	Yes; two upper and two lower limit values in each case
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes; channel by channel	Yes; channel by channel

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Technical specifications (continued)

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
• Short-circuit	Yes; channel by channel	
• Group error	Yes	
• Overflow/Underflow	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Ex(i) characteristics		
maximum values for connecting terminals for gas group IIC		
• Uo (no-load voltage), max.	26 V	5.9 V
• Io (short-circuit current), max.	93 mA	18 mA
• Po (power output), max.	605 mW	27 mW
• Co (permissible external capacity), max.	99 nF	43 µF
• Lo (permissible external inductivity), max.	4 mH	110 mH
• Ui (intrinsically safe input voltage), max.	10 V	
• Um (voltage at non-intrinsically safe connecting terminals), max.	60 V	60 V
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	55 g	55 g

Article number	6DL1131-6TD00-0HX1 ET 200SP HA, EX-DI 4xNAMUR
General information	
Product type designation	Ex-DI 4xNAMUR
Product function	
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V16
• STEP 7 configurable/integrated from version	V5.6 SP2
• PCS 7 configurable/integrated from version	V9.1
• PCS neo can be configured/integrated from version	V3.1
• PROFINET from GSD version/GSD revision	GSDML V2.35
Operating mode	
• DI	Yes
• Counter	Yes
• MSI	Yes
Encoder supply	
Number of outputs	4

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Technical specifications (continued)

Article number	6DL1131-6TD00-0HX1 ET 200SP HA, EX-DI 4xNAMUR
Short-circuit protection	Yes
Digital inputs	
Number of digital inputs	4; NAMUR
Digital inputs, parameterizable	Yes
Pulse extension	Yes; 0.5 s, 1 s, 2 s
Time stamp	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	No
Edge evaluation	Yes; Positive edge, negative edge
Signal change flutter	Yes; 2 to 32 signal changes
Flutter observation window	Yes; 0.5 s, 1 s to 100 s in 1-s steps
Input voltage	
• Rated value (DC)	8.2 V
Input current	
- for 10 k switched contact	
- for signal "0", max.	1.2 mA
- for signal "1", min.	2.1 mA
- for unswitched contact	
- for signal "0", max. (permissible quiescent current)	0.5 mA
- for signal "1", typ.	8 mA
- for NAMUR encoders	
- for signal "0", min.	0.35 mA
- for signal "0", max.	1.2 mA
- for signal "1", min.	2.1 mA
- for signal "1", max.	6.4 mA
Input delay (for rated value of input voltage)	
- for NAMUR inputs	
- at "0" to "1", max.	12 ms
- at "1" to "0", max.	12 ms
Encoder	
Connectable encoders	
• NAMUR encoder/changeover contact according to EN 60947	Yes
• Single contact / changeover contact unconnected	Yes
• Single contact / changeover contact connected with 10 kΩ	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Hardware interrupt	Yes; channel by channel
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Monitoring of encoder power supply	Yes
• Wire break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
• Group error	Yes
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Measuring functions	

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Technical specifications (continued)

Article number	6DL1131-6TD00-0HX1 ET 200SP HA, EX-DI 4xNAMUR
- Accuracy	
- Frequency measurement	1 %
Ex(i) characteristics	
maximum values for connecting terminals for gas group IIC	
• Uo (no-load voltage), max.	9.6 V
• Io (short-circuit current), max.	61 mA; applies for up to four circuits connected in parallel
• Po (power output), max.	145 mW; applies for up to four circuits connected in parallel
• Co (permissible external capacity), max.	3.6 µF; applies for up to four circuits connected in parallel
• Lo (permissible external inductivity), max.	13 mH; applies for up to four circuits connected in parallel
• Um (voltage at non-intrinsically safe connecting terminals), max.	60 V
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g

Article number	6DL1132-6CB00-0HX1 ET 200SP HA, EX-DQ 2x17,4VDC/27MA	6DL1132-6EB00-0HX1 ET 200SP HA, EX-DQ 2x23,1VDC/20MA
General information		
Product type designation	Ex-DQ 2x17.4VDC/27mA	Ex-DQ 2x23.1VDC/20mA
Product function		
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V16	V16
• STEP 7 configurable/integrated from version	V5.6 SP2	V5.6 SP2
• PCS 7 configurable/integrated from version	V9.1	V9.1
• PCS neo can be configured/integrated from version	V3.1	V3.1
• PROFINET from GSD version/GSD revision	GSDML V2.35	GSDML V2.35
Operating mode		
• DQ	Yes	Yes
• MSO	Yes	Yes
Digital outputs		
Number of digital outputs	2	2
Current-sinking	No	No
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes; capacitive loads can cause wire-break diagnostics when the channel is switched off	Yes; capacitive loads can cause wire-break diagnostics when the channel is switched off
Overload protection	Yes	Yes
Limitation of inductive shutdown voltage to	DQ.n- (-1 V)	DQ.n- (-1 V)
Switching capacity of the outputs		
• with resistive load, max.	27 mA; See output characteristic in manual	20 mA; See output characteristic in manual

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Technical specifications (continued)

Article number	6DL1132-6CB00-0HX1 ET 200SP HA, EX-DQ 2x17,4VDC/27MA	6DL1132-6EB00-0HX1 ET 200SP HA, EX-DQ 2x23,1VDC/20MA
• with inductive load, max.	27 mA; See output characteristic in manual	20 mA; See output characteristic in manual
Load resistance range		
• lower limit	480 Ω; parallel operation 240 ohm, see output characteristic in manual	872 Ω; See output characteristic in manual
• upper limit	10 kΩ; parallel operation 5 kOhm, see output characteristic in manual	10 kΩ; See output characteristic in manual
Output current		
• for signal "1" rated value	27 mA	20 mA
• for signal "0" residual current, max.	100 µA; 250 µA test current for wire break diagnostics, parallel operation 500 µA	100 µA; 250 µA test current for wire break diagnostics
Output delay with resistive load		
• "0" to "1", typ.	50 µs	50 µs
• "1" to "0", typ.	100 µs	100 µs
Parallel switching of two outputs		
• for uprating	Yes	No
Switching frequency		
• with resistive load, max.	500 Hz	500 Hz
• with inductive load, max.	500 Hz	500 Hz
Total current of the outputs		
• Current per channel, max.	27 mA	20 mA
• Current per module, max.	54 mA	40 mA
Total current of the outputs (per module)		
- horizontal installation		
- up to 70 °C, max.	54 mA	40 mA
- vertical installation		
- up to 60 °C, max.	54 mA	40 mA
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Maintenance interrupt	Yes	Yes
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- parameterizable	Yes	Yes
• Wire break	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes
Diagnostics indication LED		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Ex(i) characteristics		
maximum values for connecting terminals for gas group IIC		
• Uo (no-load voltage), max.	19.4 V	24.8 V
• Io (short-circuit current), max.	133 mA; parallel operation 266 mA	99 mA
• Po (power output), max.	645 mW; parallel operation 1 290 mW	614 mW
• Co (permissible external capacity), max.	232 nF; parallel operation 220 nF	100 nF
• Lo (permissible external inductivity), max.	1.9 mH; parallel operation 328 uH	3.5 mH
• Um (voltage at non-intrinsically safe connecting terminals), max.	60 V	60 V
Potential separation		
Potential separation channels		

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Technical specifications (continued)

Article number	6DL1132-6CB00-0HX1 ET 200SP HA, EX-DQ 2x17,4VDC/27MA	6DL1132-6EB00-0HX1 ET 200SP HA, EX-DQ 2x23,1VDC/20MA
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	55 g	55 g

Article number	6DL1133-6PX00-0HW0 ET 200SP HA, Ex-PM E POWER MODULE
Input current	
• consumed current maximum	1.4 A
• from load voltage L+ without load maximum	50 mA
output voltage	
• rated value	24 V
• design of the overvoltage protection	Yes
Performance	
• from backplane bus	100 mW
Power dissipation	
• power loss [W] typical	4.8 W
Ex(i)-modules	
• maximum direct voltage (Um)	60 V; power supply and backplane bus
Degree of protection and class of protection	
• protection class IP	IP20
Insulation	
• type of isolation test	further information on insulation can be found in the "ET 200SP HA / ET 200SP modules for devices in hazardous areas" System Manual

Article number	6DL1135-6TB00-0HX1 ET 200SP HA, EX-AQ 2xI HART
General information	
Product type designation	Ex-AQ 2xI HART
Product function	
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V16
• STEP 7 configurable/integrated from version	V5.6 SP2
• PCS 7 configurable/integrated from version	V9.1
• PCS neo can be configured/integrated from version	V3.1
• PROFINET from GSD version/GSD revision	GSDML V2.35
Operating mode	
• MSO	Yes
Analog outputs	
Number of analog outputs	2
Cycle time (all channels), min.	3 ms
Output ranges, current	

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Technical specifications (continued)

Article number	6DL1135-6TB00-0HX1 ET 200SP HA, EX-AQ 2xI HART
• 0 to 20 mA	Yes; 15 bit
• 4 mA to 20 mA	Yes; 16 bit incl. sign
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• for current outputs, min.	50 Ω
• with current outputs, max.	500 Ω
• with current outputs, inductive load, max.	Ex characteristic values must be observed
Cable length	
• shielded, max.	500 m; Ex characteristic values must be observed
• unshielded, max.	300 m; Ex characteristic values must be observed
Analog value generation for the outputs	
Settling time	
• for resistive load	1 ms; 500 ohms
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.2 %
Protocols	
HART protocol	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes; module-wise
• Wire break	Yes; From output value > 240 µA
• Short-circuit	Yes; < 20 ohms as of 1 mA output value
• Group error	Yes
• Overflow/Underflow	Yes; channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Ex(i) characteristics	
maximum values for connecting terminals for gas group IIC	
• Uo (no-load voltage), max.	22 V
• Io (short-circuit current), max.	91 mA
• Po (power output), max.	501 mW
• Co (permissible external capacity), max.	151 nF
• Lo (permissible external inductivity), max.	4.1 mH
• Ui (intrinsically safe input voltage), max.	10 V
• Um (voltage at non-intrinsically safe connecting terminals), max.	60 V
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Altitude during operation relating to sea level	

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Technical specifications (continued)

Article number	6DL1135-6TB00-0HX1 ET 200SP HA, EX-AQ 2xI HART
• Installation altitude above sea level, max.	2 000 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g

Article number	6DL1193-6BP00-0BX1 ET 200SP HA, Ex-BU TYPE X1	6DL1193-6BP00-0DW0 ET 200SP HA, Ex-BU TYPE W0
General information		
Product type designation	BU type X1	BU type W0
Hardware configuration		
Slots		
• Number of slots	1	1
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Connection method		
Terminals		
• Terminal type	Push-in terminal	
• Conductor cross-section, min.	0.14 mm²; AWG 26	
• Conductor cross-section, max.	2.5 mm²; AWG 14	
• Number of process terminals to I/O module	8	
Dimensions		
Width	20 mm	50 mm
Height	117 mm	117 mm
Depth	35 mm	19 mm
Weights		
Weight, approx.	42 g	38 g

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Overview

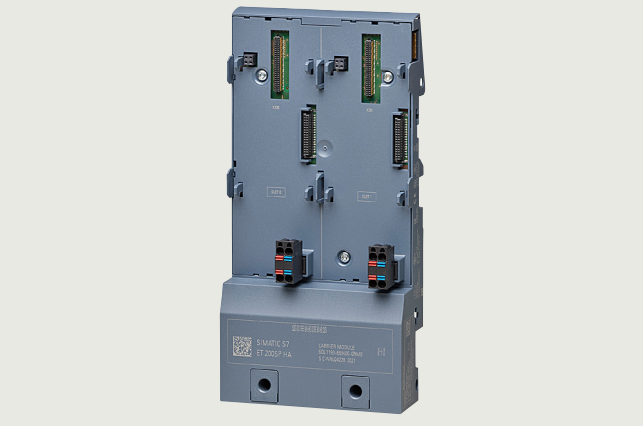
DIN rails

The DIN rail is required for fitting an ET 200SP HA station in the control cabinet. The IM carrier modules for interface modules, the carrier modules for the I/O modules and the server module are attached to the DIN rail.

The DIN rails are available in lengths of 482 mm (for installation in a 19-inch rack) and 1 500 mm (for maximum configuration and vertical installation in a cabinet).



IM single carrier module



IM redundant carrier module

IM carrier modules for interface modules

Two variants of the IM carrier modules for interface modules are available:

- IM single carrier module for 1 interface module, for single connection to PROFINET
- IM redundant carrier module for 2 interface modules, for redundant connection to PROFINET

The IM carrier modules connect the interface module to the backplane bus. They enable data exchange with the I/O modules.

Overview (continued)



Carrier module for I/O modules, 8-slot



Carrier module for I/O modules, 2-slot

Carrier modules for I/O modules

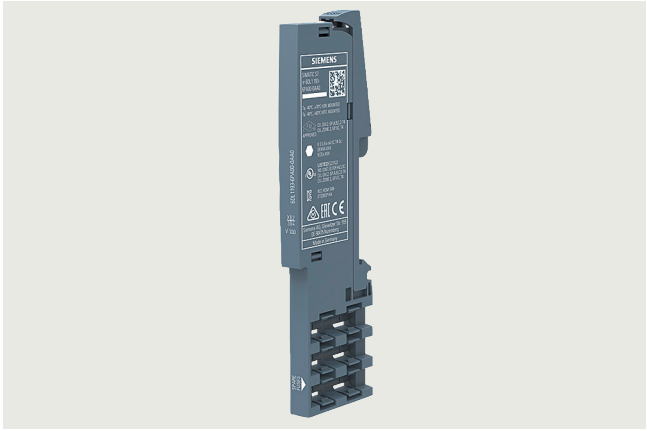
The slots for the I/O modules are created by the connection of these carrier modules to the terminal blocks.

Carrier modules for I/O modules are available in the following variants:

- Carrier module, 2-slot, with 2 slots for I/O modules
- Carrier module, 8-slot, with 8 slots for I/O modules
- Carrier module, 8-slot, with 8 slots for I/O modules, without power bus function

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Overview (continued)



ET 200SP HA, server module

Server module

Server module and power bus cover complete the design of the ET 200SP HA. A server module and a power bus cover are supplied with each IM carrier module for the interface module.

Selection and ordering data

Mounting rails for ET 200SP HA	
482 mm (approx. 19") mounting rail Including grounding screw and integrated DIN rail for fitting small components such as clamps, miniature circuit-breakers and relays	**6DL1193-6MC00-0AA0**
1 500 mm (approx. 59") mounting rail Including grounding screw and integrated DIN rail for fitting small components such as clamps, miniature circuit-breakers and relays	**6DL1193-6MD00-0AA0**
Grounding screw For connecting PE to the mounting rail; essential for 1 500 mm mounting rail 20 units per packing unit	**6ES7590-5AA00-0AA0**
IM carrier modules for interface modules Note: A server module and a power bus cover are supplied with each IM carrier module for the interface module.	
IM single carrier module Support for one SIMATIC ET 200SP HA interface module for single connection to PROFINET	**6DL1193-6BH00-0SM0**
IM redundant carrier module Support for two SIMATIC ET 200SP HA interface modules for redundant connection to PROFINET	**6DL1193-6BH00-0RM0**
IM single carrier module Support for one interface module of the ET 200SP HA, including a server module	**6DL1193-6BH01-0SM0**
IM redundant carrier module Support for two interface modules of the ET 200SP HA, including a server module	**6DL1193-6BH01-0RM0**
Carrier modules for I/O modules	
Carrier module, 2x Support for two SIMATIC ET 200SP HA I/O modules	**6DL1193-6GA00-0NN0**
Carrier module 8x Support for eight SIMATIC ET 200SP HA I/O modules	**6DL1193-6GC00-0NN0**
Carrier module 8x Support without Power Bus, can only be operated with light-gray or black terminal blocks, for holding eight I/O modules of the SIMATIC ET 200SP HA	**6DL1193-6GC00-8NN0**
Spare parts	
Server module (spare part) for ET 200SP HA	**6DL1193-6PA00-0AA0**

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Technical specifications

Article number	6DL1193-6BH00-0RM0	6DL1193-6BH00-0SM0	6DL1193-6GA00-0NN0	6DL1193-6GC00-0NN0	6DL1193-6GC00-8NN0
	CARRIER MODULE IM REDUNDANT	CARRIER MODULE IM SINGLE	CARRIER MODULE TWOFOLD	CARRIER MODULE EIGHTFOLD	CARRIER MODULE EIGHTFOLD w/o PB
General information					
Product type designation	Carrier module IM redundant	IM carrier module, single	Carrier module 2 times	Carrier module 8 times	carrier module 8x without power bus
Supply voltage					
Rated value (DC)	24 V	24 V			
Hardware configuration					
Formation of potential groups					
• support of potential groups			Yes	Yes	No; no Powerbus
Slots					
• Number of slots	2	1	2	8	8; for light gray and black terminal blocks
Potential separation					
between backplane bus and supply voltage	Yes	Yes	Yes; 4 200 V DC/1 min, type test	Yes; 4 200 V DC/1 min, type test	Yes; 4 200 V DC/1 min, type test
between the potential groups			Yes; 3 510 V AC/ 5 s, type test (between the power supply groups; due to isolating distance (increased isolation) for future ÜK-III requirement of F technology)	Yes; 3 510 V AC/ 5 s, type test (between the power supply groups; due to isolating distance (increased isolation) for future ÜK-III requirement of F technology)	Yes; 3 510 V AC/ 5 s, type test (between the power supply groups; due to isolating distance (increased isolation) for future ÜK-III requirement of F technology)
Isolation					
Isolation tested with	1 500 V DC/1 min, type test	1 500 V DC/1 min, type test	1 500 V DC/1 min, type test (between backplane bus and functional ground)	1 500 V DC/1 min, type test (between backplane bus and functional ground)	1 500 V DC/1 min, type test (between backplane bus and functional ground)
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
Dimensions					
Width	100 mm	100 mm	52.5 mm; 45 mm when installed	187.5 mm; 180 mm when installed	187.5 mm; 180 mm when installed
Height	204 mm	204 mm	203 mm	203 mm	203 mm
Depth	29 mm; measured without power plug	35 mm; measured without power plug	79 mm	79 mm	79 mm
Weights					
Weight, approx.	224 g	250 g	111 g	450 g	270 g

Article number	6DL1193-6MC00-0AA0	6DL1193-6MD00-0AA0
	MOUNTING RAIL 482MM (19")	MOUNTING RAIL 1500MM (59")
Dimensions		
Width	482 mm	1 500 mm
Height	162 mm	162 mm
Depth	18 mm	18 mm
Weights		
Weight, approx.	860 g	2 670 g

Article number	6DL1193-6PA00-0AA0
	ET200SP HA, SERVER MODULE
General information	
Product type designation	Server module
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C

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Technical specifications (continued)

Article number	6DL1193-6PA00-0AA0 ET200SP HA, SERVER MODULE
• max.	70 °C
Dimensions	
Width	7 mm
Height	117 mm
Depth	36 mm
Weights	
Weight, approx.	19 g

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Overview

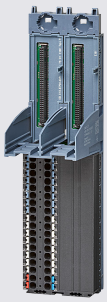
The slots for the I/O modules are created by connecting carrier modules and terminal blocks. The terminal blocks contain the process terminals for connecting sensors, actuators and other devices.

Select the terminal block for the slot of an I/O module based on the following dependencies:

- Definition of I/O modules associated with a potential group
- Requirement for design with redundant I/O modules (redundant partner in adjacent slot)
- Requirement for design with potential distributors (e.g. when using 32-channel I/O modules)

The following table illustrates the terminal block / I/O module assignment (x = standard):

I/O modules in 24 V range (with push-in terminal blocks)

I/O module	TB type H1	TB type M1 (IO-RED)	TB type F1 (F-AI IO-RED)	TB type P0 (32x L+)	TB type N0 (32x M)
DI 16x24V	x	x			x[c)]
DI 32x24V	x[a)]			x	
DI 16xNAMUR	x	x			x[c)]
DQ 16x24V / 0.5A	x	x			x[c)]
DQ 32x24V / 0.5A	x[b)]				x
DI-AI 16x / DQ 16x HART	x	x			x[c)]
AI 16xI HART	x	x			x[c)]
AI 16xTC 8xRTD	x	x			
AQ 8xI HART	x	x			x[c)]
F-DI 16x24V	x	x			x[c)]
F-DQ 10x24V / 2A	x	x			x[c)]
F-AI 8xI HART	x		x		x[c)]
					
Power bus infeed	Light gray	Light gray		Light gray	Light gray
Power bus continuer	Dark gray	Dark gray		Dark gray	Dark gray
No power bus			Black		

a) Encoder supply must be realized separately

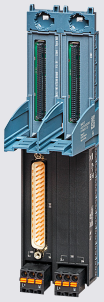
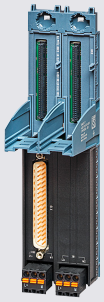
b) Ground points must be realized separately

c) Offers 32 additional ground points for field connection

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Overview (continued)

I/O modules in 24 V range (with D-sub terminal blocks)

I/O module	TB type H0 (D-sub)	TB type M0 (D-sub, IO-RED)	TB type F0 (D-sub, F-AI, IO-RED)
DI 16x24V	x	x	
DI 32x24V	x[a)]		
DI 16xNAMUR	x	x	
DQ 16x24V / 0.5A	x	x	
DQ 32x24V / 0.5A	x[b)]		
DI-AI 16x / DQ 16x HART	x	x	
AI 16xI HART	x	x	
AI 16xTC 8xRTD	x[c)]	x[c)]	
AQ 8xI HART	x	x	
F-DI 16x24V	x	x	
F-DQ 10x24V / 2A	x	x	
F-AI 8xI HART	x		x
			
Power bus infeed			
Power bus continuer			
No power bus	Black	Black	Black

a)
Encoder supply must be realized separately
b)
Ground points must be realized separately
c)
No temperature compensation for TC

I/O modules with voltages >24 V (with push-in terminal blocks)
I/O modules with channel-selective isolation (with push-in and D-sub terminal blocks)

I/O module	TB type K0 (ISOL)	TB type L0 (ISOL, IO-RED)	TB type S0 (D-sub, ISOL)	TB type R0 (D-sub, ISOL, IO-RED)
DI 8x24 ... 125V DC	x			
DI 8x230VAC	x			
RQ 4x120-230V / 5A CO	x			
AI 4xI HART ISOL	x	x	x	x
AQ 4xI HART ISOL	x	x	x	x
				
Power bus infeed	Light gray	Light gray		

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Overview (continued)

I/O module	TB type K0 (ISOL)	TB type L0 (ISOL, IO-RED)	TB type S0 (D-sub, ISOL)	TB type R0 (D-sub, ISOL, IO-RED)
Power bus continuer	Dark gray			
No power bus			Black	Black

Potential groups/color type of the terminal blocks

To help you distinguish between potential groups on an ET 200SP HA station, the terminal blocks come in different colors:

- Light gray terminal blocks are for feeding in and start a new potential group.
- Dark gray terminal blocks forms a contact with the supply voltage of the terminal block to its left, thus extending the potential group.
- Black terminal blocks do not support any potential groups and must be fed in manually. Dark gray terminal blocks must not be inserted to the right of them.

Note the maximum permissible load current depending on the number of I/O modules:

Number of terminal blocks	Permissible load current in amperes
4	10 A
5	8 A
6	7 A
7	6 A
8	5 A
10	4 A
15	3 A
20	2 A

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Selection and ordering data

Terminal blocks 24 V DC (push-in)

Terminal block type H1 light gray For starting a new potential group, with 32 push-in terminals, width 22.5 mm, with temperature compensation	**6DL1193-6TP00-0DH1**
Terminal block type H1 dark gray For forwarding a potential group, with 32 push-in terminals, width 22.5 mm, with temperature compensation	**6DL1193-6TP00-0BH1**
Terminal block type M1 light gray For starting a new potential group, with 32 push-in terminals, width 45 mm, for redundant configurations, with temperature compensation	**6DL1193-6TP00-0DM1**
Terminal block type M1 dark gray For forwarding a potential group, with 32 push-in terminals, width 45 mm, for redundant configurations, with temperature compensation	**6DL1193-6TP00-0BM1**
Terminal block, type F1, F-AI, IO-RED 32 push-in terminals, width 45 mm, for redundant configuration with fail-safe analog module F-AI, no power bus	**6DL1193-6TP00-0DF1**
Terminal block type P0 light gray For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals with encoder supply, width 45 mm, specifically for use with DI 32x24 V DC (6DL1131-6BL00-0PH1)	**6DL1193-6TP00-0DP0**
Terminal block type P0 dark gray For forwarding a potential group, with 32 push-in terminals, additional 32 push-in terminals with encoder supply, width 45 mm, specifically for use with DI 32x24 V DC (6DL1131-6BL00-0PH1)	**6DL1193-6TP00-0BP0**
Terminal block type N0 light gray For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals for ground connection, width 45 mm, for use with DQ 32x 24 V DC (6DL1132-6BL00-0PH1) and other modules	**6DL1193-6TP00-0DN0**
Terminal block type N0 dark gray For forwarding a new potential group, with 32 push-in terminals, additional 32 push-in terminals for ground connection, width 45 mm, for use with DQ 32x 24 V DC (6DL1132-6BL00-0PH1) and other modules	**6DL1193-6TP00-0BN0**

Terminal blocks 24 V DC (D-sub)

Terminal block, type H0, D-sub D-sub plug 37-pin, 24 V infeed per TB, width 22.5 mm, no power bus	**6DL1193-6TC00-0DH0**
Terminal block, type M0, D-sub, IO-RED D-sub plug 37-pin, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	**6DL1193-6TC00-0DM0**
Terminal block, type F0, D-sub, F-AI, IO-RED D-sub plug 37-pin, for fail-safe analog input, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	**6DL1193-6TC00-0DF0**
Terminal block, type S0, D-sub, ISOL D-sub plug 37-pin, 24 V infeed per TB, width 22.5 mm	**6DL1193-6TC00-0DS0**
Terminal block, type R0, D-sub, ISOL, IO-RED D-sub plug 37-pin, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	**6DL1193-6TC00-0DR0**

Selection and ordering data (continued)

Terminal blocks insulated (24 V DC / 125 V DC / 230 V AC)

Terminal block type K0 light gray For starting a new potential group, with 16 push-in terminals, width 22.5 mm	**6DL1193-6TP00-0DK0**
Terminal block type K0 dark gray For forwarding a potential group, with 16 push-in terminals, width 22.5 mm	**6DL1193-6TP00-0BK0**
Terminal block type L0 light gray For starting a new potential group, with 16 push-in terminals, width 45 mm	**6DL1193-6TP00-0DL0**

Accessories

Shield connection for terminal block 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	**6ES7193-6SC20-1AM0**

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Technical specifications

Article number	6DL1193-6TC00-0DF0 TERMINALBLOCK, TYP F0, D-SUB, F-AI, RED	6DL1193-6TC00-0DH0 TERMINAL BLOCK, TYPE H0, D-SUB	6DL1193-6TC00-0DM0 TERMINALBLOCK, TYP M0, D-SUB, IO-RED	6DL1193-6TC00-0DR0 TERMINALBLOCK, TYP R0, D-SUB, ISOL, RED	6DL1193-6TC00-0DS0 TERMINALBLOCK, TYP S0, D-SUB, ISOL
General information					
Product type designation	type F0, D-SUB, F-AI, IO-RED	type H0, SUB-D	type M0, D-SUB, IO-RED	type R0, D-SUB, ISOL, IO-RED	type S0, D-SUB, ISOL
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
external protection for power supply lines	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)
Current carrying capacity					
up to 70 °C, max.		10 A	10 A	10 A	10 A
For process terminals, max.	30 mA	2 A	2 A	2 A	2 A
Hardware configuration					
Automatic encoding	Yes				
• Type of mechanical coding element	mechanical interlock				
Temperature sensor	No	No	No	No	No
Formation of potential groups					
• support of potential groups	No; no Powerbus	No; no Powerbus	No; no Powerbus	No; no Powerbus	No; no Powerbus
Slots					
• Number of slots	2; For IO redundancy	1	2; For IO redundancy	2; For IO redundancy	1
Analog inputs					
Thermocouple (TC)					
- Temperature compensation					
- internal temperature compensation	No	No	No	No	No
Potential separation					
between backplane bus and supply voltage	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test
between potential groups (power bus)	Yes; 1 200 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 200 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 200 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 200 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 200 V DC/1 min, type test (SELV / PELV to functional ground FE)
between process terminals and supply voltage	Yes; 1 200 V DC/1 min, type test	Yes; 1 200 V DC/1 min, type test	Yes; 1 200 V DC/1 min, type test	Yes; 1 200 V DC/1 min, type test	Yes; 1 200 V DC/1 min, type test
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
Dimensions					
Width	45 mm	22.5 mm	45 mm	45 mm	22.5 mm
Height	175 mm	175 mm	175 mm	175 mm	175 mm
Depth	77 mm	77 mm	77 mm	77 mm	77 mm
Weights					
Weight, approx.	156 g	92 g	158 g	158 g	92 g

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Technical specifications (continued)

Article number	6DL1193-6TP00-0BH1 TERMINAL BLOCK, TYPE H1, DARK-GREY	6DL1193-6TP00-0BK0 TERMINAL BLOCK, TYPE K0, DARK-GREY	6DL1193-6TP00-0BM1 TERMINAL BLOCK, TYPE M1, DARK-GREY	6DL1193-6TP00-0BN0 TERMINAL BLOCK, TYPE N0, DARK-GREY	6DL1193-6TP00-0BP0 TERMINAL BLOCK, TYPE P0, DARK-GREY
General information					
Product type designation	Type H1	Type K0	Type M1	Type N0	Type P0
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Input current					
Current consumption, max.					640 mA; With one 20 mA encoder supply per channel
Current carrying capacity					
up to 70 °C, max.	10 A; Permitted load current of the potential group depending on the number of terminal blocks	10 A; Permitted load current of the potential group depending on the number of terminal blocks	10 A; Permitted load current of the potential group depending on the number of terminal blocks	10 A; Permitted load current of the potential group depending on the number of terminal blocks	10 A; Permitted load current of the potential group depending on the number of terminal blocks
For process terminals, max.	2 A	5 A	2 A	2 A	2 A
Hardware configuration					
Temperature sensor	Yes; For internal reference junction with connecting thermocouple		Yes; For internal reference junction with connecting thermocouple		
Formation of potential groups					
• support of potential groups	Yes	Yes	Yes	Yes	Yes
Slots					
• Number of slots	1	1	2; For IO redundancy	1	1
Analog inputs					
Thermocouple (TC)					
- Temperature compensation					
- internal temperature compensation	Yes		Yes		
Potential separation					
between backplane bus and supply voltage	Yes; 3 000 V DC/1 min, type test	Yes; 4 200 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test
between potential groups (power bus)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)
between process terminals and supply voltage	Yes; 1 500 V DC/1 min, type test	Yes; 4 200 V DC/1 min, type test	Yes; 1 500 V DC/1 min, type test	Yes; 1 500 V DC/1 min, type test	Yes; 1 500 V DC/1 min, type test
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
Dimensions					
Width	22.5 mm	22.5 mm	45 mm	45 mm	45 mm
Height	175 mm	175 mm	175 mm	175 mm	175 mm
Depth	77 mm	77 mm	77 mm	77 mm	77 mm
Weights					
Weight, approx.	80 g	78 g	155 g	155 g	155 g

Article number	6DL1193-6TP00-0DF1 TERMINAL BLOCK, TYP F1, F-AI, IO-RED	6DL1193-6TP00-0DH1 TERMINAL BLOCK, TYPE H1, LIGHT-GREY	6DL1193-6TP00-0DK0 TERMINAL BLOCK, TYPE K0, LIGHT-GREY	6DL1193-6TP00-0DL0 TERMINAL BLOCK, TYPE L0, LIGHT-GREY
General information				
Product type designation	Type F1	Type H1	Type K0	type L0
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V

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Technical specifications (continued)

Article number	6DL1193-6TP00-0DF1 TERMINAL BLOCK, TYP F1, F-AI, IO-RED	6DL1193-6TP00-0DH1 TERMINAL BLOCK, TYPE H1, LIGHT-GREY	6DL1193-6TP00-0DK0 TERMINAL BLOCK, TYPE K0, LIGHT-GREY	6DL1193-6TP00-0DL0 TERMINAL BLOCK, TYPE L0, LIGHT-GREY
external protection for power supply lines	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)
Current carrying capacity				
up to 70 °C, max.		10 A; Permitted load current of the potential group depending on the number of terminal blocks	10 A; Permitted load current of the potential group depending on the number of terminal blocks	10 A; Permitted load current of the potential group depending on the number of terminal blocks
For process terminals, max.	30 mA	2 A	5 A	5 A
Hardware configuration				
Automatic encoding	Yes			
• Type of mechanical coding element	mechanical interlock			
Temperature sensor	No	Yes; For internal reference junction with connecting thermocouple		
Formation of potential groups				
• support of potential groups	No; no Powerbus	Yes	Yes	Yes
Slots				
• Number of slots	2; For IO redundancy	1	1	2; For IO redundancy
Analog inputs				
Thermocouple (TC)				
- Temperature compensation				
- internal temperature compensation		Yes		
Potential separation				
between backplane bus and supply voltage	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test	Yes; 4 200 V DC/1 min, type test	Yes; 4 200 V DC/1 min, type test
between potential groups (power bus)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)
between process terminals and supply voltage	Yes; 1 500 V DC/1 min (test value higher than normatively required)	Yes; 1 500 V DC/1 min, type test	Yes; 4 200 V DC/1 min, type test	Yes; 4 200 V DC/1 min, type test
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C
Dimensions				
Width	45 mm	22.5 mm	22.5 mm	45 mm
Height	175 mm	175 mm	175 mm	175 mm
Depth	77 mm	77 mm	77 mm	77 mm
Weights				
Weight, approx.	160 g	80 g	78 g	148 g

Article number	6DL1193-6TP00-0DM1 TERMINAL BLOCK, TYPE M1, LIGHT-GREY	6DL1193-6TP00-0DN0 TERMINAL BLOCK, TYPE N0, LIGHT-GREY	6DL1193-6TP00-0DP0 TERMINAL BLOCK, TYPE P0, LIGHT-GREY
General information			
Product type designation	Type M1	Type N0	Type P0
Supply voltage			
Rated value (DC)	24 V	24 V	24 V

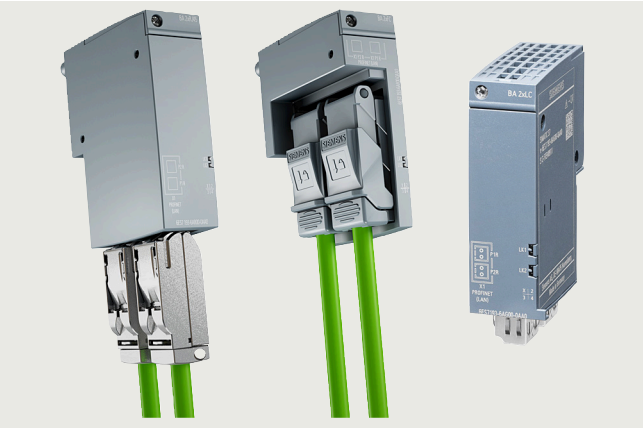
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Technical specifications (continued)

Article number	6DL1193-6TP00-0DM1 TERMINAL BLOCK, TYPE M1, LIGHT-GREY	6DL1193-6TP00-0DN0 TERMINAL BLOCK, TYPE N0, LIGHT-GREY	6DL1193-6TP00-0DP0 TERMINAL BLOCK, TYPE P0, LIGHT-GREY
external protection for power supply lines	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)	Yes; 24 V DC / 10 A (MCB with tripping characteristic type B or C, quick-response device protection fuse with sufficient breaking capacity, electronic fuse with characteristic according to type B or C)
Input current			
Current consumption, max.			640 mA; With one 20 mA encoder supply per channel
Current carrying capacity			
up to 70 °C, max.	10 A; Permitted load current of the potential group depending on the number of terminal blocks	10 A; Permitted load current of the potential group depending on the number of terminal blocks	10 A; Permitted load current of the potential group depending on the number of terminal blocks
For process terminals, max.	2 A	2 A	2 A
Hardware configuration			
Temperature sensor	Yes; For internal reference junction with connecting thermocouple		
Formation of potential groups			
• support of potential groups	Yes	Yes	Yes
Slots			
• Number of slots	2; For IO redundancy	1	1
Analog inputs			
Thermocouple (TC)			
- Temperature compensation			
- internal temperature compensation	Yes		
Potential separation			
between backplane bus and supply voltage	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test	Yes; 3 000 V DC/1 min, type test
between potential groups (power bus)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)	Yes; 1 500 V DC/1 min, type test (SELV / PELV to functional ground FE)
between process terminals and supply voltage	Yes; 1 500 V DC/1 min, type test	Yes; 1 500 V DC/1 min, type test	Yes; 1 500 V DC/1 min, type test
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C
Dimensions			
Width	45 mm	45 mm	45 mm
Height	175 mm	175 mm	175 mm
Depth	77 mm	77 mm	77 mm
Weights			
Weight, approx.	155 g	155 g	155 g

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Overview



BA 2×RJ45, 2×FC and 2×LC BusAdapters

BusAdapters

A BusAdapter as a separate component allows a free choice of connection technology:

- BA 2×RJ45: 2 electrical connections for bus cable with standard RJ45 connector
- BA 2×FC: 2 electrical connections for direct connection of FastConnect bus cable
- BA 2×LC: 2 optical ports for fiber-optic cables
- BA LC/RJ45: 1 optical connection and 1 electrical connection for bus cable with standard RJ45 connector
- BA LC/FC: 1 optical connection and 1 electrical connection for direct connection of FastConnect bus cable
- BA 2×RJ45 (VD): 2 electrical connections for using PROFINET via existing PROFIBUS cables

Selection and ordering data

BusAdapters	
2×RJ45 BusAdapter 2 × RJ45 sockets for PROFINET (standard Ethernet socket)	**6DL1193-6AR00-0AA0**
2×FC BusAdapter 2 × FastConnect (FC) connections for PROFINET	**6DL1193-6AF00-0AA0**
2×LC BusAdapter 2 × glass fiber-optic connections for PROFINET	**6DL1193-6AG00-0AA0**
BA LC/RJ45 BusAdapter 2 × glass fiber-optic connections	**6DL1193-6AG20-0AA0**
BA LC/FC BusAdapter 2 × glass fiber-optic connections	**6DL1193-6AG40-0AA0**
BA 2×RJ45 (VD) BusAdapter 2 × electrical connections for Ethernet communication via 2, 4 or 8-wire copper cables and distances up to 500 m	**6GK5991-2VA00-8AA2**
BA 2xLC-LD BusAdapter 2 × LC-LD port, for single-mode glass fiber-optic, up to max. 20 km	**6ES7193-6AG50-0AA0**
BA LC-LD/RJ45 BusAdapter 1 × LC-LD port, for single-mode fiber-optic, up to max. 20 km, 1 × RJ45 port	**6ES7193-6AG60-0AA0**

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Overview

Extending the SIMATIC ET 200SP HA system with specific additional I/O modules from the SIMATIC ET 200SP system gives you more options and flexibility.

When these I/O modules are used, the following aspects need to be considered:

- Special slot rules apply (see System Manual for the SIMATIC ET 200SP HA)
- Module redundancy is not supported for the additional I/O modules
- Attention must be paid to the specific properties of the additional I/O modules, such as ambient temperature, painting, insulation protection. These are usually limited compared to the ET 200SP HA I/O modules
- Before use, check whether (Library) Support is already available for the desired purpose

Note:

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Selection and ordering data

CM PtP communications module	
For serial communication connections with RS232, RS422, RS485 interfaces, BU type A0, color code CC00	
• CM PtP communications module (V2)	**6ES7137-6AA01-0BA0**
Analog input module	
• AI Energy Meter CT HF, for 1 A or 5 A current transformers, with network analysis functions, channel diagnostics; BU type U0	**6ES7134-6PA01-0CU0**
• AI Energy Meter RC HF, for Rogowski coils or 333 mV current/voltage transformers, with network analysis functions, channel diagnostics; BU type U0	**6ES7134-6PA21-0CU0**
TM SIWAREX WP321 weighing module	**7MH4138-6AA00-0BA0**
Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 × LC, 1 × RS 485.	
TM SIWAREX WP351 HF weighing module	
SIMATIC ET 200SP, TM SIWAREX WP351 HF, legal-for-trade weighing module for automatic dosing, filling and checking scales and totalizing weighing instruments	**7MH4138-6BA00-0CU0**
Motor starters	
Direct starter	
• Adjustment range 0.1 ... 0.4 A	**3RK1308-0AA00-0CP0**
• Adjustment range 0.3 ... 1 A	**3RK1308-0AB00-0CP0**
• Adjustment range 0.9 ... 3 A	**3RK1308-0AC00-0CP0**
• Adjustment range 2.8 ... 9 A	**3RK1308-0AD00-0CP0**
• Adjustment range 4 ... 12 A	**3RK1308-0AE00-0CP0**
Reversing starter	
• Adjustment range 0.1 ... 0.4 A	**3RK1308-0BA00-0CP0**
• Adjustment range 0.3 ... 1 A	**3RK1308-0BB00-0CP0**
• Adjustment range 0.9 ... 3 A	**3RK1308-0BC00-0CP0**
• Adjustment range 2.8 ... 9 A	**3RK1308-0BD00-0CP0**
• Adjustment range 4 ... 12 A	**3RK1308-0BE00-0CP0**
SITRANS FCT070	
Transmitter for ET 200SP	**7ME4138-6AA00-0BB1**
AirLINE SP valve terminal type 8647 for integration into ET 200SP HA	
For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly: https://www.burkert-usa.com/en/type/8647	

* *Disclaimer of liability*

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Overview



ET 200SP HA with Bürkert valve terminal AirLINE SP

- For pneumatic control of actuators with ET 200SP HA
- Can be used together with system and IO components of the ET 200SP HA distributed I/O system
- Product of the product partners Bürkert Fluid Control Systems, and can only be obtained from Bürkert Fluid Control Systems

Note:

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Benefits

- High degree of process safety by using non-return valves and pneumatic infeed modules with pressure monitoring
- System-wide detailed diagnostics in plain text, and also locally on an LC display
- Quick and easy valve change during operation (hot swapping)
- Reduced number of components in the control cabinet (enabling compact control cabinet)
- Easy and fast installation thanks to full hardware integration: Physical interfaces of pneumatic and I/O components are fully compatible
- Fast and error-free configuration and diagnostics thanks to full software integration into the Siemens ecosystem (STEP 7 Classic, PCS 7, PCS neo, TIA Portal): The Bürkert pneumatic modules are handled like Siemens I/O modules in configuration and programming

Application

Valve terminals are widely used in industrial automation, and serve as pilot valves for controlling actuators in the food, pharmaceutical and water treatment industries. In combination with the AirLINE SP, type 8647 from Bürkert Co., ET 200SP HA forms a universal interface between process and plant control, and enables the flexible, modular structure of pilot valves and I/O modules.

More information

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly at this link.

) Disclaimer of liability

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Overview



SIMATIC ET 200MP video



SIMATIC ET 200MP is a modular and scalable I/O system with degree of protection IP20 for universal use, and offers the same system advantages as SIMATIC S7-1500. SIMATIC ET 200MP permits extremely short bus cycle times and very fast response times, even with large quantity structures.

SIMATIC ET 200MP consists of the following components:

- Interface modules for connecting the S7-1500 I/O modules to PROFINET, Ethernet/IP, Modbus TCP and PROFIBUS; up to 30 modules can be connected to one interface module (up to 12 modules for PROFIBUS).
- S7-1500 I/O modules for connecting digital and analog signals, safety modules, technology modules and communications modules and processors.
- Load current supply (PM) for feeding the input and output circuit (load circuits) as well as the sensors and actuators.
- Optional system power supplies (PS) for converting AC or DC line voltages into the required operating voltages for the internal electronics of the SIMATIC S7-1500 I/O system if the power supply of the interface module is not sufficient
- U-connector for connecting the individual modules or active backplane bus for even higher performance and the option of removing and inserting modules during operation (HotSwap)
- S7-1500 mounting rail for securely fastening the I/O system in the control cabinet
- Additional accessories such as universal front connectors, cable grips and shielding sets, SIMATIC TOP connect to reduce cabling effort and variants with increased resistance to external influences (SIPLUS variants)
- Adapter solution for easy migration of S7-300 modules to S7-1500 IO (details on request)

The SIMATIC ET 200MP distributed I/O system is particularly easy to install, wire, and commission.

With its extended ambient conditions, SIMATIC ET 200MP can be used almost anywhere. Many modules can be operated in a temperature range from -30°C to +60°C and at altitudes up to

Overview (continued)

5,000 m as standard. A wide range of SIPLUS modules is available for requirements beyond this.

Highlights:

- Modular I/O system with degree of protection IP20 for PROFINET, Ethernet/IP, Modbus TCP, or alternatively for PROFIBUS
- Compact dimensions and high channel density
- High degree of user-friendliness due to the following design features:
  - High channel density through 35 mm wide modules with up to 64 digital and 16 analog channels
  - Standardized 40-pin front connector simplifies ordering, logistics, and stock-keeping
  - Standardized pin assignment per module type simplifies wiring and helps avoid errors
  - Integrated potential bridges simplify wiring and allow flexible subsequent modification of potential groups
  - The cable storage space grows along with the requirements and allows a uniform appearance even with insulated conductors with a large core cross-section and/or thick insulation
  - The prewiring position for the front connector allows convenient wiring during both first commissioning and when making changes during operation
  - The DIN rail integrated in the S7-1500 mounting rail allows snapping-on of many standard components such as additional terminals, miniature circuit breakers or small relays
  - The 1:1 assignment of channel status and diagnostics LED, terminal and inscription allows fast location and elimination of errors. Assistance is provided by the cabling diagram printed on the inside of the front doors
  - The integrated shielding concept for analog input and technology modules allows reliable and rugged operation, in particular with High Speed applications. Installation does not require any tools
  - Particularly space-saving and simple design with slim 25 mm modules and high-density modules;
    the maximum possible station configuration with power supply (PS), interface module (IM) and 30 I/O modules can be accommodated on a 830 mm wide S7-1500 mounting rail
- Extensive product portfolio comprising digital and analog input and output modules (incl. HART protocol for analog modules and connection of NAMUR encoders for digital input modules), technology modules, communications modules for IO-Link and point to point communication as well as F-modules up to SIL3.
  - Integrated technological functions in selected modules, such as counting, pulse width modulation (PWM) or integrated switching cycle counters, make cost-effective and convenient solutions possible.
  - Selected digital output modules enable safety-related load group shutdown in accordance with SIL 2 via an external safety relay.

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Overview (continued)

- Extensive system functions
  - Integrated system diagnostics when operated with S7-1500 and TIA Portal
  - Integrated switching cycle counter for relay modules enables preventive maintenance
  - Integrated operating cycles counter at 24 V DC High Feature and TRIAC modules for preventive maintenance of connected actuators, e.g. solenoid valves or other mechanical switchgear
  - Suitable for simple counting tasks with digital input modules with up to 20 kHz.
  - Consistent use of identification and maintenance data IM0 to IM3 for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.)
  - ID-Link on the side of the module for fast identification using a smart phone.
  - Uniform firmware update for the interface module and all I/O modules for subsequent function extensions (investment security)
  - Bus cycle time ≥ 250 µs and coupling to the isochronous task permit implementation of applications with high performance requirements with PROFINET
  - Up to 30 I/O modules (PROFINET) or 12 I/O modules (PROFIBUS) within a station save on interface modules and installation time
  - MMC not required with PROFINET; automatic address assignment via LLDP or manually via TIA Portal or PST tool
  - Shared device on up to two (IM 155-5 PN BA and IM 155-5 PN ST) or four (IM 155-5 MF HF) IO controllers
  - Module shared input/module shared output as system function for all S7-1500 I/O modules
- High plant availability:
  - Increased communication availability by means of Media Redundancy Protocol (MRP, MRPD) on PROFINET as well as operation of the IM 155-5 MF HF on an S7-1500 R/H using S2 redundancy;
    in addition, the IM 155-5 MF HF High Feature interface modules can be operated on an S7-400H. Configuration is carried out with STEP 7 V5.5 SP3 and a GSDML file. The IM 155-5 MF HF also supports operation on an S7-400H CPU (system redundancy).
  - Increased plant availability due to the active backplane bus for up to 12 I/O modules per station; allows reaction-free pulling and plugging of I/O modules in operation without a CPU STOP; allows holding of reserves (empty slots) for plant expansion at a later time.

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Overview

- Interface modules for connecting ET 200MP via PROFINET, Ethernet/IP, Modbus TCP or PROFIBUS
- These handle data exchange with the I/O controller in the controller
- Width 35 mm

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Overview



- Interface modules for connecting ET 200MP via PROFINET, Ethernet/IP, Modbus TCP or PROFIBUS
- These handle data exchange with the I/O controller in the controller
- Width 35 mm

Selection and ordering data

Interface module IM 155-5 Degree of protection IP20, module width 35 mm, installation on S7-1500 mounting rail	
SIMATIC ET 200MP, MultiFieldbus interface module IM 155-5 MF HF PROFINET, flexible ports via pluggable SIMATIC BusAdapters (sold separately), max. 30 I/O modules, multi hot swap with active backplane sold separately), IRT with 250 µs, isochronous mode, shared device with 4 controllers (1440 bytes each), 256 bytes per I/O module, MRP, MRPD, S2 redundancy, PN Security Class 1, optional cable grip (sold separately)	**6ES7155-5MU00-0CN0**
SIMATIC ET 200MP PROFINET IO device interface module IM 155-5 PN BA For ET 200MP electronic modules; up to 12 IO modules; integrated 2-port switch; RJ45 shared device on 2 IO controllers; MRP; FW update; I&M0...3	**6ES7155-5AA00-0AA0**
SIMATIC ET 200MP, PROFINET IO device interface module IM 155-5 PN ST For ET 200MP electronic modules; up to 12 IO modules without PS; up to 30 IO modules with additional PS; integrated 2-port switch; RJ45 shared device; MRP; IRT >=0.25 ms; isochronous mode FW update; I&M0...3; FSU with 500 ms	**6ES7155-5AA01-0AB0**
SIMATIC ET 200MP, PROFIBUS IO device interface module IM 155-5 DP ST PROFIBUS interface module for max. 12 S7-1500 modules, incl. PROFIBUS connection plug (6ES7972-0BB70-0XA0)	**6ES7155-5BA00-0AB0**
Accessories	
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules, Standard function class or above; max. cable length 50 m	**6ES7193-6AR00-0AA0**
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules, Standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	**6ES7193-6AF00-0AA0**
BA 2xM12 BusAdapter For IM 155-6PN ST, HF; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	**6ES7193-6AM00-0AA0**
SIMATIC ET 200MP, spare part front door for IM 155-5 (6ES7155-5AA00-0AB0) 5 units per packing unit	**6ES7528-0AA70-7AA0**
SIMATIC S7-1500 mounting rail Fixed lengths, with grounding elements	
SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AB60-0AA0**
SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AC40-0AA0**
SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AE80-0AA0**
SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays	**6ES7590-1AF30-0AA0**

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Selection and ordering data (continued)

SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays For cutting to length by customer, without drill holes; grounding elements must be ordered separately	**6ES7590-1AJ30-0AA0**
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	**6ES7590-1BC00-0AA0**
SIMATIC S7-1500, grounding screw For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail; 20 units per packing unit	**6ES7590-5AA00-0AA0**
Strain relief For ET 200MP interface module IM 155-5 MF HF on SIMATIC BusAdapter; 5 units	**6ES7590-5DA00-0AA0**
System power supply For supplying the S7-1500 backplane bus	
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0KA00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7505-0RA00-0AB0**
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	**6ES7505-0RB00-0AB0**
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	**6ES7507-0RA00-0AB0**
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	**6ES7590-8AA00-0AA0**
Load current supply	
SIMATIC PM 1507 24 V/3 A Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	**6EP1333-4BA00**
Power supply connector Spare part; for connecting the 24 V DC supply voltage	
Connector, socket, 2x2-pin, ET 200SP, interface module, KP32F, PN-PN coupler Grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**
SIMATIC S7-1500 / ET 200MP; active backplane bus 12 slots For plugging S7-1500 I/O modules for hot swapping; for use in the ET 200MP with IM 155-5 PN HF (from FW V4.4.1); please order S7-1500 mounting rail and slot covers separately	**6ES7590-0BL00-0AA0**
PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	

Selection and ordering data (continued)

SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	**6ES7972-0BA70-0XA0**
SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	**6ES7972-0BB70-0XA0**
SIMATIC S7-1500 / ET 200MP; slot cover For the active backplane bus of the S7-1500 for protection against ESD as well as for mechanical fixation on the S7-1500 mounting rail. Unused slots must be provided with a slot cover! 5 units per packing unit	**6ES7590-0CA00-0AA0**
PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS FastConnect bus cable	
• Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
• 20 m	**6XV1830-0EN20**
• 50 m	**6XV1830-0EN50**
• 100 m	**6XV1830-0ET10**
• 200 m	**6XV1830-0ET20**
• 500 m	**6XV1830-0ET50**
• 1000 m	**6XV1830-0EU10**
FC robust cable Bus cable with PUR sheath for use under ambient conditions of extreme mechanical stress or aggressive chemicals, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0JH10**
FC flexible cable PROFIBUS bus cable, flexible, with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1831-2K**
FC trailing cable PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-3EH10**
FC bus cable PROFIBUS Food bus cable with PE sheath for use in the food and beverages industry, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0GH10**
FC underground cable PROFIBUS underground cable, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-3FH10**
FC FRNC cable PROFIBUS bus cable, flame-retardant and halogen-free, with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0LH10**
FC trailing cable	**6XV1831-2L**
IE FC RJ45 plug 180 180° cable outlet	

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Selection and ordering data (continued)

Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	**6GK1901-1BB10-2AA0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	**6GK1901-1BB10-2AB0**
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	**6GK1901-1BB10-2AE0**
Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m minimum order quantity 20 m.	**6XV1840-2AH10**
Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	**6XV1840-3AH10**
Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	**6XV1840-4AH10**
Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	**6GK1901-1GA00**

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Technical specifications

Article number	6ES7155-5BA00-0AB0	6ES7155-5AA00-0AA0	6ES7155-5AA01-0AB0	6ES7155-5MU00-0CN0
	ET 200MP, IM155-5 DP ST	ET 200MP, IM 155-5 PN BA	ET 200MP, IM 155-5 PN ST	ET 200MP, IM 155-5 MF HF
General information				
Product type designation	IM 155-5 DP ST	IM 155-5 PN BA	IM 155-5 PN ST	IM 155-5 MF HF
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M4
• Module swapping during operation (hot swapping)	No	No	No	Yes; In combination with active backplane bus
• Isochronous mode	No	No	Yes	Yes
• IRT	No	No	Yes	Yes
• Tool changer	No	No	No	Yes; Docking station
• Local coupling, IO data	No	No	No	Yes
- Number of coupling modules				6; 1x MSO local output + max. 5x MSO local input
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	V13	V15.1	V15	
• STEP 7 configurable/integrated from version	use GSD file	use GSD file	use GSD file	use GSD file
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1			
• PROFINET from GSD version/GSD revision		GSDML V2.3	GSDML V2.3	GSDML V2.45
CiR - Configuration in RUN				
Reparameterization possible in RUN				Yes
reconfiguration possible in RUN				Yes; add IO device only
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes
Input current				
Current consumption (rated value)	0.2 A; at 24 V DC and without load	1 A; at 24 V DC and without load	0.2 A; at 24 V DC and without load	0.16 A; at 24 V DC and without load
Address area				
Address space per station				
• Address space per station, max.	244 byte; For input and output data respectively	64 byte; For input and output data respectively	512 byte; For input and output data respectively	1 440 byte; For input and output data respectively
Hardware configuration				
Integrated power supply	Yes; 14 W	Yes; 14 W	Yes; 14 W	Yes; 16 W
Rack				
• Modules per rack, max.	12; I/O modules	12; I/O modules	30; I/O modules	30; I/O modules
Submodules				
• Number of submodules per station, max.		108; 9 per I/O module	256; 9 per I/O module	256; 9 per I/O module
Interfaces				
Transmission procedure		100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces		1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)
Number of PROFIBUS interfaces	1; 1 port			
1. Interface				
Interface types				
• RJ 45 (Ethernet)		Yes	Yes	Yes; with BusAdapter
• RS 485	Yes			
• Number of ports	1	2	2	2; with BusAdapter
• integrated switch	No	Yes	Yes	Yes
• BusAdapter (PROFINET)	No	No	No	Yes; BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols				
• PROFINET IO Device		Yes	Yes	Yes
• PROFIBUS DP device	Yes			
• Open IE communication		Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7155-5BA00-0AB0	6ES7155-5AA00-0AA0	6ES7155-5AA01-0AB0	6ES7155-5MU00-0CN0
	ET 200MP, IM155-5 DP ST	ET 200MP, IM 155-5 PN BA	ET 200MP, IM 155-5 PN ST	ET 200MP, IM 155-5 MF HF
• Media redundancy		Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client / HRP client
PROFINET IO Device				
- Services				
- IRT	No	No	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Dynamic Frame Packing (DFP)		No	No	No
- PROFIenergy		No	No	No
- Prioritized startup		No	Yes	No
- Shared device		Yes	Yes	Yes
- Number of IO Controllers with shared device, max.		2	2	4; for multi-fieldbus mixed operation: 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
Interface types				
RJ 45 (Ethernet)				
• Transmission procedure		PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps		Yes	Yes	Yes
• Autonegotiation		Yes	Yes	Yes
• Autocrossing		Yes	Yes	Yes
RS 485				
• Transmission rate, max.	12 Mbit/s			
Protocols				
Supports protocol for PROFINET IO	No	Yes	Yes	Yes
PROFIsafe	Yes	Yes; FW V4.3.0 or higher	Yes	Yes
PROFIBUS	Yes	No	No	No
EtherNet/IP	No	No	No	Yes
Modbus TCP	No	No	No	Yes
Redundancy mode				
• PROFINET system redundancy (S2)		No	No	Yes; NAP S2
• PROFINET system redundancy (R1)		No	No	No
• H-Sync forwarding		No	No	Yes
- Media redundancy				
- MRP		Yes	Yes	Yes
- MRPD		No	No	Yes
EtherNet/IP				
- Services				
- CIP Implicit Messaging				Yes
- CIP Explicit Messaging				Yes
- CIP Safety				No
- Configuration control via Explicit Messaging				No
- Shared device				Yes; for multi-fieldbus mixed operation: 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
- Number of scanners with shared device, max.				2
- Updating times				
- Requested Packet Interval (RPI)				2 ms
- Address area				
- Address space per module, max.				256 byte; 246 byte outputs / 256 byte inputs
- ForwardOpen (Class1 & 32 bit Header)				500 byte; (246 byte outputs / 500 byte inputs)
- LargeForwardOpen (Class3)				4 002 byte

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Technical specifications (continued)

Article number	6ES7155-5BA00-0AB0	6ES7155-5AA00-0AA0	6ES7155-5AA01-0AB0	6ES7155-5MU00-0CN0
	ET 200MP, IM155-5 DP ST	ET 200MP, IM 155-5 PN BA	ET 200MP, IM 155-5 PN ST	ET 200MP, IM 155-5 MF HF
- Connections				
- Number of rack connections				2
Modbus TCP				
- Services				
- read coils (code=1)				Yes
- read discrete inputs (code=2)				Yes
- Read Holding Registers (Code=3)				Yes
- write single coil (code=5)				Yes
- write multiple coils (code=15)				Yes
- Write Multiple Registers (Code=16)				Yes
- Parameter change by master				Yes
- Modbus TCP Security Protocol				No
- Address space per station				
- Address space per station, max.				500 byte; (246 byte outputs / 500 byte inputs)
- Access-consistent address space				250 byte; (246 byte outputs / 250 byte inputs)
- Updating time				
- I/O request interval				2 ms
- Connections				
- number of connections per device				9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)
Open IE communication				
• TCP/IP		Yes	Yes	Yes
• UDP				Yes
• SNMP		Yes	Yes	Yes
• LLDP		Yes	Yes	Yes
• ARP				Yes
• IGMP				Yes
• Multicast				Yes
• Broadcast				Yes
• IPv4				Yes
• IPv6				No
PROFIBUS DP				
- Services				
- SYNC capability	Yes			
- FREEZE capability	Yes			
- DPV1	Yes			
Isochronous mode				
Equidistance			Yes	Yes
shortest clock pulse			250 µs	250 µs
max. cycle			4 ms	4 ms
Bus cycle time (TDP), min.			250 µs	250 µs
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• NS LED				Yes; green/red LED
• MS LED				Yes; green/red LED

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Technical specifications (continued)

Article number	6ES7155-5BA00-0AB0	6ES7155-5AA00-0AA0	6ES7155-5AA01-0AB0	6ES7155-5MU00-0CN0
	ET 200MP, IM155-5 DP ST	ET 200MP, IM 155-5 PN BA	ET 200MP, IM 155-5 PN ST	ET 200MP, IM 155-5 MF HF
• IO LED				Yes; red-green-yellow LED
• Connection display LINK TX/RX		Yes; 2x green-yellow LEDs	Yes; 2x green-yellow LEDs	Yes; 2x green LEDs on BusAdapter
• Connection display DP	Yes; green LED			
Standards, approvals, certificates				
Network loading class		2	3	3
Security				
PROFINET Security Class		0	0	1
signed firmware update				Yes
Secure Boot				Yes
safely removing data				Yes
data integrity				Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-25 °C; from FS04	-30 °C; From FS03	-25 °C; From FS03	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-25 °C; from FS04	-30 °C; From FS03	-25 °C; From FS03	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Connection method				
ET-Connection				
• via BU/BA Send	No		No	No
Mechanics/material				
Strain relief				Yes; Optional
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	360 g	236 g		260 g; without BusAdapter

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Overview



SIMATIC ET 200MP IM 155-5 MF HF



ET 200MP IM 155-5 PN BA interface module

- Interface modules for connecting ET 200MP via PROFINET, Ethernet/IP, Modbus TCP or PROFIBUS
- These handle data exchange with the I/O controller in the controller
- Width 35 mm

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS IM 155-5 PN interface module (Extended temperature range and exposure to environmental substances) IP20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail IM 155-5 PN ST, standard version	**6AG1155-5AA01-7AB0**
SIPLUS ET 200MP, IM155-5 MF MultiFieldbus interface module (Extended temperature range and exposure to environmental substances) For up to 30 I/O modules, S2 redundancy for operation on S7-400H	**6AG1155-5MU00-7CN0**
Accessories	See SIMATIC ET 200MP, IM 155-5 interface module

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Technical specifications

Article number	6AG1155-5AA01-7AB0 SIPLUS ET 200MP IM 155-5 PN ST	6AG1155-5MU00-7CN0 SIPLUS ET 200MP IM155-5 MF HF
General information		
Product type designation	IM 155-5 PN ST	IM 155-5 MF HF
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M4
• Module swapping during operation (hot swapping)	No	Yes; In combination with active backplane bus
• Isochronous mode	Yes	Yes
• IRT	Yes	Yes
• Tool changer	No	Yes; Docking station
• Local coupling, IO data	No	Yes
- Number of coupling modules		6; 1x output + max. 5x input
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
• PROFINET from GSD version/GSD revision	GSDML V2.3	GSDML V2.45
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Short-circuit protection	Yes	Yes
Input current		
Current consumption (rated value)	0.2 A	0.16 A; at 24 V DC and without load
Address area		
Address space per station		
• Address space per station, max.	512 byte; per input / output	1 440 byte; For input and output data respectively
Hardware configuration		
Integrated power supply	Yes; 14 W	Yes; 16 W
Rack		
• Modules per rack, max.	30; I/O modules	30; I/O modules
Submodules		
• Number of submodules per station, max.	256; 9 per I/O module	256; 9 per I/O module
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes	Yes; with BusAdapter
• Number of ports	2	2; with BusAdapter
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	No	Yes; BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols		
• PROFINET IO device	Yes	Yes
• Open IE communication	Yes	Yes
• Media redundancy	Yes; PROFINET MRP client	Yes; PROFINET MRP client / HRP client
PROFINET IO Device		
- Services		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Dynamic Frame Packing (DFP)	No	No
- PROFIenergy	No	No
- Prioritized startup	Yes	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	4; for multi-fieldbus mixed operation: 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
Interface types		
RJ 45 (Ethernet)		

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Technical specifications (continued)

Article number	6AG1155-5AA01-7AB0 SIPLUS ET 200MP IM 155-5 PN ST	6AG1155-5MU00-7CN0 SIPLUS ET 200MP IM155-5 MF HF
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes	Yes
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	Yes	Yes
PROFIBUS	No	No
EtherNet/IP	No	Yes
Modbus TCP	No	Yes
Redundancy mode		
• PROFINET system redundancy (S2)	No	Yes; NAP S2
• PROFINET system redundancy (R1)	No	No
• H-Sync forwarding	No	Yes
- Media redundancy		
- MRP	Yes	Yes
- MRPD	No	Yes
EtherNet/IP		
- Services		
- CIP Implicit Messaging		Yes
- CIP Explicit Messaging		Yes
- CIP Safety		No
- Configuration control via Explicit Messaging		No
- Shared device		Yes; for multi-fieldbus mixed operation: 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
- Number of scanners with shared device, max.		2
- Updating times		
- Requested Packet Interval (RPI)		2 ms
- Address area		
- Address space per module, max.		256 byte; 246 byte outputs / 256 byte inputs
- ForwardOpen (Class1 & 32 bit Header)		500 byte; (246 byte outputs / 500 byte inputs)
- LargeForwardOpen (Class3)		4 002 byte
- Connections		
- Number of rack connections		2
Modbus TCP		
- Services		
- read coils (code=1)		Yes
- read discrete inputs (code=2)		Yes
- Read Holding Registers (Code=3)		Yes
- write single coil (code=5)		Yes
- write multiple coils (code=15)		Yes
- Write Multiple Registers (Code=16)		Yes
- Parameter change by master		Yes
- Modbus TCP Security Protocol		No
- Address space per station		
- Address space per station, max.		500 byte; (246 byte outputs / 500 byte inputs)
- Access-consistent address space		250 byte; (246 byte outputs / 250 byte inputs)
- Updating time		
- I/O request interval		2 ms
- Connections		
- number of connections per device		9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)

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Technical specifications (continued)

Article number	6AG1155-5AA01-7AB0 SIPLUS ET 200MP IM 155-5 PN ST	6AG1155-5MU00-7CN0 SIPLUS ET 200MP IM155-5 MF HF
Open IE communication		
• TCP/IP	Yes	Yes
• UDP		Yes
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ARP		Yes
• IGMP		Yes
• Multicast		Yes
• Broadcast		Yes
• IPv4		Yes
• IPv6		No
Isochronous mode		
Equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
Bus cycle time (TDP), min.	250 µs	250 µs
Interrupts/diagnostics/status information		
Status indicator	Yes	Yes
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• NS LED		Yes; green/red LED
• MS LED		Yes; green/red LED
• IO LED		Yes; red-green-yellow LED
• Connection display LINK TX/RX	Yes; 2x green-yellow LEDs	Yes; 2x green LEDs on BusAdapter
Standards, approvals, certificates		
Network loading class	3	3
Security		
PROFINET Security Class	0	1
signed firmware update		Yes
Secure Boot		Yes
safely removing data		Yes
data integrity		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; ab > +60 °C no module permissible left of the IM	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C	40 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		

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Technical specifications (continued)

Article number	6AG1155-5AA01-7AB0 SIPLUS ET 200MP IM 155-5 PN ST	6AG1155-5MU00-7CN0 SIPLUS ET 200MP IM155-5 MF HF
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Connection method		
ET-Connection		
• via BU/BA Send	No	No
Mechanics/material		
Strain relief		Yes; Optional
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	250 g	260 g; without BusAdapter

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Overview



- Interface module for linking the ET 200MP to PROFIBUS
- Handles data exchange with the PROFIBUS device in the PLC
- Max. 12 I/O modules
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 125; adjustable using DIP switches
- Identification and maintenance data IM0 ... IM3

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

SIPLUS IM 155-5 DP ST interface module	**6AG1155-5BA00-2AB0**
(Extended temperature range and exposure to environmental substances)	
IP 20 degree of protection, module width 35 mm, installation on S7-1500 DIN rail	
Accessories	See SIMATIC ET 200MP, IM 155-5 DP interface module

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Technical specifications

Article number	6AG1155-5BA00-2AB0 SIPLUS ET 200MP IM155-5 DP ST
General information	
Product type designation	IM 155-5 DP ST
Product function	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	No
• Isochronous mode	No
• IRT	No
• Tool changer	No
• Local coupling, IO data	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Input current	
Current consumption (rated value)	0.2 A; at 24 V DC and without load
Address area	
Address space per station	
• Address space per station, max.	244 byte; For input and output data respectively
Hardware configuration	
Integrated power supply	Yes; 14 W
Rack	
• Modules per rack, max.	12; I/O modules
Interfaces	
Number of PROFIBUS interfaces	1; 1 port
1. Interface	
Interface types	
• RS 485	Yes
• Number of ports	1
• integrated switch	No
• BusAdapter (PROFINET)	No
Protocols	
• PROFIBUS DP device	Yes
PROFINET IO Device	
- Services	
- IRT	No
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
Protocols	
Supports protocol for PROFINET IO	No
PROFIsafe	Yes
PROFIBUS	Yes
EtherNet/IP	No
Modbus TCP	No
PROFIBUS DP	
- Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- DPV1	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes

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Technical specifications (continued)

Article number	6AG1155-5BA00-2AB0 SIPLUS ET 200MP IM155-5 DP ST
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Connection display DP	Yes; green LED
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Connection method	
ET-Connection	
• via BU/BA Send	No
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	360 g

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Overview



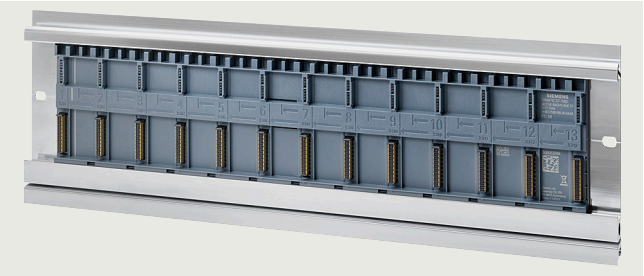
I/O modules constitute the interface of SIMATIC ET 200MP to the process:

- Digital and analog modules provide exactly the inputs/outputs required for each task
- Technology modules for SIMATIC S7-1500 and ET 200MP
  - With integrated functions for high-speed counting and position detection
  - With integrated inputs and outputs for tasks at the process level and short response times
- Communications modules for SIMATIC S7-1500 and ET 200MP
  - For data exchange using point-to-point coupling
  - For connecting to PROFIBUS
  - For connecting to Industrial Ethernet
- Connection system for user-friendly, low-overhead wiring of the S7-1500 and ET 200MP modules

I/O modules for SIMATIC ET 200MP can also be used for SIMATIC S7-1500 and are described there.

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Overview



Active backplane bus in S7-1500 DIN rail

- Considerably enhances system availability:
  - Reaction-free hot swapping of I/O modules during operation; system remains in RUN mode when replacing one or more I/O modules
  - Reserve capacity (= gaps in system configuration) for later use
- Can also be used exclusively with ET 200MP and PROFINET
- Can be inserted in the ET 200MP standard DIN rail, replaces the U connectors
- The comprehensive system functions of ET 200MP can still all be used
- Can be used with all PROFINET IO controllers by configuring via GSD file and PROFINET

Selection and ordering data

Active backplane bus With 12 slots for ET 200MP I/O modules for hot swapping; for insertion in the S7-1500 DIN rail. Please order the S7-1500 DIN rail and slot covers separately.	
• 4 slots	**6ES7590-0BD00-0AA0**
• 8 slots:	**6ES7590-0BH00-0AA0**
• 12 slots	**6ES7590-0BL00-0AA0**
Accessories	
Slot cover for active backplane bus To protect against electrostatic discharge as well as provide mechanical stability on the S7-1500 DIN rail; 5 units per packing unit	**6ES7590-0CA00-0AA0**

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Technical specifications

Article number	6ES7590-0BD00-0AA0 SIMATIC S7-1500 active backplane/4 slot	6ES7590-0BH00-0AA0 SIMATIC S7-1500 act. backplane / 8 slot	6ES7590-0BL00-0AA0 SIMATIC S7-1500 act. backplane/ 12 slot
General information			
Product type designation	Active Backplane ST 1+4 Slot	Active Backplane ST 1+8 Slot	Active backplane ST 1+12 slot
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	Yes	Yes	Yes
• Prioritized startup	Yes	Yes	Yes
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	V16 / V17	V16 / V17	V16
• STEP 7 configurable/integrated from version	V5.6 and higher	V5.6 and higher	V5.6 and higher
• PROFINET from GSD version/GSD revision	V2.35 / -	V2.35 / -	V2.34 / -
Hardware configuration			
Slots			
• Grid size	35 mm; Utilization of 25 mm-wide modules possible	35 mm; Utilization of 25 mm-wide modules possible	35 mm; Utilization of 25 mm-wide modules possible
• Number of slots	5	9	13
- of which for CPU, max.	1; for S7-1500H CPU with CPU firmware V3.1 or higher; interface modules up to V1.1.0 only (active backplane bus)	1; for S7-1500H CPU with CPU firmware V3.1 or higher; interface modules up to V1.1.0 only (active backplane bus)	0
- of which for IM, max.	1	1	1
- of which for PS, max.	4; Max. 2 PS per station	8; Max. 2 PS per station	12; Max. 2 PS per station
- of which for IO/CM/CP/TM, max.	4	8	12
- of which for F-IO, max.	4	8	12
• Number of single-width slots, max.	4	8	12
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions			
Width	154 mm	294 mm	434 mm
Height	99 mm	99 mm	99 mm
Depth	14 mm	14 mm	14 mm
Weights			
Weight, approx.	128 g	246 g	352 g

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Overview



SIMATIC BA 2xRJ45 BusAdapter



SIMATIC BA 2xM12 BusAdapter push-pull sockets



SIMATIC BA 2xFC BusAdapter

Overview (continued)

- SIMATIC BusAdapter
  For free choice of the connection system (plug-in or direct connection) of PROFINET to devices with a SIMATIC BusAdapter interface.
  One further advantage of the SIMATIC BusAdapter: only the adapter needs to be replaced for subsequent conversion to the rugged FastConnect technology or to repair defective RJ45 sockets.

Selection and ordering data

BA 2xRJ45 BusAdapter For IM 155-6 PN ST, HF, R1	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter For IM 155-6 PN ST, HF; R1; for increased resistance to vibration and EMC loads	**6ES7193-6AF00-0AA0**
BA 2xM12 BusAdapter For IM 155-6 PN ST, HF; R1; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	**6ES7193-6AM00-0AA0**
M12-180/M12-180 IE connecting cable Preassembled with IE FC trailing cable GP, M12 plugs (D-coded, push-pull)	
0.5 m	**6XV1871-8AE50**
1.0 m	**6XV1871-8AH10**
1.5 m	**6XV1871-8AH15**
2.0 m	**6XV1871-8AH20**
3.0 m	**6XV1871-8AH30**
5.0 m	**6XV1871-8AH50**
10 m	**6XV1871-8AN10**
15 m	**6XV1871-8AN15**
FC IE stripping tool	**6GK1901-1GA00**
IE FC RJ45 plug 2x2 Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet; 1 unit	**6GK1901-1BB10-2AA0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Unlatching strap for M12 BA 10 units, for push-pull PROFINET connector, e.g. when using the BA 2xM12 BusAdapter	**6ES7193-6DL00-2AA0**

Note:
You will find information on further passive components at the following link or at the following link.

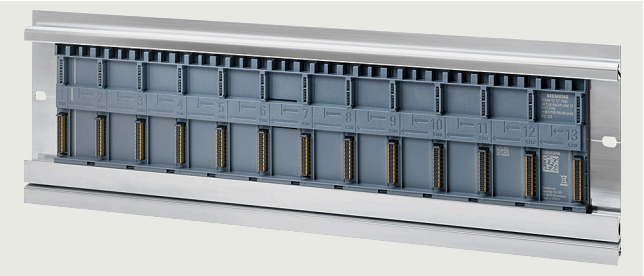
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Technical specifications

Article number	6ES7193-6AR00-0AA0 ET 200SP, Busadapter BA 2xRJ45	6ES7193-6AF00-0AA0 ET 200SP, Busadapter BA 2XFC	6ES7193-6AM00-0AA0 SIMATIC Busadapter BA 2xM12
General information			
Product type designation	BA 2x RJ45	BA 2x FC	BA 2x M12
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) 2x RJ45	1; 2 port (switch) 2x FC	1; 2 ports (switch) 2x M12
Supports protocol for PROFINET IO			
• Number of RJ45 ports	2		
• Number of FC (FastConnect) connections		2	
• Number of M12 ports			2
- Cable length			
- Cu conductors	100 m	100 m	100 m
Ambient conditions			
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	73.5 mm
Depth	59 mm	59 mm	59 mm
Weights			
Weight, approx.	46 g	53 g	59 g

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Overview



Active backplane bus in S7-1500 DIN rail

- Considerably enhances system availability:
  - Reaction-free hot swapping of I/O modules during operation; system remains in RUN mode when replacing one or more I/O modules
  - Reserve capacity (= gaps in system configuration) for later use
- Can also be used exclusively with ET 200MP and PROFINET
- Can be inserted in the ET 200MP standard DIN rail, replaces the U connectors
- The comprehensive system functions of ET 200MP can still all be used
- Can be used with all PROFINET IO controllers by configuring via GSD file and PROFINET

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Selection and ordering data

Active backplane bus	
SIPLUS S7-1500 act. backplane 8 slot with conformal coating -40...+70°C, With 8 slots for inserting S7-1500 I/O modules for hot swapping for use in the ET 200MP mit IM 155-5 PN HF (from FW V4.4.1); Please order S7-1500 mounting rail and slot covers separately	**6AG1590-0BH00-7AA0**
SIPLUS S7-1500 act. backpl. 12 slot With 12 slots for inserting S7-1500 I/O modules for hot swapping; with conformal coating -40 ... +70 °C, for use in the ET 200MP. Please order S7-1500 mounting rail and slot covers separately	**6AG1590-0BL00-7AA0**

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Technical specifications

Article number	6AG1590-0BH00-7AA0 SIPLUS S7-1500 act. backplane 8 slot	6AG1590-0BL00-7AA0 SIPLUS S7-1500 act. backplane 12 slot
General information		
Product type designation	Active Backplane ST 1+8 Slot	Active backplane ST 1+12 slot
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	Yes	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	see entry ID: 109746275
Hardware configuration		
Slots		
• Grid size	35 mm; Utilization of 25 mm-wide modules possible	35 mm; Utilization of 25 mm-wide modules possible
• Number of slots	9	13
- of which for CPU, max.	1; for S7-1500H CPU with CPU firmware V3.1 or higher; interface modules up to V1.1.0 only (active backplane bus)	0
- of which for IM, max.	1	1
- of which for PS, max.	8; Max. 2 PS per station	12; Max. 2 PS per station
- of which for IO/CM/CP/TM, max.	8	12
- of which for F-IO, max.	8	12
• Number of single-width slots, max.	8	12
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
- Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)

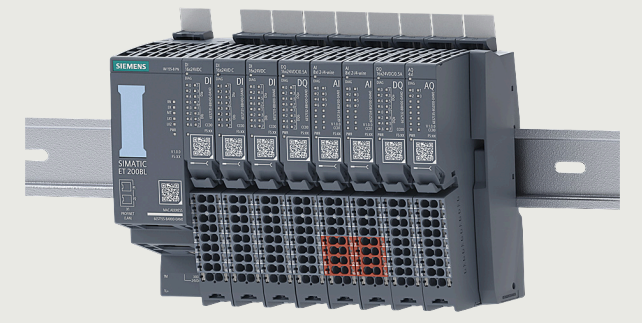
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Technical specifications (continued)

Article number	6AG1590-0BH00-7AA0 SIPLUS S7-1500 act. backplane 8 slot	6AG1590-0BL00-7AA0 SIPLUS S7-1500 act. backplane 12 slot
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions		
Width	294 mm	434 mm
Height	99 mm	99 mm
Depth	14 mm	14 mm
Weights		
Weight, approx.	246 g	352 g

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Overview



SIMATIC ET 200BL

SIMATIC ET 200BL is a cost-optimized, distributed I/O system with degree of protection IP20. Via an interface module it can exchange I/O data of the connected I/O modules with a higher-level controller. The following interface module is available for this purpose:

- PROFINET: IM 155-8 PN

The following I/O modules enable flexible connection of sensors and actuators:

- Digital input modules (DI), with removable terminal block
- Digital output modules (DQ), with removable terminal block
- Analog input modules (AI), with removable terminal block
- Analog output modules (AQ), with removable terminal block
- Communications modules (CM), with removable terminal block

Compact design

- Modular configuration with up to 16 modules
- System-integrated power bus
- 15 mm I/Os for maximum functionality in a minimum of space
- Up to 16 channels per module

Flexible connection options, reduced complexity

- Push-in terminals for conductor cross-sections up to 1.5 mm² with end sleeve, without end sleeve up to 2.5 mm²
- Optimal accessibility due to spring release and measuring tap directly on the conductor connection
- One-slice design reduces system complexity and facilitates handling

Communication standards

- PROFINET IO
- Point-to-point (RS422, RS485)
- Freeport
- Modbus RTU (master/device)

Overview (continued)

Labeling of I/O modules

- Meaningful labeling on the front of the I/O modules:
  - Module type in plain text
  - Article No.
  - Integrated ID link
  - Hardware functional status and firmware version
  - Color code of the suitable color-coding plate
  - Connection diagram

Overview of ET 200BL components

Basic components	Function
PROFINET IO interface module (IM 115-8 PN)	The interface module • Is used as I/O device on PROFINET IO • Connects ET 200BL to the I/O controller • Exchanges data with the I/O modules via the backplane bus
I/O modules	I/O modules are subdivided into the following module types: • DI (digital input) • DQ (digital output) • AI (analog input) • AQ (analog output) • CM (communications module)
End cover	The end cover closes off the rear backplane bus. It is included in the scope of supply of the interface modules.
Labeling strips	Optionally, the interface modules can be provided with labeling strips (13 x 31 mm). The labeling strips can be inscribed mechanically. The labeling strips are available in light gray: • 500 strips on the roll, for printing on thermal transfer printers. Core diameter 40 mm, outer diameter 70 mm, width 62 mm. • 10 DIN A4 sheets with 100 strips each, card 180 g/mm², perforated, for printing with a laser printer direct from TIA Portal or via print templates.
Equipment labeling plates	Optionally, one equipment labeling plate each can be attached to interface modules and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly: • The inscription on the front is not covered • Simple label replacement when replacing a module The size of the inscribable area of the labels is 14.8 x 10.5 mm (W x H).
Color-coded labels	The +/- potentials can optionally be identified using module-specific color-coded labels. Color-coded labels are supplied in packs of 10 or 50 labels. Advantages of the color-coded labels: • Quick installation (one label for marking up to 16 terminals) • Avoidance of wiring errors • Simple detection of potentials during servicing

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Overview



SIMATIC ET 200BL interface module

Data exchange between I/O modules and the higher-level PLCs takes place via the ET 200BL interface module.
The following interface variant is available for this purpose:

- IM 155-8 PN: PROFINET with integrated 2-port switch

The interface module

- can be used as an IO Device on PROFINET IO
- connects ET 200BL to the I/O controller
- exchanges data with the IO modules via the backplane bus

The end cover for the backplane bus is included in the scope of supply of the interface module.

Selection and ordering data

SIMATIC ET 200BL, PROFINET interface module IM 155-8 PN 2x integrated RJ45 socket, 16 I/O modules, PN security class 1, incl. end cover, packing unit: 1 unit	**6ES7155-8AR00-0AN0**

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Technical specifications

Article number	6ES7155-8AR00-0AN0 ET 200BL, IM 155-8 PN, PU 1
General information	
Product type designation	IM 155-8 PN
Product function	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	No
• Isochronous mode	No
• IRT	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;
• PROFINET from GSD version/GSD revision	GSDML V2.45
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Input current	
Current consumption (rated value)	350 mA
Address area	
Address space per station	
• Address space per station, max.	256 byte; For input and output data respectively
Hardware configuration	
Rack	
• number of modules per ET 200BL station, max.	16
Interfaces	
Number of PROFINET interfaces	1; 2 ports (switch)
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; 2 integrated RJ45 ports
• Number of ports	2; integrated RJ45 ports
• integrated switch	Yes
• BusAdapter (PROFINET)	No
Protocols	
• PROFINET IO device	Yes
• PROFIBUS DP device	No
• Open IE communication	Yes
• Media redundancy	No
PROFINET IO Device	
- Services	
- IRT	Yes
- PROFIenergy	No
- Prioritized startup	No
- Shared device	No
Interface types	
RJ 45 (Ethernet)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
PROFIBUS	No
EtherNet/IP	No
Modbus TCP	No
Redundancy mode	

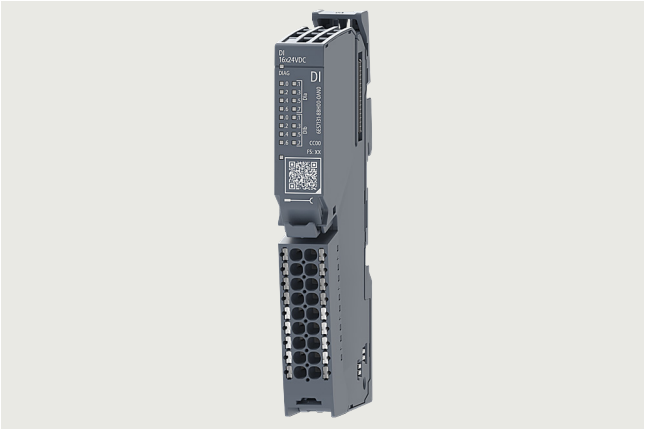
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Technical specifications (continued)

Article number	6ES7155-8AR00-0AN0 ET 200BL, IM 155-8 PN, PU 1
• PROFINET system redundancy (S2)	No
• PROFINET system redundancy (R1)	No
- Media redundancy	
- MRP	No
- MRPD	No
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green LED
Standards, approvals, certificates	
Network loading class	3
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
Dimensions	
Width	35 mm
Height	117 mm
Depth	74 mm
Weights	
Weight, approx.	96 g

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Overview



- Digital inputs
- For flexible adaptation of the controller to the respective task
- For connecting digital sensors

Selection and ordering data

SIMATIC ET 200BL, digital input module, DI 16x24 V DC Input type 1 (IEC 61131), sinking input, (PNP), packing unit: 1 unit, color code CC00, input delay 0.05...20 ms	**6ES7131-8BH00-0AN0**

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Technical specifications

Article number	6ES7131-8BH00-0AN0 ET 200BL, DI 16x24VDC, PU 1
General information	
Product type designation	DI 16x24VDC
Product function	
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;
• PROFINET from GSD version/GSD revision	GSDML V2.45
Operating mode	
• DI	Yes
• Counter	No
• Oversampling	No
• MSI	No
Supply voltage	
Rated value (DC)	24 V
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Sourcing/sinking input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes; Type 1
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 V DC to +5 V DC
• for signal "1"	15 V DC to 30 V DC
Input current	
• for signal "1", typ.	3.2 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	No
• Wire break	No
• short-circuit	No
• Group error	No
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	No
• Channel status display	Yes; green LED
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C

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Technical specifications (continued)

Article number	6ES7131-8BH00-0AN0 ET 200BL, DI 16x24VDC, PU 1
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual
Connection method	
Terminals	
• Conductor cross-section, min.	0.14 mm²; follow detailed information in System manual of ET 200BL
• Conductor cross-section, max.	2.5 mm²; follow detailed information in System manual of ET 200BL
• Number of process terminals to I/O module	16
• Number of terminals with connection to P1 and P2 bus	2
Dimensions	
Width	15 mm
Height	117 mm
Depth	74 mm
Weights	
Weight, approx.	81 g

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Overview



- Digital outputs
- For flexible adaptation of the controller to the respective task
- For connecting digital actuators

Selection and ordering data

SIMATIC ET 200BL, digital output module, DQ 16x24 V DC/0.5 A Output characteristic according to IEC 61131, sourcing output (PNP), packing unit: 1 unit, color code CC00	**6ES7132-8BH00-0AN0**
SIMATIC ET 200BL, digital output module, DQ 4x24 V DC/2 A Output characteristic according to IEC 61131, sourcing output (PNP), packing unit: 1 unit, color code CC02	**6ES7132-8BD20-0AN0**
SIMATIC ET 200BL, digital output module, DQ 8x24 V DC/2 A Output characteristic according to IEC 61131, sourcing output (PNP), packing unit: 1 unit, color code CC02	**6ES7132-8BF20-0AN0**

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Technical specifications

Article number	6ES7132-8BH00-0AN0 ET 200BL, DQ 16x24VDC/0.5A, PU 1	6ES7132-8BD20-0AN0 ET 200BL, DQ 4x24VDC/2A, PU 1	6ES7132-8BF20-0AN0 ET 200BL, DQ 8x24VDC/2A, PU 1
General information			
Product type designation	DQ 16x24VDC/0.5A	DQ 4x24VDC/2A	DQ 8x24VDC/2A
Product function			
• Isochronous mode	No	No	No
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;
• PROFINET from GSD version/GSD revision	GSDML V2.45	GSDML V2.45	GSDML V2.45
Operating mode			
• DQ	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No
• PWM	No	No	No
• Cam control (switching at comparison values)	No	No	No
• Oversampling	No	No	No
• MSO	No	No	No
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Digital outputs			
Type of digital output	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)
Number of digital outputs	16	4	8
Current-sinking	No	No	No
Current-sourcing	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes		
output type acc. to IEC 61131, type 2		Yes	Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	typ. (L+) -52 V	Type. L+ (-42 V)	Type. L+ (-42 V)
Controlling a digital input	Yes	Yes	Yes
Switching capacity of the outputs			
• with resistive load, max.	0.5 A	2 A	2 A
• with inductive load, max.		2 A	2 A
• on lamp load, max.	5 W	10 W	10 W
Load resistance range			
• lower limit	48 Ω	12 Ω	12 Ω
• upper limit	100 kΩ	3 400 Ω	3 400 Ω
Output current			
• for signal "1" rated value	0.5 A	2 A	2 A
• for signal "0" residual current, max.	5 µA	20 µA	20 µA
Output delay with resistive load			
• "0" to "1", typ.		55 µs	55 µs
• "0" to "1", max.	100 µs		
• "1" to "0", typ.		70 µs	70 µs
• "1" to "0", max.	300 µs		
Parallel switching of two outputs			
• for uprating	No	No	No
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"
• on lamp load, max.	10 Hz	10 Hz	10 Hz
Total current of the outputs			

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Technical specifications (continued)

Article number	6ES7132-8BH00-0AN0 ET 200BL, DQ 16x24VDC/0.5A, PU 1	6ES7132-8BD20-0AN0 ET 200BL, DQ 4x24VDC/2A, PU 1	6ES7132-8BF20-0AN0 ET 200BL, DQ 8x24VDC/2A, PU 1
• Current per channel, max.	0.5 A	2 A	2 A
• Current per module, max.	8 A	8 A	10 A
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	No	No	No
• short-circuit	No	No	No
• Group error	No	No	No
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation			
Potential separation digital outputs			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety functions	No	No	No
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual
Connection method			
Terminals			
• Conductor cross-section, min.	0.14 mm^2; follow detailed information in System manual of ET 200BL	0.14 mm^2; follow detailed information in System manual of ET 200BL	0.14 mm^2; follow detailed information in System manual of ET 200BL
• Conductor cross-section, max.	2.5 mm^2; follow detailed information in System manual of ET 200BL	2.5 mm^2; follow detailed information in System manual of ET 200BL	2.5 mm^2; follow detailed information in System manual of ET 200BL
• Number of process terminals to I/O module	16	16	16
• Number of terminals with connection to P1 and P2 bus	0	0	0
Dimensions			
Width	15 mm	15 mm	15 mm
Height	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm
Weights			
Weight, approx.	80 g	80 g	82 g

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Overview



- Analog inputs
- For solving even more complex tasks with analog process signals
- For connecting analog sensors

Selection and ordering data

SIMATIC ET 200BL, analog input module, AI 8xI 2/4-wire Module diagnostics, 16 bit, packing unit: 1 unit, color code CC01	**6ES7134-8GF00-0AN0**
SIMATIC ET 200BL, analog input module, AI 8xU Module diagnostics, 16 bit, packing unit: 1 unit, color code CC02	**6ES7134-8FF00-0AN0**
SIMATIC ET 200BL, analog input module, AI 4xRTD Module diagnostics, 16 bit, packing unit: 1 unit, color code CC00	**6ES7134-8LD00-0AN0**
SIMATIC ET 200BL, analog input module, AI 8xTC Module diagnostics, 16 bit, packing unit: 1 unit, color code CC00	**6ES7134-8MF00-0AN0**

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Technical specifications

Article number	6ES7134-8GF00-0AN0 ET 200BL, AI 8xI 2-/4-wire, PU 1	6ES7134-8FF00-0AN0 ET 200BL, AI 8xU, PU 1	6ES7134-8LD00-0AN0 ET 200BL, AI 4xRTD, PU1	6ES7134-8MF00-0AN0 ET 200BL, AI 8xTC, PU1
General information				
Product type designation	AI 8xI 2-/4-wire	AI 8xU	AI 4xRTD 2-/3-/4-wire	AI 8xTC
Product function				
• Isochronous mode	No	No	No	No
• Measuring range scalable	No	No	No	No
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;
• PROFINET from GSD version/GSD revision	GSDML V2.45	GSDML V2.45	GSDML V2.45	GSDML V2.45
Operating mode				
• Oversampling	No	No	No	No
• MSI	No	No	No	No
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Analog inputs				
Number of analog inputs	8; Single-ended	8; Single-ended	4; Differential inputs	8; Differential inputs
Constant measurement current for resistance-type transmitter, typ.			0.25 mA	
Cycle time (all channels), min.	50 ms; per channel	50 ms; per channel	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable			Yes; Celsius / Fahrenheit	Yes; Celsius / Fahrenheit
Input ranges (rated values), voltages				
• 0 to +10 V		Yes; 15 bit		
• -10 V to +10 V		Yes; 16 bit incl. sign		
• -80 mV to +80 mV				Yes; 16 bit incl. sign
Input ranges (rated values), currents				
• 0 to 20 mA	Yes			
• -20 mA to +20 mA	Yes			
• 4 mA to 20 mA	Yes			
Input ranges (rated values), thermocouples				
• type B				Yes; 16 bit incl. sign
• type C				Yes; 16 bit incl. sign
• Type E				Yes; 16 bit incl. sign
• Type J				Yes; 16 bit incl. sign
• Type K				Yes; 16 bit incl. sign
• Type N				Yes; 16 bit incl. sign
• Type R				Yes; 16 bit incl. sign
• Type S				Yes; 16 bit incl. sign
• Type T				Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer				
• Cu 10			Yes; 16 bit incl. sign	
• Cu 50			Yes; 16 bit incl. sign	
• Cu 100			Yes; 16 bit incl. sign	
• Ni 100			Yes; 16 bit incl. sign	
• Ni 1000			Yes; 16 bit incl. sign	
• Ni 120			Yes; 16 bit incl. sign	
• Pt 100			Yes; 16 bit incl. sign	
• Pt 1000			Yes; 16 bit incl. sign	

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Technical specifications (continued)

Article number	6ES7134-8GF00-0AN0 ET 200BL, AI 8xI 2-/4-wire, PU 1	6ES7134-8FF00-0AN0 ET 200BL, AI 8xU, PU 1	6ES7134-8LD00-0AN0 ET 200BL, AI 4xRTD, PU1	6ES7134-8MF00-0AN0 ET 200BL, AI 8xTC, PU1
• Pt 200			Yes; 16 bit incl. sign	
• Pt 500			Yes; 16 bit incl. sign	
Input ranges (rated values), resistors				
• 0 to 150 ohms			Yes; 15 bit	
• 0 to 300 ohms			Yes; 15 bit	
• 0 to 600 ohms			Yes; 15 bit	
Thermocouple (TC)				
- Temperature compensation				
- Parameterizable				Yes
Cable length				
• shielded, max.	200 m	200 m	200 m	50 m
Analog value generation for the inputs				
Integration and conversion time/resolution per channel				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz	50 / 60 Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz
• Conversion time (per channel)	60 / 50 ms	60 / 50 ms	180 / 60 / 50 ms	180 / 60 / 50 ms
Smoothing of measured values				
• Number of smoothing levels	4	4	4; None; 4/8/16 times	4; None; 4/8/16 times
• Parameterizable	Yes	Yes	Yes	Yes
Encoder				
Connection of signal encoders				
• for voltage measurement		Yes		Yes
• for current measurement as 2-wire transducer	Yes			
• for current measurement as 4-wire transducer	Yes			
• for resistance measurement with two-wire connection			Yes	
• for resistance measurement with three-wire connection			Yes	
• for resistance measurement with four-wire connection			Yes	
Errors/accuracies				
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)		0.3 %		0.05 %
• Current, relative to input range, (+/-)	0.3 %			
• Resistance, relative to input range, (+/-)			0.05 %	
• Thermocouple, relative to input range, (+/-)				0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	70 dB	70 dB	70 dB
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No	No	No	No
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7134-8GF00-0AN0 ET 200BL, AI 8xI 2-/4-wire, PU 1	6ES7134-8FF00-0AN0 ET 200BL, AI 8xU, PU 1	6ES7134-8LD00-0AN0 ET 200BL, AI 4xRTD, PU1	6ES7134-8MF00-0AN0 ET 200BL, AI 8xTC, PU1
• Wire break	Yes; module-wise	No	Yes; module-wise	Yes; module-wise
• short-circuit	No	No	No	No
• Group error	No	No	No	No
• Overflow/Underflow	Yes; module-wise	Yes; module-wise	Yes; module-wise	Yes; module-wise
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation analog inputs				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual
Connection method				
Terminals				
• Conductor cross-section, min.	0.14 mm²; follow detailed information in System manual of ET 200BL	0.14 mm²; follow detailed information in System manual of ET 200BL	0.14 mm²; follow detailed information in System manual of ET 200BL	0.14 mm²; follow detailed information in System manual of ET 200BL
• Conductor cross-section, max.	2.5 mm²; follow detailed information in System manual of ET 200BL	2.5 mm²; follow detailed information in System manual of ET 200BL	2.5 mm²; follow detailed information in System manual of ET 200BL	2.5 mm²; follow detailed information in System manual of ET 200BL
• Number of process terminals to I/O module	16	16	16	16
• Number of terminals with connection to P1 and P2 bus	2	2	2	2
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	117 mm	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm	74 mm
Weights				
Weight, approx.	81 g	81 g	81 g	82 g

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Overview



- Analog outputs
- For solving even more complex tasks with analog process signals
- For connecting analog actuators

Selection and ordering data

SIMATIC ET 200BL, analog output module, AQ 4xI Module diagnostics, 16 bit, packing unit: 1 unit, color code CC00	**6ES7135-8GD00-0AN0**
SIMATIC ET 200BL, analog output module, AQ 4xU Module diagnostics, 16 bit, packing unit: 1 unit, color code CC00	**6ES7135-8FD00-0AN0**

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Technical specifications

Article number	6ES7135-8GD00-0AN0 ET 200BL, AQ 4xI, PU 1	6ES7135-8FD00-0AN0 ET 200BL, AQ 4xU, PU 1
General information		
Product type designation	AQ 4xI	AQ 4xU
Product function		
• Isochronous mode	No	No
• Output range scalable	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;
• PROFINET from GSD version/GSD revision	GSDML V2.45	GSDML V2.45
Operating mode		
• Oversampling	No	No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Analog outputs		
Number of analog outputs	4	4
Cycle time (all channels), min.	1 ms	1 ms
Analog output with oversampling	No	No
Output ranges, voltage		
• 0 to 10 V		Yes; 15 bit
• -10 V to +10 V		Yes; 16 bit incl. sign
Output ranges, current		
• 0 to 20 mA	Yes; 15 bit	
• -20 mA to +20 mA	Yes; 16 bit incl. sign	
• 4 mA to 20 mA	Yes; 14 bit	
Connection of actuators		
• for voltage output two-wire connection	No	Yes
• for voltage output four-wire connection	No	No
• for current output two-wire connection	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.		2 kΩ
• with voltage outputs, capacitive load, max.		1 µF
• with current outputs, max.	500 Ω	
• with current outputs, inductive load, max.	1 mH	
Cable length		
• shielded, max.	1 000 m	200 m
Analog value generation for the outputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
Settling time		
• for resistive load	0.1 ms	0.2 ms
• for capacitive load		1.2 ms
• for inductive load	0.5 ms	
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output range, (+/-)		0.3 %
• Current, relative to output range, (+/-)	0.3 %	
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes; module-wise	No

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Technical specifications (continued)

Article number	6ES7135-8GD00-0AN0 ET 200BL, AQ 4xI, PU 1	6ES7135-8FD00-0AN0 ET 200BL, AQ 4xU, PU 1
• short-circuit	No	No
• Group error	No	No
• Overflow/Underflow	Yes; module-wise	Yes; module-wise
Diagnostics indication LED		
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation analog outputs		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual
Connection method		
Terminals		
• Conductor cross-section, min.	0.14 mm²; follow detailed information in System manual of ET 200BL	0.14 mm²; follow detailed information in System manual of ET 200BL
• Conductor cross-section, max.	2.5 mm²; follow detailed information in System manual of ET 200BL	2.5 mm²; follow detailed information in System manual of ET 200BL
• Number of process terminals to I/O module	16	16
• Number of terminals with connection to P1 and P2 bus	2	2
Dimensions		
Width	15 mm	15 mm
Height	117 mm	117 mm
Depth	74 mm	74 mm
Weights		
Weight, approx.	81 g	82 g

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Overview



- CM PtP RS422/485 communications module;
  Module for serial communication connections with the RS422 and RS485 interfaces for the Freeport, Modbus RTU protocols, max. 115.2 kbps, 1 KB frame length, 2 KB receive buffer.
- Supported protocols
  - Freeport:
    user-parameterizable frame format for universal communication (ASCII frame)
  - Modbus RTU master (requires instructions in the CPU)
  - Modbus RTU device (requires instructions in the CPU)
- Interface properties
  - RS422 for full-duplex connections
  - RS485 for half-duplex and multi-point connections
  - Transfer rates from 300 to 115200 bps
- Frame lengths
  - In universal operation: 1 KB each in send and receive direction
  - In performance-optimized operation: 30 bytes in send direction, 24 bytes in receive direction
- LED display for errors, operation, and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
  - Plain text identification of the module type
  - ID-Link
  - Hardware and firmware version
  - Complete Article No.
- Optional labeling accessories
  - Equipment labeling plate

Selection and ordering data

SIMATIC ET 200BL CM PtP communications module For serial connection RS422 and RS485 Freeport, Modbus RTU master, device, max. 115.2 kbps, color code CC00	**6ES7137-8BA00-0AN0**
Accessories	
SIMATIC ET 200SP/BL, 160 equipment labeling plates 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**

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Technical specifications

Article number	6ES7137-8BA00-0AN0 ET 200BL, CM PtP RS422/485
General information	
Product type designation	CM PtP RS422/485
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher; MicroWin V3.0 or higher; Configuration in ES via GSDML;
• PROFINET from GSD version/GSD revision	GSDML V2.45
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
• RS 422	Yes
• RS 232	No
• Design of the connection	Push-in terminal
Interface types	
RS 485	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	600 m; 250 m to 600 m, depending on transmission speed
RS 422	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	600 m; 250 m to 600 m, depending on transmission speed
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	No
Protocols	
Integrated protocols	
- Freeport	
- Telegram length, max.	1 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
- Modbus RTU master	
- Address area	1 to 247, extended 1 to 65535
- max. number of devices	32
- Modbus RTU device	
- Address area	1 to 247, extended 1 to 65535
Telegram buffer	
• Buffer memory for telegrams	2 kbyte
• Number of telegrams which can be buffered	255
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• for module diagnostics	Yes; green/red DIAG LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED

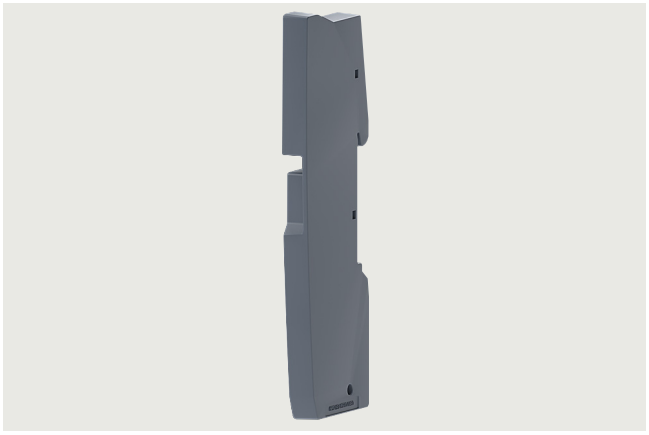
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Technical specifications (continued)

Article number	6ES7137-8BA00-0AN0 ET 200BL, CM PtP RS422/485
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200BL system manual
Connection method	
Terminals	
• Conductor cross-section, min.	0.14 mm²; follow detailed information in System manual of ET 200BL
• Conductor cross-section, max.	2.5 mm²; follow detailed information in System manual of ET 200BL
Dimensions	
Width	15 mm
Height	117 mm
Depth	74 mm
Weights	
Weight, approx.	84 g

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Overview



Accessories for SIMATIC ET 200BL:

- End cover
- Terminal block

Selection and ordering data

SIMATIC ET 200BL, end cover Spare part, end cover for complete ET 200BL station, packing unit: 5 units	**6ES7193-8SE00-1AB0**
SIMATIC ET 200BL, terminal block 24 V for I/O modules Spare part, 18x push-in terminals, packing unit: 5 units	**6ES7193-8ST00-1AN0**

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Overview



The ET 200iSP is a modular, intrinsically safe I/O system with IP30 degree of protection which can be operated in gas and dust atmospheres at ambient temperatures from -20 to +70 °C. It is optimized for use with SIMATIC PCS 7 and PCS neo, but can also be integrated in other systems such as SIMATIC S5 by means of GSD/GSDML file.

In accordance with ATEX directive 2014/34/EU, the ET 200iSP remote I/O stations can be installed directly in the hazardous zones 1 and 2 as well as in non-hazardous areas. The intrinsically safe sensors, actuators and HART field devices can also be located in zone 0 or 20 if necessary.

The modular design of the ET 200iSP makes it possible to optimally adapt the remote I/O stations to the respective automation task through individual configuration and flexible expansion. To increase plant availability, the pressure-encapsulated power supply and the intrinsically safe PROFINET or PROFIBUS DP connection of the stations can also be of redundant design. The intrinsically safe, optical PROFINET connection allows redundancy functions S2 and R1 as well as the setup of fail-safe MRP rings.

The modern architecture with hardwiring and automatic slot coding supports pre-wiring without the electronic modules, simple and reliable hot swapping of individual modules without a fire certificate as well as configuration in run (CiR).

In addition to analog and digital I/O modules for the automation of technological functions of the process (Basic Process Control), the range of electronic modules also includes fail-safe I/O modules for implementing safety applications. The various types of electronic module can be arranged mixed within a station. Comprehensive diagnostic options facilitate commissioning and troubleshooting.

Technical specifications

ET 200iSP – general		
Degree of protection	IP30	
Ambient temperature		
• Horizontal mounting position	-20 ... +70 °C	
• Other mounting positions	-20 ... +50 °C	
Exposure to environmental substances	According to ISA-S71.04 severity level G1; G2; G3 (except for NH3, only level G2 in this case)	
EMC	Electromagnetic compatibility according to NE21	
Vibration resistance	0.5 g continuously, 1 g periodically	
Approvals, standards		
• ATEX	II 2 G (1) GD I M2	Ex db eb [ia/ib] IIC T4 Ex db eb [ia/ib] I
• IECEx	Zone 1	Ex db eb [ia/ib] IIC T4
• INMETRO	Zone 1	BR-Ex db eb [ia/ib] IIC T4
• cFMus		NI Division 2, Groups A, B, C, D T4
	Class I, II, III	AIS Division 1, Groups A, B, C, D, E, F, G
	Class I	Zone 1, AEx de [ia/ib] IIC T4
• cULus		Division 2, Groups A, B, C, D T4
	Class I, II, III	providing int. safe circuits for Division 1, Groups A, B, C, D, E, F, G
	Class I	Zone 1, AEx de [ia/ib] IIC T4
• CCC Ex	Ex de ib[ia] IIC T4 Ex de [ia/ib] IIC T4	
• PROFIBUS	EN 50170, Volume 2	
• PROFINET	IEC 61158 and IEC 61784	
• IEC	IEC 61131, Part 2	
• CE	In accordance with ATEX directive 2014/34/EU, EMC Directive 2014/30/EU and LVD-guideline 2014/35/EU	
• UKCA	According to Regulations UKSI 2016:1107	
• KCC	Korea Certification	
• Marine approval	Classification companies • ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRS (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)	

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Overview



An ET 200iSP power supply unit consists of a TM-PS terminal module (A or B) and a PS power supply module which is plugged onto this. Terminal modules and power supply modules can be ordered separately.

The power supply modules are suitable for both individual operation (standard) and redundant operation. Depending on the operating mode, they must be combined with the terminal modules as follows:

- Standard: 1 × PS on TM-PS-A UC
- Redundancy: 1 × PS on TM-PS-A UC (left) plus 1 × PS on TM-PS-B UC (right)

Power supply modules are available for supplies of 24 V DC and 120/230 V AC.

The operating state of the power supply modules is indicated by two LEDs on the IM 152 interface module (one for each module).

Selection and ordering data

PS 24 V DC power supply module for ET 200iSP	**6ES7138-7EA01-0AA0**
PS 120/230 V AC power supply module for ET 200iSP	**6ES7138-7EC00-0AA0**
TM-PS-A UC terminal module For standard operation	**6ES7193-7DA20-0AA0**
TM-PS-B UC terminal module Additional terminal module for redundant operation	**6ES7193-7DB20-0AA0**

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Technical specifications

Article number	6ES7138-7EA01-0AA0 ET200ISP, POWER SUPPLY MODULE	6ES7138-7EC00-0AA0 ET200ISP, POWER SUPPLY MOD. AC120/230V
Supply voltage		
Rated value (DC)	24 V	
Rated value (AC)		230 V; 120/230 V AC
Reverse polarity protection	Yes	
Line frequency		
• permissible range, lower limit		47 Hz
• permissible range, upper limit		63 Hz
Input current		
from supply voltage L+, max.	4 A	
from supply voltage L1, max.		1.04 A; at rated voltage 230 VAC:0.45A at rated voltage 120 VAC:0.75A
Interrupts/diagnostics/status information		
Status indicator	Yes	Yes
Alarms	No	No
Diagnoses		
• Diagnostic information readable	Yes; via IM 152	Yes; via IM 152
Diagnostics indication LED		
• Group error SF (red)	No	No
Potential separation		
primary/secondary	Yes	Yes
between supply voltage and electronics	Yes	No
Standards, approvals, certificates		
CE mark	CE 0344	CE 0344
UKCA mark	DEKRA 21UKEX0027 Importer UK: Siemens plc Manchester M20 2UR	DEKRA 21UKEX0033 Importer UK: Siemens plc Manchester M20 2UR
BIS	Yes	Yes
Use in hazardous areas		
• ATEX marking	II 2 G Ex db eb [ib] IIC T4 Gb I M2 Ex db eb [ib] I Mb	II 2 G Ex db eb [ib] IIC T4 Gb I M2 Ex db eb [ib] I Mb
Dimensions		
Width	60 mm	60 mm
Height	190 mm	190 mm
Depth	136.5 mm	136.5 mm
Weights		
Weight, approx.	2 700 g	2 700 g

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Overview





The IM 152 interface module realizes the connection of the ET 200iSP to a PROFINET network with an intrinsically safe multimode glass fiber-optic cable up to 100 Mbps or to PROFIBUS DP with intrinsically safe RS 485-iS transmission technology for transfer rates of up to 1.5 Mbps. A redundant connection is also possible. In this case, the ET 200iSP is connected via two interface modules to two redundant segments of a high-availability automation system (PROFINET R1 redundancy or PROFIBUS redundancy). Alternatively, the S2 redundancy function and the setup of fail-safe MRP rings is possible with PROFINET.

The IM 152 is plugged onto a special terminal module (to be ordered separately). The following terminal modules are available:

- TM-IM/IM terminal module for two interface modules (for device redundancy)
- TM-IM/EM60 terminal module for one interface module and one watchdog, reserve or electronic module (except 2 DQ relay)
  - with blue screw-type or spring-loaded terminals for hazardous environments
  - with black screw-type terminals for non-hazardous environments

Overview (continued)

Tasks of the IM 152-1PN interface module

- Connection of ET 200iSP to the intrinsically safe, optical PROFINET network
- Autonomous communication with the host automation system
- Preparation of data for the fitted electronic modules
- Backup of electronic module parameters
- Time stamping of digital process signals with an accuracy of 20 ms

Tasks of the IM 152-1DP interface module

- Connection of ET 200iSP to the intrinsically safe PROFIBUS DP
- Autonomous communication with the host automation system
- Preparation of data for the fitted electronic modules
- Backup of electronic module parameters
- Time stamping of digital process signals with an accuracy of 20 ms

The maximum address space of the interface module is 244 bytes for inputs, and 244 bytes for outputs.

Selection and ordering data

ET 200iSP IM 152-1DP interface module	**6ES7152-1AA00-0AB0**
ET 200iSP IM 152-1PN interface module	**6ES7152-1BA00-0AB0**
ET 200iSP TM-IM/EM60 terminal module For an IM 152 and a watchdog, reserve or electronic module (except 2 DQ relay), including termination module	
• For hazardous environments	
- TM-IM/EM60S (blue screw-type terminals)	**6ES7193-7AA00-0AA0**
- TM-IM/EM60C (blue spring-loaded terminals)	**6ES7193-7AA10-0AA0**
• For non-hazardous environments	
- TM-IM/EM60S (black screw-type terminals)	**6ES7193-7AA20-0AA0**
ET 200iSP TM-IM/IM terminal module For two IM 152 modules (redundant operation), including termination module	**6ES7193-7AB00-0AA0**
Accessories	
SFP transceiver Ex Spare part for IM 152-1PN, multimode glass fiber-optic cable, LC, 50/125 µm and 62.5/125 µm	**A5E51793919**
PROFIBUS connection plug with selectable terminating resistor For connection of IM 152-1DP to PROFIBUS DP with RS 485-iS transmission technology	**6ES7972-0DA60-0XA0**
RS 485-iS coupler Isolating transformer for coupling PROFIBUS DP segments with RS 485 and RS 485-iS transmission technology	**6ES7972-0AC80-0XA0**
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 152	
• Petrol	**6ES7193-7BH00-0AA0**
• Yellow	**6ES7193-7BB00-0AA0**
S7-300 DIN rails	
• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	**6ES7390-1AF85-0AA0**
• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	**6ES7390-1AJ85-0AA0**

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Technical specifications

Article number	6ES7193-7AA00-0AA0	6ES7193-7AA10-0AA0	6ES7193-7AA20-0AA0	6ES7193-7AB00-0AA0
	ET200ISP, TERM.-MOD. TM-IM/EM60S, SCREW	ET200ISP, TERM.-MOD. TM-IM/EM60C ,SPRING	ET200ISP, TERM.-MOD. TM-IM/EM60S	ET200ISP, TERM.-MOD. TM-IM/IM F. TWO IM
Standards, approvals, certificates				
CE mark	CE 0344	CE 0344	CE 0344	CE 0344
UKCA mark	DEKRA 21UKEX0032 Importer UK: Siemens plc Manchester M20 2UR	DEKRA 21UKEX0032 Importer UK: Siemens plc Manchester M20 2UR		DEKRA 21UKEX0032 Importer UK: Siemens plc Manchester M20 2UR
Use in hazardous areas				
• ATEX marking	II 2 G (1) G Ex eb [ia Ga/ib] IIC T4 Gb II 2 G (1) D Ex eb [ia IIIC Da] IIC T4 Gb I M2 Ex eb [ia/ib] I Mb	II 2 G (1) G Ex eb [ia Ga/ib] IIC T4 Gb II 2 G (1) D Ex eb [ia IIIC Da] IIC T4 Gb I M2 Ex eb [ia/ib] I Mb		II 2 G (1) G Ex eb [ia Ga/ib] IIC T4 Gb II 2 G (1) D Ex eb [ia IIIC Da] IIC T4 Gb I M2 Ex eb [ia/ib] I Mb
Dimensions				
Width	60 mm	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm	52 mm
Weights				
Weight, approx.	235 g	235 g	235 g	195 g

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Overview



Digital input modules

- 8-channel digital input module DI NAMUR EEx i, for evaluation of NAMUR sensors, connected and non-connected contacts, as well as for use as counter or frequency meter

  Parameterizable connections:

  - NAMUR sensor on/off
  - NAMUR changeover contact
  - Single contact connected (mechanical NO contact)
  - Changeover contact connected (mechanical changeover contact)
  - Single contact non-connected (mechanical NO contact with single contact)
  - Changeover contact non-connected (mechanical changeover contact)
  - Counting function: optional use of 2 channels for recording counter pulses or for frequency measurement
  - Short-circuit and wire-break monitoring

Digital output modules

- 4-channel digital output modules DQ EEx i, 23.1 V DC/20 mA, 17.4 V DC/27 mA, 17.4 V DC/40 mA or 25.5 V DC/22 mA, with external actuator switch-off via High or Low signal (H/L switch-off)
  - Load-free switching of outputs via external intrinsically safe signal
  - Power boosting through parallel connection of two outputs for one actuator with 4 DQ 17.4 V DC/27 mA or 4 DQ 17.4 V DC/40 mA
  - Short-circuit and wire-break monitoring
- 2-channel digital output module DQ Relay EEx e, e.g. for switching solenoid valves, DC contactors or signaling lamps
  - Can be plugged onto TM-RM/RM terminal module
  - Output current up to 2 A with 60 V UC for each of the two relay outputs
  - Installation up to Ex zone 1
  - Intrinsically safe and non-intrinsically safe signals can be mixed in a station

Overview (continued)

Extra functions

Actuator shutdown function of the 4 DQ EEx i modules

The 4 DQ EEx i modules are equipped with a shutdown function. This permits implementation of an external actuator switch-off independent of the automation system (controller).

As soon as the intrinsically safe switch-off signal (High or Low) is present at the actuator switch-off input of the electronic module, its outputs are deactivated.

You can also combine several DQ modules into a switch-off group. The intrinsically safe power supply for the switch-off device is either via the watchdog module or a separate intrinsically safe source.

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Selection and ordering data

Digital input modules	
Digital input modules EEx i	
8 DI NAMUR For evaluation of NAMUR sensors, connected/non-connected contacts, as well as for recording count pulses or measuring frequencies • 8 × NAMUR (NAMUR sensor on/off, NAMUR changeover contact) or connected/non-connected inputs (single/changeover contact) • 2 channels optionally usable as counters (max. 5 kHz) or frequency meters (1 Hz ... 5 kHz) • Time stamping 20 ms, rising or falling edge • Wire-break monitoring • Short-circuit monitoring • Sensor power supply monitoring • Flutter monitoring	**6ES7131-7RF00-0AB0**
Digital output modules	
Digital output modules EEx i with H-switch-off (external actuator disconnection via H-signal); for switching of solenoid valves, DC relays, indicator lights, actuators	
4 DQ DC 23.1 V/20 mA • 4 channels with 20 mA each • Short-circuit monitoring • Wire-break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically safe signal	**6ES7132-7RD01-0AB0**
4 DQ DC 17.4 V/27 mA • 4 channels with 27 mA each or • 2 outputs connected in parallel with 54 mA each • Short-circuit monitoring • Wire-break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically safe signal	**6ES7132-7RD11-0AB0**
4 DQ DC 17.4 V/40 mA • 4 channels with 40 mA each or • 2 outputs connected in parallel with 80 mA each • Short-circuit monitoring • Wire-break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically safe signal	**6ES7132-7RD22-0AB0**
Digital output modules EEx i with L-switch-off (external actuator disconnection via L-signal); for switching of solenoid valves, DC relays, indicator lights, actuators	
4 DQ DC 23.1 V/20 mA • 4 channels with 20 mA each • Short-circuit monitoring • Wire-break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically safe signal	**6ES7132-7GD00-0AB0**
4 DQ DC 17.4 V/27 mA • 4 channels with 27 mA each or • 2 outputs connected in parallel with 54 mA each • Short-circuit monitoring • Wire-break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically safe signal	**6ES7132-7GD10-0AB0**

Selection and ordering data (continued)

4 DQ DC 17.4 V/40 mA • 4 channels with 40 mA each or • 2 outputs connected in parallel with 80 mA each • Short-circuit monitoring • Wire-break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically safe signal	**6ES7132-7GD21-0AB0**
4 DQ DC 25.5 V/22 mA[1)] • 4 channels with 22 mA each • Short-circuit monitoring • Wire-break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically safe signal	**6ES7132-7GD30-0AB0**
Digital output modules EEx e For switching of solenoid valves, DC contactors or indicator lights	
2 DQ relay, 60 V AC/DC, 2 A • Can be plugged onto TM-RM/RM terminal module • Output current up to 2 A with 60 V AC/DC for each of the two relay outputs • Installation up to hazardous zone 1 • Configurable connection of substitute value in the event of CPU failure	**6ES7132-7HB00-0AB0**
Terminal modules	
ET 200iSP TM-EM/EM60 terminal module For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in)	
• For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	**6ES7193-7CA00-0AA0**
- TM-EM/EM60C (blue spring-loaded terminals)	**6ES7193-7CA10-0AA0**
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	**6ES7193-7CA20-0AA0**
ET 200iSP TM-RM/RM 60 terminal module For two modules (electronic module 2 DQ Relay and reserve module can be plugged in)	
• TM-RM/RM60S (screw-type terminals)	**6ES7193-7CB00-0AA0**
Accessories	
Reserve module For any electronic module	**6ES7138-7AA00-0AA0**
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• Petrol	**6ES7193-7BH00-0AA0**
• Yellow	**6ES7193-7BB00-0AA0**
S7-300 mounting rails	
• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	**6ES7390-1AF85-0AA0**
• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	**6ES7390-1AJ85-0AA0**

1) Can be used with SIMATIC PCS 7 V7.1+SP2 or higher

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Technical specifications

Article number	6ES7132-7RD01-0AB0	6ES7132-7RD11-0AB0	6ES7132-7RD22-0AB0
	ET200ISP, EL-MOD., 4DO, DC 23,1V, 20MA	ET200ISP, EL-MOD., 4DO, DC 17,4V, 27MA	ET200ISP, EL-MOD., 4DO, DC 17.4V, 40MA
General information			
Product type designation	4DQ 23.1 V DC/20 mA	4DQ 17.4 V DC/27 mA	4DQ 17.4 V DC/40 mA
Digital outputs			
Type of digital output	Transistor	Transistor	Transistor
Number of digital outputs	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown
Short-circuit protection	Yes	Yes	Yes
No-load voltage Uao (DC)	23.1 V	17.4 V	17.4 V
Internal resistor Ri	275 Ω	150 Ω	167 Ω
Trend key points E			
• Voltage Ue (DC)	17.6 V	13.3 V	10.7 V
• Current Ie	20 mA	27 mA	40 mA; 80 mA when outputs connected in parallel
Output current			
• for signal "1" rated value	0.02 A	0.027 A	0.04 A
Output delay with resistive load			
• "0" to "1", max.	2 ms	2 ms	2 ms
• "1" to "0", max.	1.5 ms	1.5 ms	1.5 ms
Parallel switching of two outputs			
• for uprating	No; for Ex reasons not possible; nor for predecessor	Yes	Yes
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No	No
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Wire break	Yes; R > 10 kohms, I < 100 µA	Yes	Yes; R > 10 kohms, I < 100 µA
• Short-circuit	Yes; R< 80 Ohm (one output), R< 40 Ohm (outputs connected in parallel)	Yes	Yes; R< 80 Ohm (one output), R< 40 Ohm (outputs connected in parallel)
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel
Ex(i) characteristics			
maximum values for connecting terminals for gas group IIC			
• Uo (no-load voltage), max.	25.6 V	19.4 V	19.4 V
• Io (short-circuit current), max.	96 mA	132 mA	118 mA
• Po (power output), max.	0.61 W	0.64 W	0.57 W
• Co (permissible external capacity), max.	98 nF	0.23 µF	0.24 µF
• Lo (permissible external inductivity), max.	3 mH	1.9 mH	2.5 mH
• Ui (intrinsically safe input voltage), max.	28 V; switch input circuit	28 V; switch input circuit	28 V; switch input circuit
• Pi (intrinsically safe input power), max.	1.2 W; switch input circuit	1.2 W; switch input circuit	1.2 W; switch input circuit
• Ci (internal capacity), max.	3 nF; switch input circuit	3 nF; switch input circuit	3 nF; switch input circuit
Potential separation			
Potential separation digital outputs			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark	CE 0344	CE 0344	CE 0344
UKCA mark	DEKRA 21UKEX0085 Importer UK: Siemens plc Manchester M20 2UR	DEKRA 21UKEX0085 Importer UK: Siemens plc Manchester M20 2UR	DEKRA 21UKEX0085 Importer UK: Siemens plc Manchester M20 2UR

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Technical specifications (continued)

Article number	6ES7132-7RD01-0AB0	6ES7132-7RD11-0AB0	6ES7132-7RD22-0AB0
	ET200ISP, EL-MOD., 4DO, DC 23,1V, 20MA	ET200ISP, EL-MOD., 4DO, DC 17,4V, 27MA	ET200ISP, EL-MOD., 4DO, DC 17.4V, 40MA
Highest safety class achievable in safety mode			
• SIL acc. to IEC 61508	No		No
Use in hazardous areas			
• ATEX marking	II 2 G (1) G Ex ib [ia Ga] IIC T4 Gb II 2 G (1) D Ex ib [ia IIIC Da] IIC T4 Gb I M2 Ex ib [ia] I Mb	II 2 G (1) G Ex ib [ia Ga] IIC T4 Gb II 2 G (1) D Ex ib [ia IIIC Da] IIC T4 Gb I M2 Ex ib [ia] I Mb	II 2 G (1) G Ex ib [ia Ga] IIC T4 Gb II 2 G (1) D Ex ib [ia IIIC Da] IIC T4 Gb I M2 Ex ib [ia] I Mb
Dimensions			
Width	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm
Weights			
Weight, approx.	255 g	255 g	255 g

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Overview



Analog input modules

- 4-channel analog input module AI 2 WIRE HART EEx i for current measurement in the range 4 to 20 mA, suitable for connection of 2-wire transmitters (with/without HART functionality)
  - Resolution 12 bit + sign
  - Max. load of transmitter 750 Ω
  - Short-circuit and wire break monitoring
- 4-channel analog input module AI 4 WIRE HART EEx i for current measurement in the range 0/4 to 20 mA, suitable for connection of 4-wire transmitters (with/without HART functionality)
  - Resolution 12 bit + sign
  - Max. load of transmitter 750 Ω
  - Wire break monitoring
- 4-channel analog input module AI RTD EEx i for resistance testing and for temperature measurement by Pt100/Ni100 resistance thermometer
  - Resolution 15 bit + sign
  - 2, 3, or 4-wire connection possible
  - Resistance measurements 600 Ω absolute and 1 000 Ω absolute
  - Wire break monitoring
- 4-channel analog input module AI TC EEx i for thermoelectric EMF measurements and for temperature measurement by thermocouple, type B, E, N, J, K, L, S, R, T, U
  - Resolution 15 bit + sign
  - Internal temperature compensation possible using TC sensor module (included in scope of delivery of module)
  - External temperature compensation by means of a temperature value acquired at an analog module of the same ET 200iSP station
  - Wire break monitoring

Overview (continued)

Analog output modules

- 4-channel analog output module AO I HART EEx i for output of current signals in the range 0/4 to 20 mA to field devices (with/without HART functionality)
  - Resolution 14 bit
  - Parameterizable substitute value in case of CPU failure
  - Short-circuit and wire break monitoring

Extra functions

Temperature compensation

A TC sensor module for internal temperature compensation is provided with the 4 AI TC module, and is fitted on the corresponding terminals of the associated terminal module.

External temperature compensation is possible via a Pt100 on a 4 AI RTD module.

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Selection and ordering data

Analog input modules	
EEx i analog input modules	
4 AI I 2 WIRE HART For measuring currents with 2-wire transmitters with/without HART functionality • 4 × 4 ... 20 mA, HART, 2-wire transmitter • Transmitter load: max. 750 Ω • Resolution 12 bit + sign • Short-circuit monitoring • Wire-break monitoring	**6ES7134-7TD00-0AB0**
4 AI I 4 WIRE HART For measuring currents with 4-wire transmitters with/without HART functionality • 4 × 0/4 ... 20 mA, HART, 4-wire transmitter • Transmitter load: max. 750 Ω • Resolution 12 bit + sign • Wire-break monitoring	**6ES7134-7TD50-0AB0**
4 AI RTD For measuring resistances as well as for temperature measurements with resistance thermometers • 4 × RTD, resistance thermometer Pt100/Ni100 • 2, 3, 4-wire • Resolution 15 bit + sign • Short-circuit monitoring • Wire-break monitoring	**6ES7134-7SD51-0AB0**
4 AI TC For thermoelectric EMF measurements as well as for temperature measurements with thermocouples • 4 × TC (thermocouples) • Type B [PtRh-PtRh] • Type N [NiCrSi-NiSi] • Type E [NiCr-CuNi] • Type R [PtRh-Pt] • Type S [PtPh-Pt] • Type J [Fe-CuNi] • Type L [Fe-CuNi] • Type T [Cu-CuNi] • Type K [NiCr-Ni] • Type U [Cu-CuNi] • Resolution 15 bit + sign • Internal compensation of reference junction temperature possible using TC sensor module (included in scope of supply of module) • External temperature compensation via Pt100, connected to RTD module of same ET 200iSP station • Wire-break monitoring	**6ES7134-7SD00-0AB0**
Analog output modules	
Analog output modules EEx i	
4 AO I HART For output of currents to field devices with/without HART functionality • 4 × 0/4 ... 20 mA, HART (max. load 750 Ω) • Resolution 14-bit • Short-circuit monitoring • Wire-break monitoring • Parameterizable substitute value in case of CPU failure	**6ES7135-7TD00-0AB0**
Terminal modules	
ET 200iSP TM-EM/EM60 terminal module For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in)	
• For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	**6ES7193-7CA00-0AA0**
- TM-EM/EM60C (blue spring-loaded terminals)	**6ES7193-7CA10-0AA0**
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	**6ES7193-7CA20-0AA0**
Accessories	

Selection and ordering data (continued)

Reserve module For any electronic module	**6ES7138-7AA00-0AA0**
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• Petrol	**6ES7193-7BH00-0AA0**
• Yellow	**6ES7193-7BB00-0AA0**
S7-300 DIN rails	
• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	**6ES7390-1AF85-0AA0**
• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	**6ES7390-1AJ85-0AA0**

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Technical specifications

Article number	6ES7135-7TD00-0AB0 ET200ISP, EL-MOD., 4 AO, 4-20MA, HART
General information	
Product type designation	4AQ I HART
Analog outputs	
Number of analog outputs	4
Cycle time (all channels) max.	3.6 ms
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	750 Ω
Cable length	
• shielded, max.	500 m
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit
Settling time	
• for resistive load	4 ms
• for capacitive load	40 ms
• for inductive load	40 ms
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.1 %
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Wire break	Yes; I load > 1 mA
• Short-circuit	Yes; I load > 1 mA
Diagnostics indication LED	
• Group error SF (red)	Yes
Ex(i) characteristics	
maximum values for connecting terminals for gas group IIC	
• Uo (no-load voltage), max.	27.6 V
• Io (short-circuit current), max.	88.2 mA
• Po (power output), max.	0.61 mW
• Co (permissible external capacity), max.	83 nF
• Lo (permissible external inductivity), max.	3 mH
Potential separation	
Potential separation analog outputs	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	CE 0344
UKCA mark	DEKRA 21UKEX0091 Importer UK: Siemens plc Manchester M20 2UR
Use in hazardous areas	
• ATEX marking	II 2 G (1) G Ex ib [ia Ga] IIC T4 Gb II 2 G (1) D Ex ib [ia IIIC Da] IIC T4 Gb I M2 Ex ib [ia] I Mb
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm

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Technical specifications (continued)

Article number	6ES7135-7TD00-0AB0 ET200ISP, EL-MOD., 4 AO, 4-20MA, HART
Weights	
Weight, approx.	265 g

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Overview



The electronic modules of the SIMATIC ET 200iSP distributed I/O system equipped with safety functions can be used together with the safety-related automation systems (controllers) for the implementation of safety applications. The input modules record the process signals, evaluate them, and prepare them for additional processing by the automation system. The output modules convert the safety-related signals output by the automation systems so that they are suitable for controlling the connected actuators.

F-digital input modules

- 8 F-DI Ex NAMUR

  Safety-related digital input module for evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/non-connected mechanical contacts in hazardous and non-hazardous areas

  - SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)
  - 8 short-circuit-proof sensor supplies (8 V DC) for 1 channel each
  - Inputs and sensor supplies electrically isolated from power bus and backplane bus
  - Diagnostics evaluation (deactivated for non-connected mechanical contacts)
  - Internal diagnostics buffer
  - Programmable diagnostics interrupt
  - Supports time stamping
  - Channel-selective passivation
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors and channel status/fault

Overview (continued)

F-digital output modules

- 4 F-DO Ex DC 17.4 V/40 mA

  Safety-related digital output module for controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lights

  - SIL3/Cat.3/PLe with 4 outputs, switching to P/P potential
  - Electrical isolation from power bus and backplane bus
  - Rated load voltage 17.4 V DC
  - Max. output current 40 mA
  - Performance enhancement through parallel connection of two digital outputs for one actuator
  - Short-circuit, overload and wire-break monitoring
  - Configurable diagnostics
  - Internal diagnostics buffer
  - Programmable diagnostics interrupt
  - Channel-selective passivation
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors and channel status/fault

F-analog input modules

- 4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA)

  Safety-related digital input module for evaluating the signals from current simulators in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices

  - SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation)
  - Measuring ranges: 0 ... 20 mA or 4 ... 20 mA
  - Resolution 15 bit + sign
  - HART communication in measuring range 4 ... 20 mA
  - 4 short-circuit-proof sensor supplies (min. 12 V DC; max. 26 V DC) for 1 channel each
  - Inputs and sensor supplies electrically isolated from backplane bus
  - Configurable diagnostics
  - Programmable diagnostics interrupt
  - Internal diagnostics buffer
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors, channel faults and HART status per channel

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Selection and ordering data

Safety-related electronic modules	
F-digital input modules	
8 F-DI Ex NAMUR For evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/non-connected mechanical contacts in hazardous and non-hazardous areas • SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)	**6ES7138-7FN00-0AB0**
F-digital output modules	
4 F-DO Ex 17.4 V DC/40 mA For controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lights • SIL3/Cat.3/PLe with 4 outputs, switching to P/P potential	**6ES7138-7FD00-0AB0**
F-analog input modules	
4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA) For evaluating the signals from current simulators in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices • SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation) • Resolution 15 bit + sign • HART communication in measuring range 4 ... 20 mA	**6ES7138-7FA00-0AB0**
Terminal modules	
ET 200iSP TM-EM/EM60 terminal module For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in)	
• For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	**6ES7193-7CA00-0AA0**
- TM-EM/EM60C (blue spring-loaded terminals)	**6ES7193-7CA10-0AA0**
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	**6ES7193-7CA20-0AA0**
Accessories	
Reserve module For any electronic module	**6ES7138-7AA00-0AA0**
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• Petrol	**6ES7193-7BH00-0AA0**
• Yellow	**6ES7193-7BB00-0AA0**
S7-300 DIN rails	
• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	**6ES7390-1AF85-0AA0**
• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	**6ES7390-1AJ85-0AA0**

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Technical specifications

Article number	6ES7138-7FN00-0AB0 ET200ISP, 8F-DI NAMUR EX, FAILSAFE
General information	
Product type designation	8F-DI ExNAMUR
Encoder supply	
Number of outputs	8
Digital inputs	
Number of digital inputs	8
Input current	
• for signal "0", max. (permissible quiescent current)	1.2 mA
• for signal "1", min.	2.1 mA
• for signal "1", typ.	9.5 mA
Encoder	
Number of connectable encoders, max.	8
Connectable encoders	
• NAMUR encoder	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
Diagnoses	
• Diagnostic information readable	Yes
• Wire break	Yes; NAMUR encoders or single contact with 10 kOhm parallel resistor
• Short-circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234
Diagnostics indication LED	
• Group error SF (red)	Yes
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Use in hazardous areas	
• ATEX marking	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	288 g

Article number	6ES7138-7FD00-0AB0 ET200ISP, 4F-DO 40MA EX, FAILSAFE
General information	
Product type designation	4F-DQ Ex(i) 17.4 V DC/40 mA
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4
Short-circuit protection	Yes
Controlling a digital input	No
No-load voltage Uao (DC)	17.4 V
Internal resistor Ri	167 Ω

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Technical specifications (continued)

Article number	6ES7138-7FD00-0AB0 ET200ISP, 4F-DO 40MA EX, FAILSAFE
Load resistance range	
• lower limit	270 Ω
• upper limit	18 kΩ
Trend key points E	
• Voltage Ue (DC)	10.7 V
• Current Ie	40 mA
Output voltage	
• for signal "1", max.	17.4 V
Output current	
• for signal "0" residual current, max.	10 µA
Parallel switching of two outputs	
• for uprating	Yes
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	2 Hz
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Wire break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
Potential separation	
Potential separation digital outputs	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	285 g

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Overview



The watchdog module has two fundamental functions:

- Monitoring of the ET 200iSP remote I/O station for hardware failures (hardware lifebeat); external, applicative failure monitoring is also possible via an I/O address area of the module
- Intrinsically-safe power supply for external actuator switch-off

The watchdog module must be plugged onto a terminal module (order separately). The following terminal modules are suitable for this:

- TM-IM/EM60 terminal modules for one interface module and one watchdog, reserve or electronics module (for versions, see Interface module section)
- TM-EM/EM60 terminal modules with two slots for watchdog module, reserve module or electronics modules (except 2 DO relay):
  - with blue screw-type or spring-loaded terminals for hazardous environments
  - with black screw-type terminals for non-hazardous environments

The first slot directly next to the interface module is provided for the watchdog module.

Selection and ordering data

Watchdog module	
Watchdog module For failure monitoring and for the intrinsically safe power supply of an external actuator disconnection	**6ES7138-7BB00-0AB0**
Terminal modules	
ET 200iSP TM-EM/EM60 terminal module For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in)	
• For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	**6ES7193-7CA00-0AA0**
- TM-EM/EM60C (blue spring-loaded terminals)	**6ES7193-7CA10-0AA0**
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	**6ES7193-7CA20-0AA0**
Accessories	
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• Petrol	**6ES7193-7BH00-0AA0**
• Yellow	**6ES7193-7BB00-0AA0**

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Technical specifications

Article number	6ES7138-7BB00-0AB0 ET 200ISP, WATCHDOG MOD.
General information	
Product type designation	Watchdog module
Digital inputs	
Number of digital inputs	0
Interrupts/diagnostics/status information	
Diagnoses	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
Ex(i) characteristics	
maximum values for connecting terminals for gas group IIC	
• Uo (no-load voltage), max.	12.7 V
• Io (short-circuit current), max.	329 mA
• Po (power output), max.	0.91 W
• Co (permissible external capacity), max.	1 µF
• Lo (permissible external inductivity), max.	0.3 mH
Standards, approvals, certificates	
CE mark	CE 0344
UKCA mark	DEKRA 21UKEX0028 Importer UK: Siemens plc Manchester M20 2UR
Use in hazardous areas	
• ATEX marking	II 2 G Ex ib IIC T4 Gb I M2 Ex ib I Mb
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm

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Overview



Tasks of the RS 485-iS coupler

- Conversion of the electrical PROFIBUS DP RS 485 transmission technology into the intrinsically-safe RS 485-iS transmission technology with a transmission rate of 1.5 Mbps
- Required to connect intrinsically-safe PROFIBUS DP stations, e.g. ET 200iSP or devices from other vendors with Ex i DP connection
- Acts as a safety barrier
- Additional use as a repeater in the hazardous area
- Passive bus station (no configuration necessary)
- Certified according to ATEX 100a

Selection and ordering data

RS 485-iS coupler Isolating transformer for connection of PROFIBUS DP segments with RS 485 and RS 485-iS transmission systems	**6ES7972-0AC80-0XA0**
Accessories	
PROFIBUS connection plug with selectable terminating resistor For connection of IM 152 to PROFIBUS DP with RS 485-iS transmission technology	**6ES7972-0DA60-0XA0**
S7-300 DIN rails Lengths:	
• 160 mm	**6ES7390-1AB60-0AA0**
• 482 mm	**6ES7390-1AE80-0AA0**
• 530 mm	**6ES7390-1AF30-0AA0**
• 830 mm	**6ES7390-1AJ30-0AA0**
• 2 000 mm	**6ES7390-1BC00-0AA0**
PROFIBUS FastConnect standard cable, violet Standard type with special design for fast mounting, 2-wire, shielded, cut-to-length Specify length in m Max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0EH10**
Preferred lengths	
- 20 m	**6XV1830-0EN20**
- 50 m	**6XV1830-0EN50**
- 100 m	**6XV1830-0ET10**
- 200 m	**6XV1830-0ET20**
- 500 m	**6XV1830-0ET50**
- 1 000 m	**6XV1830-0EU10**
PROFIBUS FastConnect standard cable IS GP, blue Cable type for use in potentially explosive atmospheres, with special design for fast mounting, 2-wire, shielded, cut-to-length Specify length in m Max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1831-2A**

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Technical specifications

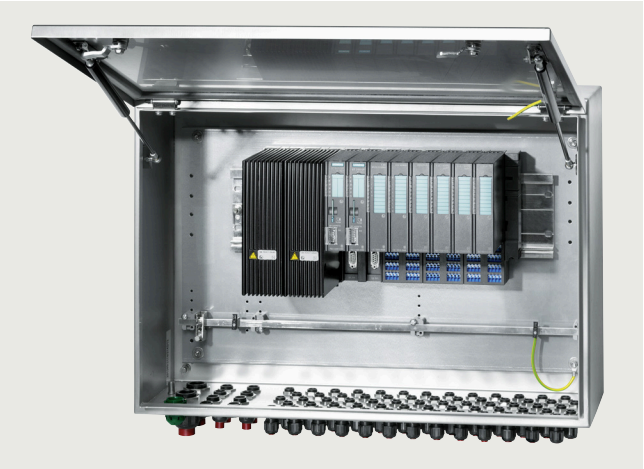
Technical specifications - RS 485-iS coupler	
Dimensions and weight	
Dimensions W x H x D (mm)	80 × 125 × 130
Weight	Approx. 500 g
Technical specifications - General	
Degree of protection	IP20
Ambient temperature	- 20 ...+ 60 °C
Standards and approvals	
• PROFIBUS	IEC 61784-1:2002 Ed1 CP 3/1
• EU directive	94/9/EG (ATEX 100a)
• CENELEC	II 3 (2) G EEx nA[ib] IIC T4
• UL and CSA	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Divison 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
• FM	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Divison 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
• IEC	IEC61131-2, Part 2
• CE	Conforming with 89/336/EWG Conforming with 73/23/EWG
• Ship-building certification	Classification companies • ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRD (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)
Module-specific Data	
Transfer rate on PROFIBUS DP, PROFIBUS RS 485-iS	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbps 1.5 Mbps
Bus-Protocol	PROFIBUS DP
Voltages, Currents, Potentials	
Rated supply voltage of RS 485-iS coupler	24 V DC (20.4 ... 28.8 V)
• Reverse polarity protection	Yes
• Voltage failure bypass	Min. 5 ms
Electrical isolation of 24 V power supply	
• to PROFIBUS DP	Yes
- tested with	500 V DC
• to PROFIBUS RS 485-iS	Yes
- tested with	AC 500 V
Current consumption RS 485-iS coupler (24 V DC), max.	150 mA
Power loss of the module, typically	3 Watts
Status, alarms, diagnostics	
Status display	no
Alarms	None
Diagnostic functions	Yes
• Bus monitoring PROFIBUS DP (primary)	Yellow LED "DP1"
• Bus monitoring PROFIBUS RS 485-iS (secondary)	Yellow LED "DP2"
• Monitoring 24 V power supply	Green LED "ON"
Technical safety notice	
V_{DC}	±4.2 V
I_{SC}	±93 mA
P_0	0.1 Watts
V_{max}	±4.2 V
L_i	0
C_i	0
U_m	AC 250 V
T_a	-25 ... +60 °C

Technical specifications (continued)

Technical specifications - RS 485-iS coupler		
RS 485-IS segment		
permissible cable length on a single line	RS 485-iS	DP Ex i
• 9.6 to 187.5 Kbps	1 000 m	200 m
• 500 kbit/s	400 m	200 m
• 1.5 Mbps	200 m	200 m
Number of PROFIBUS DP nodes that can be connected, max.	31	16
PROFIBUS RS 485-iS bus terminator switch	integrated, can be added	

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Design



ET 200iSP modules can also be installed in stainless steel wall boxes designed to meet more exacting degree of protection requirements. The enclosures are available in various sizes. They comply with degree of protection IP65/66 and can be used in Ex zones 1 and 21 (including hazardous zones 2 and 22).

Depending on requirements, delivery is possible as an empty enclosure with ATEX component certificate or including installations with ATEX device certificate.

Send your request to: cabinets.industry@siemens.com

Selection and ordering data

	Article No.
Stainless steel enclosure IP65/IP66 for SIMATIC ET 200iSP	**6DL2804-**
	● ● ● ● ●
Enclosure	
Ex enclosure, stainless steel 1.4404, IP65/IP66, with mounting plate and PA rail, empty enclosure prepared for installation of ET 200iSP components[1], including ATEX component certificate	**0**
Ex device, IP65/IP66, consisting of stainless steel enclosure 1.4404 with built-in ET 200iSP components[2], including ATEX Ex device certificate	**1**
Ex device, IP65/IP66, consisting of stainless steel enclosure 1.4404 with built-in ET 200iSP and pneumatic components[2], including ATEX Ex device certificate	**2**
Device group	
Device group II, up to zone 1 (including zone 2)	**A**
Device group II, up to zone 1 and zone 21 (including zone 2 and zone 22)	**D**
Enclosure dimensions W × H × D (in mm)	
650 × 450 × 230, for up to 14 ET 200iSP modules (IM/EM), with redundant power supply up to 12 ET 200iSP modules (IM/EM)	**D**
950 × 450 × 230, for up to 24 ET 200iSP modules (IM/EM), with redundant power supply up to 22 ET 200iSP modules (IM/EM)	**E**
Cable entries/number	
M16 cable entries for signals, 3 rows, 39 or 66 units[3], 2 × M32 for supply voltage, 4 × M20 for bus cables	**3**
M20 cable entries for signals, 3 rows, 36 or 57 units[3], 2 × M32 for supply voltage, 4 × M20 for bus cables	**4**
M16 cable entries for signals, 5 rows, 65 or 110 units[3], 2 × M32 for supply voltage, 4 × M20 for bus cables	**5**
M20 cable entries for signals, 5 rows, 60 or 95 units[3], 2 × M32 for supply voltage, 4 × M20 for bus cables	**6**
Degree of protection, material cable entries, material air breather glands	
IP65, cable entries polyamide black, breather glands polyamide	**0**
IP66, cable entries nickel-plated brass, breather glands stainless steel 1.4404	**1**
IP65, cable entries polyamide blue, breather glands polyamide	**2**

1) The supplied certificate is only valid for the empty enclosure.
2) The supplied certificate is valid for the supplied enclosure, including the installed components.
3) Number of cable entries/signals depends on enclosure dimensions

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Technical specifications

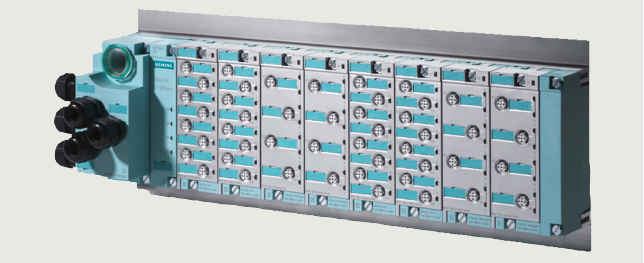
SIMATIC ET 200iSP, stainless steel wall box	
Material	Stainless steel 1.4404 (SS 316L), sheet thickness 1.5 mm
Cover seal	Silicone foam
Range of ambient temperature	• -20 °C ... +xx °C, maximum temperature depending on the installed components • Minus temperatures down to -40 °C when heater installed. This takes up 2 slots for ET 200iSP modules. The heater (6DL9910-8AA) must be ordered separately.
Other special features	• With breather glands • Door opens upwards with gas compression springs • With sealing plug for unused cable entries • With suspension for wall mounting

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Overview



SIMATIC ET 200pro video



- SIMATIC ET 200pro distributed I/O system with degree of protection IP65/67 for cabinet-free use at the machine
- Small, multifunctional complete solution: Digital inputs/outputs, fail-safe modules, motor starters up to 5.5 kW, etc.
- Communication over PROFIBUS or PROFINET
- Mixed arrangement of fail-safe and standard modules in the same station
- Freely selectable connection technology: M12 7/8", M12 M12-L, direct, ECOFAST, push pull (CU, FO)
- Power module for easy implementation of load groups
- Module replacement during operation (hot swap)
- Easy installation as well as permanent wiring
- Transfer rate for PROFIBUS DP up to 12 Mbps
- Extensive diagnostics: module-specific or channel-specific
- Intelligent motor starters for starting and protection of motors and loads up to 5.5 kW
  - Versions: direct and reversing starters - Standard and High Feature
- Safety motor starters
- Fail-safe modules with safety-related signal processing according to PROFIsafe
- Frequency converters
- RFID communications modules
- Pneumatic interface modules
- IO-Link master

Technical specifications

General technical specifications	
Electronic modules	• Digital inputs/outputs • Analog inputs • Analog outputs
Connections	M12 and M8 round connector with standard assignment for actuator/sensor
Transmission rate, max.	12 Mbps (PROFIBUS DP), 100 Mbps (PROFINET IO)
Supply voltage	24 V DC
Current consumption of ET 200pro (internal and sensor supply, non-switched voltage), up to 55 °C, max.	≤ 5 A
Load current for ET 200pro per incoming supply (IM, PM, switched voltage), up to 55 °C, max.	10 A
For overall configuration with looping through (multiple ET 200pros), up to 55 °C, max.	16 A (with terminal module, directly)
Degree of protection	IP65/66/IP67 for interface, digital and analog modules
Material	Thermoplastic (reinforced with glass fiber)
Ambient conditions	
Temperature	From -25 °C/0 °C to +55 °C
Relative humidity	From 5 to 100%
Air pressure	From 795 to 1080 hPa
Mechanical stress	
• Vibration	Vibration test according to IEC 60068, Part 2-6 (sinusoidal) • Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules • 2 g motor starters
• Shock	• Shock test according to IEC 680068 Part 2-27, half-sine, 30 g, 18 ms duration for interface, digital and analog modules • 15 g, 11 ms duration for motor starters
Approvals	UL, CSA or cULus

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Overview



Interface modules for communication between ET 200pro and higher-level master via PROFIBUS DP.

Selection and ordering data

IM154-1 interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP.	**6ES7154-1AA01-0AB0**
IM154-2 DP High Feature interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP; supports PROFIsafe.	**6ES7154-2AA01-0AB0**
Accessories	
CM IM DP ECOFAST connection module For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections.	**6ES7194-4AA00-0AA0**
CM IM DP direct connection module For connecting PROFIBUS DP and the 24 V power supply directly to PROFIBUS interface modules, up to six M20 cable glands.	**6ES7194-4AC00-0AA0**
CM IM DP M12, 7/8" connection module For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 x M12 and 2 x 7/8".	**6ES7194-4AD00-0AA0**
Accessories for CM IM DP ECOFAST	
PROFIBUS ECOFAST hybrid cable, preassembled With 2 ECOFAST connectors, trailable cable with 2 x Cu 0.64 mm²and 4 x Cu 1.5 mm², in various lengths:	
1.5 m	**6XV1830-7BH15**
3.0 m	**6XV1830-7BH30**
5.0 m	**6XV1830-7BH50**
10 m	**6XV1830-7BN10**
15 m	**6XV1830-7BN15**
20 m	**6XV1830-7BN20**
PROFIBUS ECOFAST hybrid cable GP, preassembled With 2 ECOFAST connectors, trailable cable with 2 x Cu 0.64 mm²and 4 x Cu 1.5 mm², in various lengths:	
1.5 m	**6XV1860-3PH15**
3.0 m	**6XV1860-3PH30**
5.0 m	**6XV1860-3PH50**
10 m	**6XV1860-3PN10**
15 m	**6XV1860-3PN15**
20 m	**6XV1860-3PN20**
PROFIBUS ECOFAST hybrid cable, unassembled Trailable cable with 2 x Cu 0.64 mm²and 4 x Cu 1.5 mm², sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-7AH10**
PROFIBUS ECOFAST hybrid connector 180 ECOFAST Cu, 2 x Cu, 4 x 1.5 mm², HANBRID connector	
• With pin insert, 5-pack	**6GK1905-0CA00**
• With socket insert, 5-pack	**6GK1905-0CB00**
PROFIBUS ECOFAST hybrid connector angular ECOFAST Cu, 2 x Cu, 4 x 1.5 mm², HANBRID connector	
• With pin insert, 5-pack	**6GK1905-0CC00**
• With socket insert, 5-pack	**6GK1905-0CD00**
Accessories for CM IM DP direct	

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Selection and ordering data (continued)

PROFIBUS trailing cable Max. acceleration 4 m/s², at least 3000000 bending cycles, bending radius at least 60 mm, 2-wire shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	**6XV1830-3EH10**
PROFIBUS FC food bus cable With PE sheath for use in the food, beverages and tobacco industries, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-0GH10**
PROFIBUS FC robust bus cable With PUR sheath for use in environments subject to harsh chemicals and extreme mechanical stress, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-0JH10**
Power cable 5-wire, 5 x 1.5 mm², trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	**6XV1830-8AH10**
Accessories for CM IM DP M12, 7/8"	
PROFIBUS M12 connecting cable Preassembled with two M12 plugs, 5-pin, in various lengths:	
1.5 m	**6XV1830-3DH15**
2.0 m	**6XV1830-3DH20**
3.0 m	**6XV1830-3DH30**
5.0 m	**6XV1830-3DH50**
10 m	**6XV1830-3DN10**
15 m	**6XV1830-3DN15**
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors, 5-pin, in various lengths:	
1.5 m	**6XV1822-5BH15**
2.0 m	**6XV1822-5BH20**
3.0 m	**6XV1822-5BH30**
5.0 m	**6XV1822-5BH50**
10 m	**6XV1822-5BN10**
15 m	**6XV1822-5BN15**
M12 connection plug For ET 200eco, with axial cable outlet	
• With pin insert, 5-pack	**6GK1905-0EA00**
• With socket insert, 5-pack	**6GK1905-0EB00**
PROFIBUS M12 bus termination connector With pin insert.	**6GK1905-0EC00**
7/8" connection plug For ET 200eco, with axial cable outlet	
• With pin insert, 5-pack	**6GK1905-0FA00**
• With socket insert, 5-pack	**6GK1905-0FB00**
M12 sealing cap For protection of unused M12 connections with ET 200pro.	**3RX9802-0AA00**
7/8" sealing cap For protection of unused 7/8" connections with ET 200pro; 10 units per packing unit	**6ES7194-3JA00-0AA0**
General accessories	
ET 200pro module rack	
• Narrow, for interface, electronics and power modules	
- 500 mm	**6ES7194-4GA00-0AA0**
- 1000 mm	**6ES7194-4GA60-0AA0**
- 2000 mm, can be cut to length	**6ES7194-4GA20-0AA0**
• Compact, for interface, electronics and power modules	
- 500 mm	**6ES7194-4GC70-0AA0**
- 1000 mm	**6ES7194-4GC60-0AA0**
- 2000 mm, can be cut to length	**6ES7194-4GC20-0AA0**
• Wide, for interface, electronics, power modules and motor starters	
- 500 mm	**6ES7194-4GB00-0AA0**
- 1000 mm	**6ES7194-4GB60-0AA0**
- 2000 mm, can be cut to length	**6ES7194-4GB20-0AA0**
• Wide, for I/O modules and motor starters	
- 500 mm	**6ES7194-4GD00-0AA0**
- 1000 mm	**6ES7194-4GD10-0AA0**
- 2000 mm	**6ES7194-4GD20-0AA0**
Spare fuse 12.5 A quick-response, for interface and power modules, 10 units per packing unit.	**6ES7194-4HB00-0AA0**
PROFIBUS FastConnect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	**6XV1830-0EH10**
PROFIBUS hybrid standard cable GP Standard PROFIBUS hybrid cable with 2 power cables (1.5 mm2) for supplying data and power for ET 200pro.	**6XV1860-2R**
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Technical specifications

Article number	6ES7154-1AA01-0AB0 ET 200pro, IM 154-1 DP	6ES7154-2AA01-0AB0 ET 200pro, IM154-2 DP HF
General information		
Product type designation	IM 154-1 DP	IM 154-2 DP HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; over exchangeable fuses	Yes; over exchangeable fuses
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	200 mA	200 mA
Address area		
Addressing volume		
• Inputs	244 byte	244 byte
• Outputs	244 byte	244 byte
Interfaces		
Interfaces/bus type	PROFIBUS DP	PROFIBUS DP
Interface types		
RS 485		
• Transmission rate, max.	12 Mbit/s	12 Mbit/s
• automatic detection of transmission rate	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	No	No
PROFIsafe	No	Yes
PROFIBUS	Yes	Yes
EtherNet/IP	No	No
PROFIBUS DP		
- Services		
- SYNC capability	Yes	Yes
- FREEZE capability	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes	Yes
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnostics indication LED		
• For load voltage monitoring	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Dimensions		
Width	90 mm	90 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	375 g

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Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

Selection and ordering data

IM 154-3 PN High Feature interface module For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFIsafe. Connection module 6ES7194-4AK00-0AA0 must be ordered separately.	**6ES7154-3AB00-0AB0**
IM 154-4 PN High Feature interface module For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFIsafe. Order connection module 6ES7194-4A .00-0AA0 separately.	**6ES7154-4AB10-0AB0**
Accessories	
Connection modules for IM 154-3 PN High Feature	
• **CM IM PN M12 connection module 7/8" S** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"	**6ES7194-4AK00-0AA0**
• **CM IM PN M12 connection module M12-L S** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2x M12-D and 2x M12-L	**6ES7194-4AL00-0AA0**
Connection modules for IM 154-4 PN High Feature	
• **CM IM PN M12 connection module, 7/8"** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"	**6ES7194-4AJ00-0AA0**
• **CM IM PN 2xRJ45 connection module** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector	**6ES7194-4AF00-0AA0**
• **CM IM PN 2xSCRJ FO connection module** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector	**6ES7194-4AG00-0AA0**
M12 sealing cap For protection of unused M12 connections with ET 200pro.	**3RX9802-0AA00**
IE M12 connecting cables Preassembled with two M12 plugs, up to 85 m, in various lengths:	
0.3 m	**6XV1870-8AE30**
0.5 m	**6XV1870-8AE50**
1.0 m	**6XV1870-8AH10**
1.5 m	**6XV1870-8AH15**
2.0 m	**6XV1870-8AH20**
3.0 m	**6XV1870-8AH30**
5.0 m	**6XV1870-8AH50**
10 m	**6XV1870-8AN10**
15 m	**6XV1870-8AN15**
20 m	**6XV1870-8AN20**
30 m	**6XV1870-8AN30**
40 m	**6XV1870-8AN40**
50 m	**6XV1870-8AN50**
7/8" sealing caps 1 pack = 10 units	**6ES7194-3JA00-0AA0**
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors, 5-pin, up to 50 m, in various lengths:	

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Selection and ordering data (continued)

1.5 m	**6XV1822-5BH15**
2.0 m	**6XV1822-5BH20**
3.0 m	**6XV1822-5BH30**
5.0 m	**6XV1822-5BH50**
10 m	**6XV1822-5BN10**
15 m	**6XV1822-5BN15**
Power cable 5-wire, 5 x 1.5 mm², trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	**6XV1830-8AH10**
7/8" connection plug For ET 200eco, with axial cable outlet	
• With pin insert, 5-pack	**6GK1905-0FA00**
• With socket insert, 5-pack	**6GK1905-0FB00**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP standard cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1840-2AH10**
• **IE FC TP trailing cable 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1840-3AH10**
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1870-2F**
• **IE FC TP marine cable 2 x 2**; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	**6XV1840-4AH10**
IE RJ45 plug PRO RJ45 plug connector in degree of protection IP65/IP67 for on-site assembly, plastic enclosure, insulation displacement connection system, for SCALANCE X-200IRT PRO and ET 200pro: 1 pack = 1 unit.	**6GK1901-1BB10-6AA0**
IE SC RJ POF plug PRO SC RJ plug connector for POF fibers in degree of protection IP65/IP67, for on-site assembly, plastic enclosure, for SCALANCE X-200IRT PRO and ET 200pro 1 pack = 1 unit	**6GK1900-0MB00-6AA0**
IE SC RJ PCF plug PRO SC RJ plug connector for PCF fibers in degree of protection IP65/IP67, for on-site assembly, plastic enclosure, for SCALANCE X-200IRT PRO 1 pack = 1 unit.	**6GK1900-0NB00-6AA0**
Power plug PRO 5-pin power plug connector for 2 x 24 V power supply in degree of protection IP65/67, for on-site assembly, plastic enclosure, for SCALANCE X-200IRT and ET 200pro 1 pack = 1 unit.	**6GK1907-0AB11-6AA0**
IE panel feedthrough Control cabinet bushing for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20)	
• 1 pack = 5 units	**6GK1901-0DM20-2AA5**
Push-pull connection plug For 1L+/ 2L+, unassembled	**6GK1907-0AB11-6AA0**
Cover caps for push-pull RJ45 sockets 5 items per pack	**6ES7194-4JD50-0AA0**

Selection and ordering data (continued)

Cover caps for push-pull sockets power (1L+, 2L+) 5 units	**6ES7194-4JA50-0AA0**
General accessories	
ET 200pro module rack	
• Narrow, for interface, electronics and power modules	
- 500 mm	**6ES7194-4GA00-0AA0**
- 1000 mm	**6ES7194-4GA60-0AA0**
- 2000 mm, can be cut to length	**6ES7194-4GA20-0AA0**
• Compact, for interface, electronics and power modules	
- 500 mm	**6ES7194-4GC70-0AA0**
- 1000 mm	**6ES7194-4GC60-0AA0**
- 2000 mm, can be cut to length	**6ES7194-4GC20-0AA0**
• Wide, for interface, electronics, power modules and motor starters	
- 500 mm	**6ES7194-4GB00-0AA0**
- 1000 mm	**6ES7194-4GB60-0AA0**
- 2000 mm, can be cut to length	**6ES7194-4GB20-0AA0**
• Wide, for I/O modules and motor starters	
- 500 mm	**6ES7194-4GD00-0AA0**
- 1000 mm	**6ES7194-4GD10-0AA0**
- 2000 mm	**6ES7194-4GD20-0AA0**
Spare fuse 12.5 A quick-response, for interface and power modules, 10 units per packaging unit.	**6ES7194-4HB00-0AA0**
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Technical specifications

Article number	6ES7154-3AB00-0AB0 ET 200pro, IM 154-3 PN HF	6ES7154-4AB10-0AB0 ET 200pro, IM 154-4 PN HF
General information		
Product type designation	IM 154-3 PN HF	IM 154-4 PN HF
Product function		
• IRT	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	300 mA	400 mA; Dependent on terminal module, typ. maximum value for FO connection method, full load on RWB and 20.4 V input voltage
Address area		
Addressing volume		
• Inputs	256 byte	256 byte
• Outputs	256 byte	256 byte
Interfaces		
Interfaces/bus type	PROFINET IO	PROFINET IO
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	Yes	Yes
PROFIBUS	No	No
EtherNet/IP	No	No
Protocols (Ethernet)		
• SNMP	Yes	Yes
• LLDP	Yes	
• ping	Yes	Yes
• ARP	Yes	Yes
Redundancy mode		
- Media redundancy		
- MRP	Yes	Yes
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnostics indication LED		
• MAINT LED	Yes	Yes
• LINK LED	Yes	Yes
• RX/TX LED	Yes	Yes
• For load voltage monitoring	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C

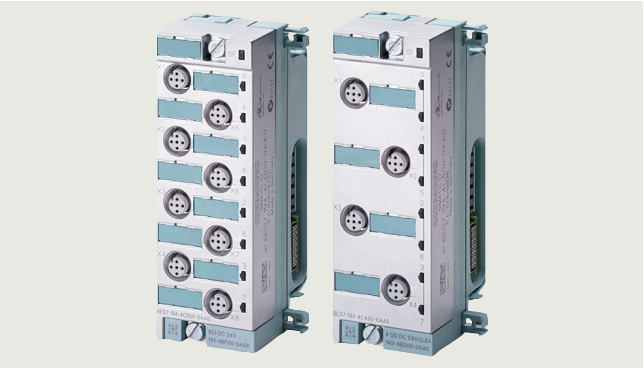
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Technical specifications (continued)

Article number	6ES7154-3AB00-0AB0 ET 200pro, IM 154-3 PN HF	6ES7154-4AB10-0AB0 ET 200pro, IM 154-4 PN HF
Dimensions		
Width	90 mm	135 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	490 g

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Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
  - Standard modules with module-specific diagnostics
  - High Feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8 DI and 8 DO module by selecting CM IO 4 x M12 or CM IO 8 x M12
- IO connection modules are available in metal and plastic versions

Selection and ordering data

8 DI digital input module 24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7141-4BF00-0AA0**
8 DI High Feature digital input module 24 V DC, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7141-4BF00-0AB0**
16 DI digital input module 24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES7194-4CB50-0AA0 must be ordered separately	**6ES7141-4BH00-0AA0**
4 DQ digital output module 24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7142-4BD00-0AA0**
4 DQ High Feature digital output module 24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7142-4BD00-0AB0**
8 DQ digital output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7142-4BF00-0AA0**
4 DI/4 DQ digital input and output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7143-4BF50-0AA0**
4 DIQ/4 DQ digital input and output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7143-4BF00-0AA0**
Accessories	
CM IO 4 x M12 connection module 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	**6ES7194-4CA00-0AA0**
CM IO 4 x M12 inverse connection module 4 M12 sockets for connection of digital actuators to ET 200pro (4 DQ and 4 DQ HF); 2 x M12 single assignment, 2 x M12 double assignment	**6ES7194-4CA50-0AA0**
CM IO 4 x M12 P connection module 4 M12 sockets for connecting digital sensors/actuators to ET 200pro; plastic version	**6ES7194-4CA10-0AA0**
CM IO 8 x M12 connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	**6ES7194-4CB00-0AA0**
CM IO 8 x M12 P connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro; plastic version	**6ES7194-4CB10-0AA0**
CM IO 8 x M12D connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	**6ES7194-4CB50-0AA0**
CM IO 8 x M8 connection module 8 sockets M8 for connection of digital sensors or actuators to ET 200pro	**6ES7194-4EB00-0AA0**
CM IO 2 x M12 connection module 2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DQ, 24 V DC/0.5 A	**6ES7194-4FB00-0AA0**

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Selection and ordering data (continued)

CM IO 1 x M23 connection module 1 M23 socket; for use with: EM 8 DI, 24 V DC and 8 DQ, 24 V DC/0.5 A	**6ES7194-4FA00-0AA0**
Module identification labels For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	**6ES7194-4HA00-0AA0**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**
M12 Y circular connector For double connection of sensors via a single cable, 5-pin; cannot be used for F-DI 4/8	**6ES7194-1KA01-0XA0**
M12 Y-cable For double connection of I/O by means of a single cable to ET 200, 5-pin	**6ES7194-6KA00-0XA0**
M8 sealing cap For IP67 modules	**3RK1901-1PN00**

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Technical specifications

Article number	6ES7141-4BF00-0AA0 ET 200pro, EM 8DI 24V DC	6ES7141-4BF00-0AB0 ET 200pro, EM 8DI 24V DC HF	6ES7141-4BH00-0AA0 ET 200pro, EM 16DI DC 24V
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current			
from supply voltage 1L+, max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	20 mA	20 mA
Encoder supply			
Number of outputs	8	8	8
Short-circuit protection	Yes; per module, electronic	Yes; per channel, electronic	Yes; per module, electronic
Output current			
• up to 55 °C, max.	1 A	1 A	1 A
Digital inputs			
Number of digital inputs	8	8	16
Sourcing/sinking input	P-reading	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	No	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	Yes	
Number of simultaneously controllable inputs			
- all mounting positions			
- up to 55 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	7 mA	7 mA	4 mA
Input delay (for rated value of input voltage)			
- for standard inputs			
- parameterizable	No	Yes	No
Cable length			
• unshielded, max.	30 m	30 m	30 m
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes; channel by channel, parameterizable	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Hardware interrupt		Yes	
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Wire break		Yes; Monitoring, I < 0.3 mA; per channel	
• short-circuit	Yes; Sensor supply to M; module by module	Yes; channel by channel	Yes; Sensor supply to M; module by module
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes; Per channel	Yes; Per channel	Yes; Per channel
Potential separation			
between backplane bus and all other circuit components	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7141-4BF00-0AA0 ET 200pro, EM 8DI 24V DC	6ES7141-4BF00-0AB0 ET 200pro, EM 8DI 24V DC HF	6ES7141-4BH00-0AA0 ET 200pro, EM 16DI DC 24V
Potential separation digital inputs			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
Dimensions			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
Weights			
Weight, approx.	140 g	140 g	140 g

Article number	6ES7142-4BD00-0AA0 ET 200pro, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET 200pro, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET 200pro, EM 8DO DC24V/0.5A
Supply voltage			
Load voltage 2L+			
• Rated value (DC)	24 V	24 V	24 V
• Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; against destruction; load increasing
Input current			
from load voltage 2L+ (without load), max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA	30 mA
Digital outputs			
Number of digital outputs	4	4	8
Current-sourcing	Yes	Yes	Yes
output type acc. to IEC 61131, type 0.5			Yes
output type acc. to IEC 61131, type 2	Yes	Yes	
Short-circuit protection	Yes	Yes	Yes
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	2L+ (-47 V)
Controlling a digital input	Yes	Yes	Yes; Isolation between 1L+ and 2L+ is no longer provided, as 1M and 2M are jumpered
Switching capacity of the outputs			
• on lamp load, max.	10 W	10 W	5 W
Load resistance range			
• lower limit	12 Ω	12 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
Output voltage			
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)	2L+ (-0,8 V)
Output current			
• for signal "1" rated value	2 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Parallel switching of two outputs			
• for uprating	No	No	No
• for redundant control of a load	Yes	Yes	Yes
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
Total current of the outputs (per group)			
- all mounting positions			
- up to 55 °C, max.	4 A	4 A	4 A
Cable length			
• shielded, max.	30 m	30 m	30 m
• unshielded, max.	30 m	30 m	30 m

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Technical specifications (continued)

Article number	6ES7142-4BD00-0AA0 ET 200pro, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET 200pro, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET 200pro, EM 8DO DC24V/0.5A
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable		Yes	
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Wire break		Yes; channel by channel	
• short-circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; channel by channel	Yes; Short-circuit of outputs to ground; module by module
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes
• Channel fault indicator F (red)		Yes	
Potential separation			
between backplane bus and all other circuit components	Yes	Yes	Yes
Potential separation digital outputs			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2
Dimensions			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
Weights			
Weight, approx.	140 g	140 g	140 g

Article number	6ES7143-4BF50-0AA0 ET 200pro, EM 4DI / 4DO DC 24V, 0.5A	6ES7143-4BF00-0AA0 ET 200pro, EM 4 DIO / 4 DO DC 24V, 0.5A
Supply voltage		
Rated value (DC)		24 V
Reverse polarity protection		Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes; against destruction; load increasing
Input current		
from supply voltage 1L+, max.		20 mA
from load voltage 2L+ (without load), max.	20 mA	20 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA
Encoder supply		
Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic
Output current		
• up to 55 °C, max.	1 A	1 A
Digital inputs		
Number of digital inputs	4	4; 4 DIOs can be parameterized

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Technical specifications (continued)

Article number	6ES7143-4BF50-0AA0 ET 200pro, EM 4DI / 4DO DC 24V, 0.5A	6ES7143-4BF00-0AA0 ET 200pro, EM 4 DIO / 4 DO DC 24V, 0.5A
Sourcing/sinking input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 55 °C, max.		4
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	7 mA	7 mA
Cable length		
• unshielded, max.	30 m	30 m
Digital outputs		
Number of digital outputs	4	8; 4 DO fixed, 4 DIO parameterizable
• in groups of		4; 2 load groups for 4 outputs each
Current-sourcing	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes	Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	Typ. (2L+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ
Output voltage		
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
Total current of the outputs (per group)		
- all mounting positions		
- up to 55 °C, max.	2 A	2 A
Cable length		
• unshielded, max.	30 m	30 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Diagnostic information readable	Yes	Yes
• short-circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; Short-circuit of outputs to ground; module by module

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Technical specifications (continued)

Article number	6ES7143-4BF50-0AA0 ET 200pro, EM 4DI / 4DO DC 24V, 0.5A	6ES7143-4BF00-0AA0 ET 200pro, EM 4 DIO / 4 DO DC 24V, 0.5A
Diagnostics indication LED		
• Group error SF (red)		Yes
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
Potential separation		
between backplane bus and all other circuit components	Yes	Yes
Potential separation digital inputs		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
Potential separation digital outputs		
• between the channels	No	
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules		Yes
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1		PL d
• Category according to ISO 13849-1		Cat. 3
• SIL acc. to IEC 62061		SIL 2
Dimensions		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	140 g	140 g

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Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostic functionality, limit values and substitute values

Selection and ordering data

4AI U analog input module High Feature, ±10 V; ±5 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7144-4FF01-0AB0**
4AI I analog input module High Feature, ±20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7144-4GF01-0AB0**
4AI RTD analog input module High Feature; resistances: 150, 300, 600 and 3000 Ohm; resistance thermometer: Pt100, 200, 500, 1000, Ni100, 120, 200, 500 and 1000; channel-specific diagnostics, incl. bus module. Connection module must be ordered separately	**6ES7144-4JF00-0AB0**
4AI TC analog input module High Feature; thermocouples: Type B, E, J, K, L, N, R, S, T; voltage measurement ±80 mV; channel diagnostics, including bus module. Connection module must be ordered separately	**6ES7144-4PF00-0AB0**
4AO U analog output module High Feature, ±10 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7145-4FF00-0AB0**
4AO I analog output module High Feature, ±20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7145-4GF00-0AB0**
Accessories	
CM IO 4 x M12 connection module 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	**6ES7194-4CA00-0AA0**
M12 compensation connectors With integral Pt100 for cold junction compensation when connecting thermocouples	**6ES7194-4AB00-0AA0**
Module identification labels For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	**6ES7194-4HA00-0AA0**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**

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Technical specifications

Article number	6ES7144-4FF01-0AB0	6ES7144-4GF01-0AB0	6ES7144-4JF00-0AB0	6ES7144-4PF00-0AB0
	ET 200pro, EM 4AI-U HF	ET 200pro, EM 4AI-I HF	ET 200pro, EM 4 AI-RTD HF	ET 200pro, EM 4 AI-TC HF
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction	Yes; against destruction	Yes; against destruction
Input current				
from supply voltage 1L+, max.	40 mA; Typical	40 mA; Typical	27 mA; Typical	34 mA; Typical
from backplane bus 3.3 V DC, max.	12 mA; Typical	12 mA; Typical	10 mA; Typical	20 mA; Typical
Encoder supply				
Number of outputs	4	4		
Short-circuit protection	Yes; per module, electronic to frame	Yes; per module, electronic to frame		
Output current				
• up to 55 °C, max.	1 A	1 A		
Analog inputs				
Number of analog inputs	4	4	4	4
permissible input voltage for voltage input (destruction limit), max.	35 V			20 V
permissible input current for current input (destruction limit), max.		40 mA		
Constant measurement current for resistance-type transmitter, typ.			1.25 mA; 1.25 / 0.5 mA depending on measuring range	
Cycle time (all channels) max.	5 ms	10 ms	83 ms; 83 ms at 50 Hz; 69 ms at 60 Hz	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable			Yes; Degrees Celsius/degrees Fahrenheit	Yes; °C/°F/K
Input ranges (rated values), voltages				
• 0 to +10 V	Yes			
• 1 V to 5 V	Yes			
• -10 V to +10 V	Yes			
• -5 V to +5 V	Yes			
• -80 mV to +80 mV				Yes
Input ranges (rated values), currents				
• 0 to 20 mA		Yes		
• -20 mA to +20 mA		Yes		
• 4 mA to 20 mA		Yes		
Input ranges (rated values), thermocouples				
• type B				Yes
• Type E				Yes
• Type J				Yes
• Type K				Yes
• Type L				Yes
• Type N				Yes
• Type R				Yes
• Type S				Yes
• Type T				Yes
Input ranges (rated values), resistance thermometer				
• Cu 10			No	
• Ni 100			Yes	
• Ni 1000			Yes	
• Ni 120			Yes	
• Ni 200			Yes	
• Ni 500			Yes	
• Pt 100			Yes	
• Pt 1000			Yes	

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Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
• Pt 200			Yes	
• Pt 500			Yes	
Input ranges (rated values), resistors				
• 0 to 150 ohms			Yes	
• 0 to 300 ohms			Yes	
• 0 to 600 ohms			Yes	
• 0 to 3000 ohms			Yes	
• PTC			Yes	
Thermocouple (TC)				
- Temperature compensation				
- internal temperature compensation				Yes
- external temperature compensation with compensations socket				Yes
Characteristic linearization				
• Parameterizable			Yes	
- for resistance thermometer			Ptxxx, Nixxx	
Cable length				
• shielded, max.	30 m	30 m	30 m	30 m
Analog value generation for the inputs				
Measurement principle	integrating	integrating	integrating	integrating
Integration and conversion time/resolution per channel				
• Resolution with overrange (bit including sign), max.	15 bit; 15 bit + sign at ±10 V, at ±5 V; 15 bit at 0 V to 10 V, at 1 V to 5 V	15 bit; 15 bit + sign at ±10 V, at ±5 V; 15 bit at 0 V to 10 V, at 1 V to 5 V	15 bit; at 150, 300, 600 und 3 000 ohms; otherwise 15 bits + sign	15 bit; + sign
• Integration time (ms)			20 / 16,667	2,5 / 16,67 / 20 / 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	16,67 / 50 / 60 / 3 600	16,67 / 50 / 60 / 3 600	50 / 60 Hz	10 / 50 / 60 / 400 Hz
• Conversion time (per channel)			20.625 ms; 20.625 ms at 50 Hz; 17.25 ms at 60 Hz	4.7/19/22/102 ms
Smoothing of measured values				
• Parameterizable	Yes	Yes	Yes	Yes
Encoder				
Connection of signal encoders				
• for voltage measurement	Yes			Yes
• for current measurement as 2-wire transducer		Yes		
• for current measurement as 4-wire transducer		Yes		
• for resistance measurement with two-wire connection			Yes; Line resistances are also measured	
• for resistance measurement with three-wire connection			Yes	
• for resistance measurement with four-wire connection			Yes	
Errors/accuracies				
Linearity error (relative to input range), (+/-)	0.0075 %	0.0075 %	0.05 %	0.01 %
Temperature error (relative to input range), (+/-)	0.00075 %/K	0.00075 %/K	0.002 %/K	0.0004 %/K; Positive temperature
Crosstalk between the inputs, min.	-70 dB	-70 dB	-50 dB	-90 dB; max.
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.004 %	0.004 %	0.015 %	0.01 %
Operational error limit in overall temperature range				
• Voltage, relative to input range, (+/-)	0.1 %			0.12 %; Positive temperature
• Current, relative to input range, (+/-)		0.1 %		

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Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
• Resistance thermometer, relative to input range, (+/-)			0.175 %	
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)	0.075 %			0.1 %
• Current, relative to input range, (+/-)		0.075 %		
• Resistance thermometer, relative to input range, (+/-)			0.125 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.			50 dB	42 dB
• Common mode interference (USS < 2.5 V), min.			70 dB; Interference voltage < 5 V	85 dB; Interference voltage < 10 V
Interference voltage suppression for f = n x (f1 +/- 0.5 %), f1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB	60 dB		
• Common mode interference (USS < 2.5 V), min.	80 dB; Interference voltage < 10 V	80 dB; Interference voltage < 5 V		
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; (limit value alarm), can be parameterized for channel 0	Yes; (limit value alarm), can be parameterized for channel 0	No	No
Diagnoses				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire break	Yes; at 1 to 5 V	Yes; at 4 to 20 mA	Yes	Yes
• short-circuit	Yes; at 1 to 5 V	Yes; at 4 to 20 mA		
• Overflow/Underflow			Yes	Yes
Diagnostics indication LED				
• Group error SF (red)	Yes	Yes	Yes	Yes
Potential separation				
Potential separation analog inputs				
• between the channels	No	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9				Yes; Based on AMS 2750 E
Dimensions				
Width	45 mm	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm	130 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	150 g	150 g	150 g	150 g

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Technical specifications (continued)

Article number	6ES7145-4FF00-0AB0 ET 200pro, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET 200pro, EM 4 AO-I HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	65 mA	110 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA
Actuator supply		
Number of outputs	4	4
Short-circuit protection	Yes; per module	Yes; per module
Output current		
• up to 55 °C, max.	1 A	1 A
Analog outputs		
Number of analog outputs	4	4
Voltage output, short-circuit protection	Yes; per channel, electronic to chassis	Yes; per module, electronic to frame
Voltage output, short-circuit current, max.	50 mA	
Current output, no-load voltage, max.		16 V
Cycle time (all channels) max.	3 ms	3 ms
Output ranges, voltage		
• 0 to 10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
Output ranges, current		
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes
Connection of actuators		
• for voltage output two-wire connection	Yes	
• for voltage output four-wire connection	Yes	
• for current output two-wire connection		Yes
• for current output four-wire connection		Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 000 Ω	
• with voltage outputs, capacitive load, max.	1 µF	
• with current outputs, max.		600 Ω
• with current outputs, inductive load, max.		1 mH
Cable length		
• shielded, max.	30 m	30 m
Analog value generation for the outputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; at -10 to +10 V; 14 bit at 1 to 5 V; 15 bit at 0 to 10 V	15 bit; at ±20 mA; 14 bit at 0 to 20 mA; 15 bit at 4 to 20 mA
• Conversion time (per channel)	0.7 ms	0.7 ms
Settling time		
• for resistive load	0.1 ms	0.1 ms
• for capacitive load	6 ms	
• for inductive load		1 ms
Errors/accuracies		
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %	0.1 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %
Operational error limit in overall temperature range		
• Voltage, relative to output range, (+/-)	0.2 %	
• Current, relative to output range, (+/-)		0.2 %

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Technical specifications (continued)

Article number	6ES7145-4FF00-0AB0 ET 200pro, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET 200pro, EM 4 AO-I HF
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output range, (+/-)	0.15 %	
• Current, relative to output range, (+/-)		0.15 %
Interrupts/diagnostics/status information		
Diagnostics function		Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Wire break	No	Yes; per channel, not in zero range
• short-circuit	Yes; per channel, not in zero range	No
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
Potential separation		
Potential separation analog outputs		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	150 g	150 g

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Overview



- 2-channel position detection module for ET 200pro, incl. bus module
- For connecting gray and dual-coded SSI absolute encoders to ET 200pro
- SSI interface with clock and data for RS422 differential signals
- 24 V encoder supply, short-circuit-proof
- Parameterizable input filters for suppressing interferences at encoder inputs
- Supports SSI absolute encoder with a frame length of 10 to 40 bits, of which up to 25 bits position value
- Width 45 mm

Selection and ordering data

SIMATIC DP, electronic module for ET 200pro EM 2xSSI Position detection for 2 SSI absolute encoders incl. bus module, SSI CM connection module 6ES7194-4CC00-0AA0 must be ordered separately	**6ES7147-4BB00-0AA0**
Accessories	
SIMATIC DP SSI CM connection module For technology module ET 200pro EM 2xSSI 2xM12	**6ES7194-4CC00-0AA0**
AS-Interface accessory M12 cover For IP67 modules, 15 mm outer diameter, with O-ring	**3RK1901-1KA00**
AS-Interface accessory M12 cover For IP67 modules, tamper-proof version, 15 mm outer diameter, with O-ring	**3RK1901-1KA01**
AS-Interface accessory M12 cover For IP67 modules, 12 mm outer diameter, without O-ring	**3RX9802-0AA00**
Device identification labels, for SIRIUS devices 20x7 mm, titanium gray, package contents: 17 sheets with 20 labels each	**3RT2900-1SB20**
SIMATIC DP, module labels for ET 200 PRO For color-coding of the IO connection modules; Pack of 100 20x7 labels in the colors red, green, blue, white, yellow	**6ES7194-4HA00-0AA0**
SIMATIC DP, slim module rack for ET 200 PRO I/O modules Length 500 mm	**6ES7194-4GA00-0AA0**
SIMATIC DP, slim module rack for ET 200 PRO I/O modules Sold by the meter for self-configuration, length 2000 mm	**6ES7194-4GA20-0AA0**
SIMATIC DP, slim module rack for ET 200 PRO I/O modules Length 1000 mm, new drilling pattern	**6ES7194-4GA60-0AA0**
SIMATIC DP, module rack wide version for I/O modules and motor starter ET 200 PRO Length 500 mm	**6ES7194-4GB00-0AA0**
SIMATIC DP, module rack wide version for I/O modules and motor starter ET 200 PRO Sold by the meter for self-configuration, length 2000 mm	**6ES7194-4GB20-0AA0**
SIMATIC DP, module rack wide version for I/O modules and motor starter ET 200 PRO Length 1000 mm, new drilling pattern	**6ES7194-4GB60-0AA0**
SIMATIC DP, compact module rack for ET 200 PRO I/O modules Sold by the meter for self-configuration, length 2000 mm	**6ES7194-4GC20-0AA0**
SIMATIC DP, compact module rack for ET 200 PRO I/O modules Length 1000 mm, new drilling pattern	**6ES7194-4GC60-0AA0**
SIMATIC DP, compact module rack for ET 200 PRO I/O modules Length 500 mm, new drilling pattern	**6ES7194-4GC70-0AA0**
SIMATIC DP, module rack compact, wide version for I/O modules and motor starter ET 200 PRO Length 500 mm	**6ES7194-4GD00-0AA0**
SIMATIC DP, module rack compact, wide version for I/O modules and motor starter ET 200 PRO Length 1000 mm	**6ES7194-4GD10-0AA0**
SIMATIC DP, module rack compact wide version for I/O modules and motor starter ET 200 PRO Sold by the meter for self-configuration, length 2000 mm	**6ES7194-4GD20-0AA0**

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Technical specifications

Article number	6ES7147-4BB00-0AA0 ET 200pro EM 2 SSI
General information	
Product function	
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18.0.1.4 or higher
• PROFINET from GSD version/GSD revision	GSDML V2.35
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
from supply voltage 1L+, max.	30 mA; without output current for the 24 V Encoder supply
from backplane bus 3.3 V DC, max.	20 mA
Encoder supply	
Number of outputs	2
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	150 mA; Per channel
Encoder	
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	30 m; Up to 500 kHz
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• RS 422	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Wire break	Yes
• short-circuit	Yes; Encoder supply to M, channel by channel
• Telegram error at SSI encoder	Yes
Diagnostics indication LED	
• ERROR LED	Yes
• Channel status display	Yes
• for channel diagnostics	Yes
Integrated Functions	
Fast mode	Yes
Position detection	
• Absolute acquisition	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Dimensions	
Width	45 mm
Height	130 mm

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Technical specifications (continued)

Article number	6ES7147-4BB00-0AA0 ET 200pro EM 2 SSI
Depth	35 mm
Weights	
Weight, approx.	150 g

Article number	6ES7194-4CC00-0AA0 ET 200pro CM SSI 2 x M12
Dimensions	
Width	45 mm
Height	130 mm
Depth	39 mm
Weights	
Weight, approx.	340 g

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Overview



- 2-channel counter module for ET 200pro, incl. bus module
- For the connection of 24 V incremental encoders to ET 200pro
- For counting tasks with incremental encoders or incremental position encoder with 24 V signals
- 24 V encoder supply, short-circuit-proof
- Parameterizable input filters for suppressing interferences at encoder inputs
- 25-bit counting width
- Width 45 mm

Selection and ordering data

SIMATIC DP, electronic module For ET 200pro EM 2 Count 24V Counter module for 2 24 V incremental encoders, Incl. bus module; ET 200pro Count 2 x M12 CM connection module, 6ES7194-4CC10-0AA0, order separately	**6ES7147-4AB00-0AA0**
Accessories	
SIMATIC DP, COUNT 2 x M12 CM connection module For technology module ET 200pro EM 2 Count 24V	**6ES7194-4CC10-0AA0**
AS-Interface accessory M12 cover For IP67 modules, 15 mm outer diameter, with O-ring	**3RK1901-1KA00**
AS-Interface accessory M12 cover For IP67 modules, tamper-proof version, 15 mm outer diameter, with O-ring	**3RK1901-1KA01**
AS-Interface accessory M12 cover For IP67 modules, 12 mm outer diameter, without O-ring	**3RX9802-0AA00**
Device identification labels, for SIRIUS devices, 20x7 mm, titanium gray, package contents: 17 sheets with 20 labels each	**3RT2900-1SB20**
SIMATIC DP, module labels for ET 200 PRO For color-coding of the I/O connection modules; Pack of 100 20x7 labels in the colors red, green, blue, white, yellow	**6ES7194-4HA00-0AA0**
SIMATIC DP, slim module rack for ET 200 PRO I/O modules Length 500 mm	**6ES7194-4GA00-0AA0**
SIMATIC DP, slim module rack for ET 200 PRO I/O modules Sold by the meter for self-configuration, length 2000 mm	**6ES7194-4GA20-0AA0**
SIMATIC DP, slim module rack for ET 200 PRO I/O modules Length 1000 mm, new drilling pattern	**6ES7194-4GA60-0AA0**
SIMATIC DP, module rack, wide version for I/O modules and ET 200 PRO motor starter Length 500 mm	**6ES7194-4GB00-0AA0**
SIMATIC DP, module rack, wide version for I/O modules and ET 200 PRO motor starter Sold by the meter for self-configuration, length 2000 mm	**6ES7194-4GB20-0AA0**
SIMATIC DP, module rack, wide version for I/O modules and ET 200 PRO motor starter Length 1000 mm, new drilling pattern	**6ES7194-4GB60-0AA0**
SIMATIC DP, module rack, compact version for ET 200 PRO I/O modules Sold by the meter for self-configuration, length 2000 mm	**6ES7194-4GC20-0AA0**
SIMATIC DP, module rack, compact version for ET 200 PRO I/O modules Length 1000 mm, new drilling pattern	**6ES7194-4GC60-0AA0**
SIMATIC DP, module rack, compact version for ET 200 PRO I/O modules Length 500 mm, new drilling pattern	**6ES7194-4GC70-0AA0**
SIMATIC DP, compact module rack, wide version for I/O modules and motor starter ET 200 PRO Length 500 mm	**6ES7194-4GD00-0AA0**
SIMATIC DP, compact module rack, wide version for I/O modules and motor starter ET 200 PRO Length 1000 mm	**6ES7194-4GD10-0AA0**
SIMATIC DP, compact module rack, wide version for I/O modules and motor starter ET 200 PRO Sold by the meter for self-configuration, length 2000 mm	**6ES7194-4GD20-0AA0**

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Technical specifications

Article number	6ES7147-4AB00-0AA0 ET 200pro EM 2 Count 24V
General information	
Product function	
• I&M data	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 or higher
• PROFINET from GSD version/GSD revision	GSDML V2.35
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
from supply voltage 1L+, max.	30 mA; without output current for the 24 V Encoder supply
from backplane bus 3.3 V DC, max.	20 mA
Encoder supply	
Number of outputs	2
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	200 mA; Per channel
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz
• Cable length, shielded, max.	30 m
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Interface types	
• Sourcing/sinking input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Wire break	Yes
• short-circuit	Yes; Encoder supply to M, channel by channel
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• ERROR LED	Yes
• Channel status display	Yes
• for channel diagnostics	Yes
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	800 kHz; with quadruple evaluation

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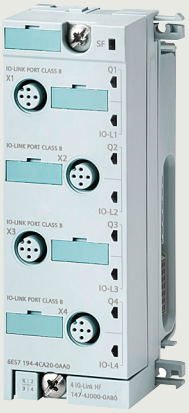
Technical specifications (continued)

Article number	6ES7147-4AB00-0AA0 ET 200pro EM 2 Count 24V
Fast mode	Yes
Position detection	
• Incremental acquisition	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Security	
signed firmware update	Yes
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

Article number	6ES7194-4CC10-0AA0 ET 200pro CM Count 2 x M12
Dimensions	
Width	45 mm
Height	130 mm
Depth	39 mm
Weights	
Weight, approx.	340 g

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Overview



- 45 mm wide 4 IO-Link HF electronic module
- 4 IO-Link ports according to IO-Link specification V1.1
- Port Class B
- The IO-Link parameters are configured using the Port Configuration Tool (S7-PCT), version V3.4 and higher

Selection and ordering data

4 IO-Link HF electronic module 4 IO-Link ports according to IO-Link specification V1.1, port Class B; High Feature, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7147-4JD00-0AB0**
Accessories	
CM IO-Link 4 x M12 P connection module 4 M12 sockets for connecting IO-Link devices to ET 200pro electronic module 4 IO-Link HF	**6ES7194-4CA20-0AA0**
Module identification labels For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	**6ES7194-4HA00-0AA0**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**

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Technical specifications

Article number	6ES7147-4JD00-0AB0 ET200pro, EM 4 IO-Link HF
General information	
Product function	
• Isochronous mode	No
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction; load increasing
Input current	
from supply voltage 1L+, max.	40 mA
from load voltage 2L+ (without load), max.	20 mA
from backplane bus 3.3 V DC, max.	20 mA
Encoder supply	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
Output current	
• up to 55 °C, max.	2 A
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Size of process data, input per port	32 byte
Size of process data, input per module	32 byte
Size of process data, output per port	32 byte
Size of process data, output per module	32 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	possible with LIOLink_Master function block
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: for X1 and X2 max. 2 A in total, for X3 and X4 max. 2 A in total
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Wire break	Yes; channel by channel
• short-circuit	Yes; channel by channel
Diagnostics indication LED	
• Channel status display	Yes; One green LED for channel status Qn (SIO mode) and port status IO-Ln (IO-Link mode)

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Technical specifications (continued)

Article number	6ES7147-4JD00-0AB0 ET200pro, EM 4 IO-Link HF
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes; combined with the IO-Link port status
Potential separation	
between the load voltages	Yes
between backplane bus and all other circuit components	Yes
Potential separation channels	
• between the channels	No
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	No
Security	
signed firmware update	Yes
safely removing data	Yes
data integrity	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

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Overview



Fail-safe digital inputs/outputs with degree of protection IP65/66/67 for cabinet-free application on the machine level.

Fail-safe digital inputs

- For fail-safe reading of sensor information (1 or 2 channels)
- Provide integral discrepancy evaluation for 2-out-of-2 signals
- Internal sensor supplies (incl. test function) available

Fail-safe digital outputs

- Fail-safe 2-channel activation (sinking/sourcing output) by actuators
- Actuators can be controlled up to 2 A

All modules are certified up to SIL 3 (IEC 61508) and feature detailed diagnostics.

The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with IM151-7 F-CPU, CPU31xF-2 DP, CPU31xF-2 PN/DP and CPU416F-2.

Selection and ordering data

8/16 F-DI PROFIsafe fail-safe digital input module 24 V DC, including bus module. Terminal module must be ordered separately	**6ES7148-4FA00-0AB0**
Fail-safe digital input/output module 4/8 F-DI, 4 F-DO 2 A 24 V DC, including bus module. Terminal module must be ordered separately	**6ES7148-4FC00-0AB0**
Fail-safe electronic module F-Switch PROFIsafe Three fail-safe outputs switching to PP potential for safe switching of the rear panel busbar (2L+, F0, F1); two fail-safe digital inputs, 45 mm; usable up to SIL3 (IEC 61508)	**6ES7148-4FS00-0AB0**
Accessories	
Terminal module For the fail-safe electronic module F-Switch PROFIsafe	**6ES7194-4DA00-0AA0**
Terminal module For the fail-safe electronic module 4/8 F-DI/4 F-DO, 24 V DC/2 A	**6ES7194-4DC00-0AA0**
Terminal module For the fail-safe electronic module 8/16 F-DI, 24 V DC	**6ES7194-4DD00-0AA0**
PROFIBUS DP IM154-2 interface module Including termination module	**6ES7154-2AA01-0AB0**
PROFINET IM154-4 PN interface module Including termination module	**6ES7154-4AB10-0AB0**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**

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Technical specifications

Article number	6ES7148-4FA00-0AB0 ET200PRO, EI-Mod., 8/16 F-DI 24V DC
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
from supply voltage 1L+, max.	120 mA; Typical
from backplane bus 3.3 V DC, max.	20 mA
Digital inputs	
Number of digital inputs	16
Input current	
• for signal "1", typ.	3.7 mA
Dimensions	
Width	90 mm
Height	130 mm
Depth	65 mm

Article number	6ES7148-4FC00-0AB0 ET200PRO,EI-Mod,4/8 F-DI/4 F-DO 24VDC/2A	6ES7148-4FS00-0AB0 ET200PRO,EI-Mod, F-Switch PROFIsafe
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
from supply voltage 1L+, max.	100 mA; Typical	50 mA
from load voltage 2L+ (without load), max.	50 mA; Typical	25 mA; Typical
from backplane bus 3.3 V DC, max.	20 mA	40 mA
Digital inputs		
Number of digital inputs	8	2
Input current		
• for signal "1", typ.	3.7 mA	3.5 mA
Digital outputs		
Number of digital outputs	4	3
Short-circuit protection	Yes	Yes
Controlling a digital input	Yes; digital output, according to IEC 61131-2, type 2	
Output current		
• for signal "1" rated value	2 A	
Total current of the outputs (per group)		
- all mounting positions		
- up to 55 °C, max.		6 A
Dimensions		
Width	90 mm	45 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm

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Overview



• PM-E DC 24 V power module

Selection and ordering data

PM-E DC 24 V power module For backfeed and group formation of the 24 V DC load voltage for electronic modules within an ET 200pro station.	**6ES7148-4CA00-0AA0**
Accessories	
CM PM-E ECOFAST connection module For backfeed of 24 V load voltage, 1 ECOFAST Cu connection	**6ES7194-4BA00-0AA0**
CM PM-E direct connection module For backfeed of 24 V load voltage, up to 2 M20 screwed cable glands	**6ES7194-4BC00-0AA0**
CM PM-E 7/8" connection module For backfeed of 24 V load voltage, 1 x 7/8"	**6ES7194-4BD00-0AA0**
CM PM-E PP connection module For supplying 24 V load voltage, 2 x push-pull, with spare fuse	**6ES7194-4BE00-0AA0**
PM-E M12-L connection module For backfeed of 24 V load voltage, 1x M12-L	**6ES7194-4BL00-0AA0**
Spare fuse 12.5 A quick-response, for interface and power modules, 10 items per package unit	**6ES7194-4HB00-0AA0**
PROFIBUS ECOFAST hybrid cable, copper Trailable cable (PUR sheath), with two shielded Cu wires for PROFIBUS DP plus four Cu wires of 1.5 mm^2, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m Preassembled with ECOFAST plug and socket, fixed length	**6XV1830-7AH10**
• 1.5 m	**6XV1830-7BH15**
• 3 m	**6XV1830-7BH30**
• 5 m	**6XV1830-7BH50**
• 10 m	**6XV1830-7BN10**
• 15 m	**6XV1830-7BN15**
• 20 m	**6XV1830-7BN20**
PROFIBUS ECOFAST hybrid cable GP Trailable cable with 4 x copper cores and 2 x copper cores, shielded, with UL approval Preassembled with ECOFAST plug and socket	
• 1.5 m	**6XV1860-3PH15**
• 3 m	**6XV1860-3PH30**
• 5 m	**6XV1860-3PH50**
• 10 m	**6XV1860-3PN10**
• 15 m	**6XV1860-3PN15**
• 20 m	**6XV1860-3PN20**
ECOFAST connection plug, for user assembly Socket; ordering unit 5 items	**6GK1905-0CB00**
PROFIBUS ECOFAST hybrid plug, angled With 2 x shielded copper cores and 4 x 1.5 mm2 copper cores; 5 items; with assembly instructions; socket insert	**6GK1905-0CD00**
Push-pull connection plug For 1L+/ 2L+, unassembled	**6GK1907-0AB11-6AA0**
Cover caps for push-pull sockets 5 units	**6ES7194-4JA50-0AA0**
Accessories for CM PM-E direct	

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Selection and ordering data (continued)

Power cable 5-wire, 5 x 1.5 mm², trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m. Accessories for CM PM-E 7/8"	**6XV1830-8AH10**
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors, 5-pin	
• 1.5 m long	**6XV1822-5BH15**
• 2.0 m long	**6XV1822-5BH20**
• 3.0 m long	**6XV1822-5BH30**
• 5.0 m long	**6XV1822-5BH50**
• 10 m long	**6XV1822-5BN10**
• 15 m long	**6XV1822-5BN15**
7/8" connection plug With axial cable outlet	
• With socket insert, 5-pack	**6GK1905-0FB00**

Technical specifications

Article number	6ES7148-4CA00-0AA0 ET 200pro, PM-E 24V DC
Supply voltage	
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes; via an exchangeable fuse in the power module
• Reverse polarity protection	Yes; against destruction
Input current	
from load voltage 2L+, max.	3 mA
Current carrying capacity	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Missing load voltage	Yes
Diagnostics indication LED	
• For load voltage monitoring	Yes
• Group error SF (red)	Yes
Potential separation	
between load voltage and backplane bus	Yes
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	140 g

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Overview



PM-O 2 x 24 V DC power module with CM PM-O PP

- PM-O 2x 24 V DC power module

Selection and ordering data

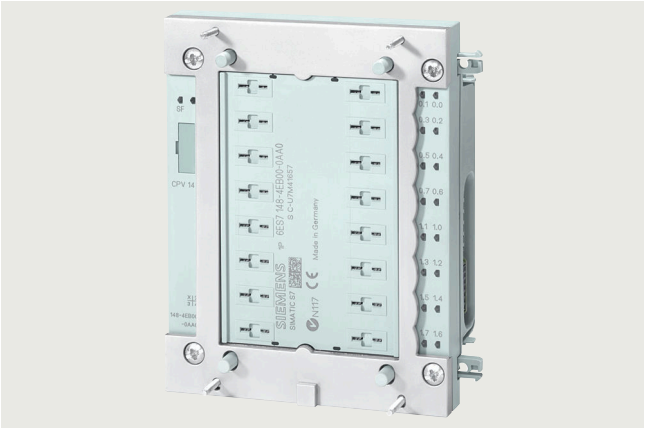
PM-O 2 x 24 V DC power module For drawing the 24 V load voltage 2L+ and electronic/encoder supply voltage 1L+ within an ET 200pro station.	**6ES7148-4CA60-0AA0**
Accessories	
CM PM-O PP connection module For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector	**6ES7194-4BH00-0AA0**
Push-pull connection plug For 1L+/ 2L+, unassembled	**6GK1907-0AB11-6AA0**
Cover caps for push-pull sockets 5 units	**6ES7194-4JA50-0AA0**

Technical specifications

Article number	6ES7148-4CA60-0AA0 ET200PRO, PM-O DC 2x24V
Supply voltage	
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Input current	
from load voltage 2L+, max.	3 mA
Current carrying capacity	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Missing load voltage	No
Diagnostics indication LED	
• For load voltage monitoring	No; Signalled in IM or in PM
• Group error SF (red)	Yes
Potential separation	
between load voltage and backplane bus	Yes
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

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Overview



- Interface for holding an original FESTO CPV 10 or CPV 14 compact performance valve terminal
- For using ET 200pro in applications with flexible pneumatics
- Highly flexible pneumatics due to a variety of valve functions and choice of flow rates

Selection and ordering data

EM 148-P pneumatic interface	
DO 16 x P/CPV 10 for direct accommodation of FESTO valve terminal CPV 10 16 DO x P	**6ES7148-4EA00-0AA0**
DO 16 x P/CPV 14 for direct accommodation of FESTO valve terminal CPV 14 16 DO x P	**6ES7148-4EB00-0AA0**
FESTO CPV 10 valve terminal	available from FESTO
FESTO CPV 14 valve terminal	available from FESTO
	FESTO AG & Co Ruiterstr. 82 D-73732 Esslingen More addresses on the Internet at: http://www.festo.com

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Technical specifications

Article number	6ES7148-4EA00-0AA0 ET200PRO, 16DO,Pneumatic Interface CPV10	6ES7148-4EB00-0AA0 ET200PRO, 16DO,Pneumatic Interface CPV14
Supply voltage		
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes
Input current		
from load voltage 2L+, max.	300 mA; Including valves	370 mA; Including valves
from backplane bus 3.3 V DC, max.	25 mA	25 mA
Power loss		
Power loss, typ.	2.6 W	3.7 W
Address area		
Address space per module		
• Address space per module, max.	2 byte	2 byte
Digital outputs		
Number of digital outputs	16	16
Load resistance range		
• lower limit	500 Ω	500 Ω
• upper limit	2 500 Ω	2 500 Ω
Output current		
• for signal "1" rated value	12 mA	16 mA
Switching frequency		
• with inductive load, max.	25 Hz	20 Hz
Total current of the outputs (per group)		
- all mounting positions		
- up to 55 °C, max.	250 mA; only up to 50 °C, limited by valves	330 mA; only up to 50 °C, limited by valves
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Diagnostic information readable	Yes	Yes
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
Pneumatics		
Number of connectable valves, max.	16	16
permissible working pressure, min.	3 bar	3 bar
permissible working pressure, max.	8 bar	8 bar
Rated flow rate	400 l/min	800 l/min
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Dimensions		
Width	90 mm	120 mm
Height	130 mm	152 mm
Depth	47 mm	47 mm

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Overview



The SIMATIC RF170C is a communications module for connecting the SIMATIC identification systems to the ET 200pro distributed I/O system. The readers of all RFID systems as well as the MV400 optical readers and MV300 optical handheld readers can be operated on the RF170C. In addition, the RF170C provides a universal RS232/ RS422 interface for connecting devices using the Freeport protocol.

Thanks to the high degree of protection and ruggedness, ET 200pro is particularly suitable for machine-level use. The modular structure with PROFIBUS and PROFINET connection systems allows it to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

Selection and ordering data

	Article No.
SIMATIC RF170C communications module For connecting to the ET 200pro distributed I/O system	**6GT2002-0HD01**
Accessories	
Connection block for SIMATIC RF170C For connecting 2 readers or other RS422/RS232 devices via an M12 connector	**6GT2002-1HD01**
	
Reader cable for SIMATIC RF200 / RF300 / RF600 / MV440 Or MOBY D extension cable and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, trailable	
	
	
2 m, straight plug	**6GT2891-4FH20**
5 m, straight plug	**6GT2891-4FH50**
10 m, straight plug	**6GT2891-4FN10**
20 m, straight plug	**6GT2891-4FN20**
50 m, straight plug	**6GT2891-4FN50**
2 m, plug angled at reader	**6GT2891-4JH20**
5 m, plug angled at reader	**6GT2891-4JH50**
10 m, plug angled at reader	**6GT2891-4JN10**
Connecting cable for SIMATIC RF1000 Prefabricated RS232, between RF1040R or RF1070R and a communications module; black, length 2 m	**6GT2891-4UH20**
	
Reader cable for MV300 handheld readers Coiled cable with usable length of 1.6 m to 4 m for MV320, PUR material	**6GT2191-0BH50**

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Selection and ordering data (continued)

	Article No.
	
Plug for connection of other RS422/RS232 devices 8-pole M12 plug, male, screw connections for wires up to 0.5 mm². Order quantity 1 pack with 5 units	**6GT2090-0BE00**
	
M12 sealing caps for unused reader connections Minimum order quantity 10 units, price per 100 units	**3RX9802-0AA00**

Technical specifications

Article number	6GT2002-0HD01
product type designation	RF170C communication module
product brand name	SIMATIC RF
Technical Product Detail Page	https://i.siemens.com/1P6GT2002-0HD01
suitability for operation	ET 200pro distributed I/O together with RF200/300/1000, MV300/400/500, MOBY D/E/I/U and RS-232 devices
transfer rate	
transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
interfaces	
design of the interface for point-to-point connection	RS422/RS232 via connection block
number of readers connectable	2
type of electrical connection	
• of the backplane bus	ET 200pro backplane bus
• of the PROFIBUS interface	(according to the head module)
• of Industrial Ethernet interface	(according to the head module)
• for supply voltage	ET 200pro backplane bus
design of the interface to the reader for communication	Internal plug to the connection block
mechanical data	
material	Thermoplastic (Valox 467, fiberglass reinforced)
color	IP Basic 714
tightening torque of the screw for securing the equipment maximum	1.5 N·m
supply voltage, current consumption, power loss	
supply voltage at DC	
• rated value	24 V
•	20 ... 30 V
consumed current	
• at DC at 24 V without connected devices typical	0.13 A
• from supply voltage 1L+ maximum	1 A
ambient conditions	
ambient temperature	
• during operation	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
protection class IP	IP67
shock resistance	According to IEC 61131-2
shock acceleration	300 m/s²
vibrational acceleration	100 m/s²
design, dimensions and weights	
width	90 mm
height	130 mm
depth	35 mm
net weight	0.27 kg
fastening method	ET 200pro rack
wire length for RS 422 interface maximum	1 000 m
product features, product functions, product components general	
display version	(see connection block)
product function addressable transponder file handler	No
protocol is supported	

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Technical specifications (continued)

Article number	6GT2002-0HD01
product type designation	RF170C communication module
• S7 communication	Yes
product functions management, configuration, engineering	
type of parameterization	HSP
type of programming	FB 45, FB 55, ID profile, library with functions, (FC 45/55 with restricted functionality)
type of computer-switched communication	acyclic communication
standards, specifications, approvals	
certificate of suitability	CE, FCC, cULus
MTBF	77 a
product function is supported identification link	No
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	101.43 kg
• during manufacturing	16 kg
• during operation	85.3 kg
• after end of life	0.13 kg
accessories	
accessories	Connection block for RF170C
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to web page: identification and localization systems	https://www.siemens.com/ident
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



Power supply for ET200pro:

• 3-phase, 24 V DC/8 A

The SIMATIC ET200pro PS power supply unit with IP67 degree of protection is used as the electronics/encoder supply and load voltage supply of the new SIMATIC ET 200pro distributed I/O system for use close to the machine without a cabinet. With a second connector for looping the input voltage.

Product highlights

• 3-phase, 24 V DC/8 A

• Wide-range input, input voltage 340 ... 550 V

• Up to 88% efficiency

• With signaling contact for "24 V OK" and "Overtemperature"

• Status indicator on the device by means of LED (green = "24 V OK")

• Temperature range from -25 °C to +55 °C

Selection and ordering data

SIMATIC ET 200pro PS Stabilized power supply in distributed I/O system design, permitting the loop-through of energy to further modules; with degree of protection IP67; Input: 400-480 V 3 AC Output: 24 V DC/8 A	**6ES7148-4PC00-0HA0**
Accessories	
Power connector For connecting to the distributed I/O system	
• For X1 (6 mm^2)	**3RK1911-2BE30**
• For X2 (4 mm^2)	**3RK1911-2BF10**
National Fire Protection Association (NFPA) compatibility These devices are only approved for installation in industrial machinery according to the NFPA79 Electrical Standard for Industrial Machinery.	
• For X1 SIMATIC ET 200pro PS 61 88 201 1003.xx (AWG10)*	* http://www.harting.com
• For X1 SITOP PSU300P 61 88 201 1000.xx / 61 88 201 1002.xx (AWG14)*	
• For X2 SIMATIC ET 200pro PS 61 88 202 1010.xx (AWG10)*	
blanking cap for X2 included	**3RK1902-0CK00**
• For X3 Phoenix-Contact SAC-5P-M12-M12FS	
blanking cap for X3 included	
Sealing cap For 9-pin power sockets	
• X2 (1 unit)	**3RK1902-0CK00**
• X2 (10 units)	**3RK1902-0CJ00**

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Technical specifications

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC
type of current supply	24 V/8 A
General information	
Technical Product Detail Page	https://i.siemens.com/1P6ES7148-4PC00-0HA0
input	
type of the power supply network	3-phase AC
supply voltage at AC	
• minimum rated value	400 V
• maximum rated value	480 V
• initial value	340 V
• full-scale value	550 V
supply voltage at AC	320 ... 340 V for max. 1 min
wide range input	Yes
overvoltage overload capability	Implemented internally with varistors
buffering time for rated value of the output current in the event of power failure minimum	15 ms
operating condition of the mains buffering	at Vin = 400 V
line frequency	50 Hz/60 Hz
line frequency	45 ... 66 Hz
input current	
• at rated input voltage 400 V	0.5 A
current limitation of inrush current at 25 °C maximum	40 A
I2t value maximum	3.5 A^2·s
fuse protection type	T 4 A
fuse protection type in the feeder	Required: Circuit breaker 3RV2011-1DA10 or 3RV2711-1DD10 (UL 489)
output	
voltage curve at output	Controlled, isolated DC voltage
output voltage at DC rated value	24 V
output voltage	
• at output 1 at DC rated value	24 V
	24 V
output voltage adjustable	No; -
relative overall tolerance of the voltage	3 %
relative control precision of the output voltage	
• on slow fluctuation of input voltage	0.5 %
• on slow fluctuation of ohm loading	0.5 %
residual ripple	
• maximum	200 mV
voltage peak	
• maximum	250 mV
display version for normal operation	Green LED for 24 V OK
type of signal at output	max. 30 V, 10 mA; Power-Good (High-Pegel 1L+ for Vout in range 21.3 ... 29 V); Overtemperature warning at least 30 s before switch-off (high level 1L+ when the max. internal temperature is exceeded)
behavior of the output voltage when switching on	Overshoot of Vout < 2 %
response delay maximum	1.5 s
voltage increase time of the output voltage	
• typical	40 ms

Technical specifications (continued)

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC
type of current supply	24 V/8 A
output current	
• rated value	8 A
• rated range	0 ... 8 A
	5.1 ... 9.9 A
supplied active power typical	192 W
short-term overload current	
• on short-circuiting during the start-up typical	50 A
• at short-circuit during operation typical	50 A
duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
bridging of equipment	No
efficiency	
efficiency in percent	88 %
power loss [W]	
• at rated output voltage for rated value of the output current typical	25 W
closed-loop control	
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.5 %
relative control precision of the output voltage load step of resistive load 50/100/50 % typical	1 %
setting time	
• maximum	2 ms
protection and monitoring	
design of the overvoltage protection	< 33 V
property of the output short-circuit proof	Yes
design of short-circuit protection	Electronic shutdown, automatic restart
• typical	9.4 A
enduring short circuit current RMS value	
• maximum	10 A
safety	
galvanic isolation between input and output	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class I
leakage current	
• maximum	3.5 mA
• typical	0.4 mA
protection class IP	IP67
EMC	
standard	
• for emitted interference	EN 55022 Class A
• for mains harmonics limitation	-
• for interference immunity	EN 61000-6-2
standards, specifications, approvals	
certificate of suitability	
• CE marking	Yes

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Technical specifications (continued)

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC
type of current supply	24 V/8 A
• UL approval	Yes; UL-Listed (UL 508) according to NFPA compatibility (National Fire Protection Association), see operating instructions
• EAC approval	Yes
• NEC Class 2	No
type of certification	
• CB-certificate	Yes
MTBF at 40 °C	196 354 h
standards, specifications, approvals hazardous environments	
certificate of suitability	
• IECEx	No
• ATEX	No
• ULhazloc approval	No
• FM registration	No
standards, specifications, approvals marine classification	
shipbuilding approval	No
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• French marine classification society (BV)	No
• Det Norske Veritas (DNV)	No
• Lloyds Register of Shipping (LRS)	No
ambient conditions	
ambient temperature	
• during operation	-25 ... +55 °C; with natural convection
• during transport	-40 ... +70 °C
• during storage	-40 ... +70 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation
connection method	
type of electrical connection	screw terminal
• at input	L1, L2, L3, PE: Plug connector HAN Q4/2 (counterpart see "Electrical accessories")
• at output	L+, M: 2 x 1.5 mm² each (4-pole cable for +/- with open, labeled ends, 4 x 1.5 mm²)
• for auxiliary contacts	Alarm signals: M12 plug-in connector 5-pin
mechanical data	
width × height × depth of the enclosure	310 mm × 135 mm × 90 mm
fastening method	Can be mounted onto ET200pro mounting rail
• DIN-rail mounting	No
• S7 rail mounting	No
• wall mounting	Yes
housing can be lined up	No
net weight	2.8 kg
accessories	
electrical accessories	Power connector (Input: 3RK1911-2BE30 (6 mm²)) (Output: 3RK1911-2BF10 (4 mm²))
further information internet links	
internet link	

Technical specifications (continued)

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC
type of current supply	24 V/8 A
• to website: Industry Mall	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com
additional information	
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview

ET 200pro motor starters in I/O system ET 200pro

SIMATIC ET 200pro is the modular I/O system with high degree of protection IP65/IP66/IP67 for local, cabinet-free use. The ET 200pro motor starters with the high degree of protection IP65 are an integral part of ET 200pro.



ET 200pro motor starter: Isolator module, Standard starter and High Feature starter mounted on a wide module rack

More information

Homepage, **see** www.siemens.com/sirius-motor-starter-et200pro

SiePortal, **see** www.siemens.com/product_catalog_siep?ET200pro

Decision support for motor start - Starting and operating three-phase asynchronous motors efficiently, **see** www.siemens.com/motorstart-guide

Catalog IC 10, **see** www.siemens.com/ic10

Further components in the ET 200pro distributed I/O system:
- Interface modules, central processing units, I/O modules, ET 200pro PS, see Catalog ST 70
- ET 200pro FC-2 frequency converters, see Catalog D 31.2

ET 200pro motor starters

- Only two versions up to 5.5 kW
- All settings can be configured via bus
- Comprehensive diagnostic messages
- Support for PROFIenergy
- Overload can be acknowledged by remote RESET
- Current asymmetry monitoring
- Stall protection
- EMERGENCY-START function on overload
- Current value transmission by bus
- Current limit monitoring
- Full support of acyclic services
- Direct-on-line or reversing starters
- Power bus connection can be plugged in using the new Han Q4/2 plug-in connectors
- Motor feeder with Han Q8/0 connector
- Conductor cross-sections up to 6 x 4 mm²
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High Feature versions (with 4 DI on-board)
- Electromechanical switching and electronic switching
- Electronic direct-on-line starter or with integrated soft starter function
- Optionally available with 400 V AC brake contact
- Temperature sensor can be connected (Thermoclick or PTC type A)
- Provision of the motor current in PROFIenergy format to higher-level systems, motor current shutdown in dead times using PROFIenergy

ET 200pro isolator modules

The isolator module with switch disconnector function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

Safety applications

PROFIsafe Safety Solution

With the PROFIsafe Safety modules

- F-Switch and
- 400 V disconnecting module

with an appropriate connection, safety levels SIL 3 (according to IEC 62061) or PL e (according to ISO 13849-1) can also be reached.

Functionality

With the ET 200pro motor starters, any three-phase loads can be protected and switched.

The ET 200pro motor starters are available with mechanical as well as electronic contacts.

The ET 200pro electromechanical starters are offered as direct-on-line starters (DSe) and reversing starters (RSe) in **Standard** and **High Feature** versions. There are device versions with or without control for externally supplied brakes with 400 V AC.

Compared with the Standard motor starters, the **High Feature, mechanical** motor starter also has:

- Four digital inputs
- Advanced parameterization options

The ET 200pro electronic starters are offered as direct-on-line starters (sDSSte/sDSte) and reversing starters (sRSSte/sRSte) in the High Feature version.

Compared with the High Feature mechanical motor starters, the **High Feature electronic** motor starter also has:

- Soft starting and smooth ramp-down function
- Deactivated soft start function as an electronic starter for applications with a high switching frequency
- Advanced parameterization options

As a result of the protection concept with solid-state overload evaluation and the use of SIRIUS switching devices, size S00, additional advantages are realized on the Standard and High Feature motor starters – advantages that soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

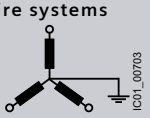
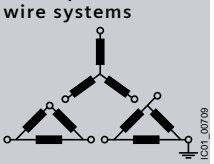
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Overview (continued)

- Plant configuration is made easier and flexibility is increased by the fine modular structure with ET 200pro. When using the ET 200pro motor starters, the bill of materials per load feeder is reduced to two main items: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveyor systems and in machine-tool construction.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation), a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are also optimized by the low level of variance (two units up to 5.5 kW).
- With four locally acting inputs available on the High Feature motor starter, autonomous special functions can be implemented that operate independently of the bus and the higher-level control system, e.g. as a quick stop on slide valve controls or end position disconnections. In parallel with this, the states of these inputs are signaled to the control system.

Voltage data

The data for 3-phase systems according to IEC 60947-4-1 are valid for the following line system configurations:

Voltage U_e	Line system configurations	
	Three-phase four-wire systems 	Three-phase three-wire systems 
V	V	V
230	--	230
400	230/400	400
440	260/440	440
500	--	500

-- Not specified

Article number schemes

Product versions		Article number												
Motor starters		**3RK1304**	**–**	**5**	❑	**S**	❑	**0**	**–**	❑	**A**	**A**	❑	
Setting range	0.15 ... 2.0 A				**K**									
	1.5 ... 12 A				**L**									
Product function	Direct-on-line starters DSe						**4**			**4**				Standard
	Reversing starters RSe						**4**			**5**				Standard
	Direct-on-line starters DSe						**4**			**2**				High Feature
	Reversing starters RSe						**4**			**3**				High Feature
	Direct-on-line starters sDSSte/sDSte						**7**			**2**				High Feature
	Reversing starters sDSSte/sDSte						**7**			**3**				High Feature
Inputs/outputs	Without brake output												0	
	With brake output												3	400 V AC, with High Feature + 4 inputs
Example		**3RK1304**	**–**	**5**	**K**	**S**	**4**	**0**	**–**	**4**	**A**	**A**	**0**	

Product versions		Article number											
Modules		**3RK1304**	**–**	**0**	**H**	**S**	**0**	**0**	**–**	❑	**A**	**A**	**0**	
Product function	Isolator modules									**6**				
	400 V disconnecting modules									**8**				PROFIsafe Safety modules
Example		**3RK1304**	**–**	**0**	**H**	**S**	**0**	**0**	**–**	**6**	**A**	**A**	**0**	

Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

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Overview (continued)

Type Technology designation[1)]		Standard motor starters DSe, RSe	High Feature motor starters DSe, RSe	sDSSte, sDSte, sRSSte, sRSte
Device functions (firmware features)				
Configurable rated operational current		✓		
Integrated short-circuit protection		✓		
Configurable current limit values		--	✓ 2 limit values	
Configurable response in case of current limit violation		--	✓	
Zero current monitoring		✓		
Configurable response in case of zero current violation		✓		
Configurable current asymmetry limit	%	-- Fixed limit value (30 x I_e)	✓ 30 ... 60 x I_e	
Configurable response in case of asymmetry limit violation		✓		
Motor blocking monitoring		--	✓	
Configurable blocking current limit	%	--	✓ 150 ... 1 000 x I_e	
Configurable blocking time limit	s	--	✓ 1 ... 5	
Current value transmission		✓		
Group warning diagnostics		--	✓ Configurable	
Group diagnostics		✓ Configurable		
EMERGENCY START		✓		
Digital inputs		--	✓ 4 inputs	
• Configurable input signal		--	✓ Latching/non-latching	
• Configurable input level		--	✓ NC/NO contacts	
• Configurable input signal delay	ms	--	✓ 10 ... 80	
• Configurable input signal extension	ms	--	✓ 0 ... 200	
• Configurable input control actions		--	✓ 12 different actions	
Brake output (400 V AC)		✓ Order option		
Configurable brake enabling delay	s	✓ -2.5 ... +2.5		
Configurable holding time of the brake during stopping	s	✓ 0 ... 25		
Configurable startup type		--		✓
Configurable ramp-down time		--		✓
Configurable starting voltage		--		✓
Configurable stopping voltage		--		✓
Local device interface		✓		
Firmware update		✓ By specialists		
Thermal motor model		✓		
Configurable trip class		-- Class 10 fixed	✓ CLASS 5, 10, 15, 20	
Configurable response in case of overload of thermal motor model		--	✓ 3 possible states	
Advance warning limit for motor heating	%	--	✓ Configurable 0 ... 95	
Advance warning limit time-related trip reserve	s	--	✓ Configurable 0 ... 500	
Configurable recovery time	min	--	✓ 1 ... 30	
Configurable protection against voltage failure		-- Permanently integrated	✓	
Reversing start function		✓ Order option		
Configurable interlock time for reversing starters		-- 150 ms fixed	✓ 0 ... 60 s	
Integrated logbook functions		✓ 3 device logbooks		
Integrated statistics data memory		✓		
Configurable response in case of CPU/master STOP		✓		
PROFIenergy profile support				
• Disconnection of the motor current during dead times		✓		

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Overview (continued)

Type Technology designation[1)]	Standard motor starters DSe, RSe	High Feature motor starters DSe, RSe	sDSSte, sDSte, sRSSte, sRSte
• Measured motor current values	✓		
Device indications			
• Group fault	SF LED (red)		
• Switching state	STATE LED (red, yellow, green)		
• Device status	DEVICE LED (red, yellow, green)		
• Digital inputs	--	IN 1 ... IN 4, LED	

✓ Function available
-- Function not available
1) DS .... Direct-on-line starters
RS .... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
e ..... Electronic motor protection
te ..... Full motor protection (thermal + electronic)
s ..... Electronic switching with semiconductor.

Benefits

ET 200pro motor starters provide the following advantages:

- High flexibility thanks to a modular and compact design
- Little variance among all motor starter versions (two units up to 5.5 kW)
- Extensive parameterization using STEP 7 HW-Config
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs for on-site control functions (High Feature)
- Cabinet-free construction thanks to high degree of protection IP65

Application

The SIMATIC ET 200pro motor starters are ideal for the use of several spatially concentrated distributed drive solutions in which several motors, or digital or analog sensors and actuators are addressed from a distributed station. They are perfectly suited for protecting and switching any AC loads.

Application areas

The SIMATIC ET 200pro motor starters are suitable for numerous sectors of industry, e.g. machinery and plant engineering or conveying applications.

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Technical specifications

More information

Equipment Manual, **see** https://support.industry.siemens.com/cs/ww/en/view/22332388

Notes on security:
System networking requires suitable protective measures (e.g. network segmentation for IT security) to ensure safe system operation. For more information on industrial cybersecurity, **see** www.siemens.com/cybersecurity-industry.

Type		Standard motor starters	High Feature motor starters	
		Mechanical switching without inputs	Mechanical switching with inputs	Electronic switching with inputs and soft starter function
Technology designation[1]		DSe, RSe	DSe, RSe	sDSSte, sDSte, sRSSte, sRSte
Mechanics and environment				
Motor starters or modules that can be connected to ET 200pro With width of 110 mm		max. 8		
Mounting dimensions (W x H x D)				
• Direct-on-line starters and reversing starters	mm	110 x 230 x 150		110 x 230 x 160
Permissible ambient temperature				
• During operation	°C	-25 ... +55, from +40 with derating		
• During storage	°C	-40 ... +70		
Permissible mounting position		Vertical, horizontal		
Vibration resistance acc. to IEC 60068-2-6	*g*	2		
Shock resistance according to IEC 60068-2-27	*g*/ms	Half-sine 15/11		
Degree of protection		IP65		
Pollution degree		3, IEC 60664 (IEC 61131)		
Electrical specifications				
Power consumption at 24 V DC				
• From auxiliary circuit L+/M (U1)	mA	Approx. 40		
• From auxiliary circuit A1/A2 (U2)	mA	Approx. 200		
Rated operational current I_e for power bus	A	25		
Rated operational voltage U_e	V AC	400 (50/60 Hz)		
• Approval according to EN 60947-1, Annex N	V AC	Up to 400 (50/60 Hz)		Up to 400 (50/60 Hz)
• Approval according to CSA and UL	V AC	Up to 600 (50/60 Hz)		Up to 480 (50/60 Hz)
Approval				
• DIN VDE 0106, Part 101	V	Up to 400		Up to 480
• CSA and UL approval	V	Up to 600		Up to 480
Conductor cross-sections				
• Incoming power supply	mm^2	Max. 6 x 4		
Touch protection		Finger-safe		
Rated impulse withstand voltage U_{imp}	kV	6		
Rated insulation voltage U_i	V	400		
Rated operational current I_e for starters				
• AC-1, AC-2, AC-3, AC-3e at 40 °C				
- At 400 V	A	0.15 ... 2/1.5 ... 12		0.15 ... 2/1.5 ... 12[2]
- At 500 V	A	0.15 ... 2/1.5 ... 9		
• AC-4 at 40 °C				
- At 400 V	A	0.15 ... 2/1.5 ... 4		
Rated short-circuit breaking capacity	kA	100 at 400 V		
Type of coordination according to IEC 60947-4-1		1		
Power of three-phase motors at 400 V	kW	Max. 5.5		Max. 5.5/4[3]
Utilization categories		AC-1, AC-3, AC-3e, AC-4		AC-53a[4] (max. 9 A with deactivated soft start function up to Class 10)
Protective separation between main and auxiliary circuits	V	400, according to EN 60947-1, Annex N		
Endurance of contactor				

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Technical specifications (continued)

Type		Standard motor starters	High Feature motor starters	
		Mechanical switching without inputs	Mechanical switching with inputs	Electronic switching with inputs and soft starter function
Technology designation[1]		DSe, RSe	DSe, RSe	sDSSte, sDSte, sRSSte, sRSte
• Mechanical	Operating cycles	30 million		--
• Electrical	Operating cycles	Up to 10 million; depending on the current loading (see Equipment Manual)		--
Permissible switching frequency		Depending on the current loading, motor starting time, and relative ON period (see Equipment Manual)		
Operating times for 0.85 ... 1.1 x U_e				
• Closing delay	ms	11 ... 50		--
• Opening delay	ms	5 ... 45		--

1) DS .... Direct-on-line starters
RS .... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
e ..... Electronic motor protection
te ..... Full motor protection (thermal + electronic)
s ..... Electronic switching with semiconductor.
2) If the soft starter control function is deactivated, the permissible rated operational current is reduced to 9 A up to Class 10.
3) With parameterization as electronic starter max. 4 kW.
4) 8-hour operation.

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Overview

For the functionality, device functions and technical specifications of the Standard motor starter, see ET 200pro motor starters.



Standard motor starters, mechanical: Direct-on-line starters DSe

Selection and ordering data

	Version	Setting range Rated operational current	Article No.
Standard motor starters, mechanical Motor protection: thermal model			
 DSe Standard	**Direct-on-line starters DSe** [1]		
	• Without brake output	0.15 ... 2 A	**3RK1304-5KS40-4AA0**
	• With brake output 400 V AC		**3RK1304-5KS40-4AA3**
	• Without brake output	1.5 ... 12 A	**3RK1304-5LS40-4AA0**
	• With brake output 400 V AC		**3RK1304-5LS40-4AA3**
	Reversing starters RSe [1]		
	• Without brake output	0.15 ... 2 A	**3RK1304-5KS40-5AA0**
	• With brake output 400 V AC		**3RK1304-5KS40-5AA3**
	• Without brake output	1.5 ... 12 A	**3RK1304-5LS40-5AA0**
	• With brake output 400 V AC		**3RK1304-5LS40-5AA3**

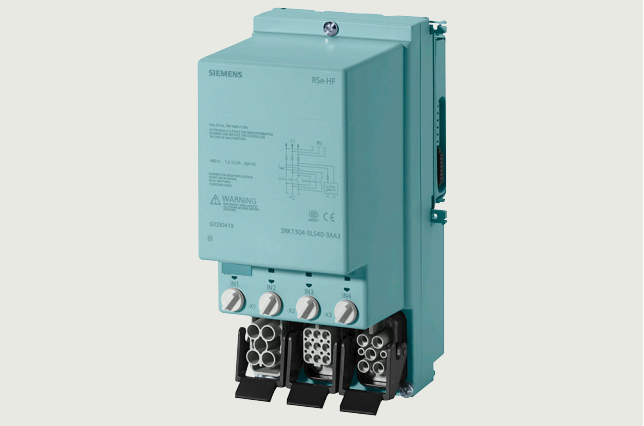
[1] Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see Accessories for ET 200pro motor starters)

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Overview

For the functionality, device functions and technical specifications of the High Feature motor starter, see ET 200pro motor starters.

The High Feature motor starter differs from the Standard motor starter in having more parameters and four integrated, freely-configurable digital inputs.



High Feature motor starters, mechanical: Reversing starters RSe



High Feature motor starters, electronic: Reversing starters sRSSte

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Selection and ordering data

	Version	Setting range Rated operational current	Article No.
High Feature motor starters, mechanical Motor protection: thermal model			
 RSe High Feature	**Direct-on-line starters DSe** [1]		
	• Without brake output and with 4 inputs	0.15 ... 2 A	**3RK1304-5KS40-2AA0**
	• With brake output 400 V AC and 4 inputs		**3RK1304-5KS40-2AA3**
	• Without brake output and with 4 inputs	1.5 ... 12 A	**3RK1304-5LS40-2AA0**
	• With brake output 400 V AC and 4 inputs		**3RK1304-5LS40-2AA3**
	Reversing starters RSe [1]		
	• Without brake output and with 4 inputs	0.15 ... 2 A	**3RK1304-5KS40-3AA0**
	• With brake output 400 V AC and 4 inputs		**3RK1304-5KS40-3AA3**
	• Without brake output and with 4 inputs	1.5 ... 12 A	**3RK1304-5LS40-3AA0**
	• With brake output 400 V AC and 4 inputs		**3RK1304-5LS40-3AA3**
High Feature motor starters[2], electronic Full motor protection, comprising thermal motor protection and thermistor motor protection			
 sRSSte High Feature	**Direct-on-line starters sDSSte/sDSte** [1][2]		
	• Without brake output and with 4 inputs	0.15 ... 2 A	**3RK1304-5KS70-2AA0**
	• With brake output 400 V AC and 4 inputs		**3RK1304-5KS70-2AA3**
	• Without brake output and with 4 inputs	1.5 ... 12 A	**3RK1304-5LS70-2AA0**
	• With brake output 400 V AC and 4 inputs		**3RK1304-5LS70-2AA3**
	Reversing starters sRSSte/sRSte [1][2]		
	• Without brake output and with 4 inputs	0.15 ... 2 A	**3RK1304-5KS70-3AA0**
	• With brake output 400 V AC and 4 inputs		**3RK1304-5KS70-3AA3**
	• Without brake output and with 4 inputs	1.5 ... 12 A	**3RK1304-5LS70-3AA0**
	• With brake output 400 V AC and 4 inputs		**3RK1304-5LS70-3AA3**

1) Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see Accessories for ET 200pro motor starters)

2) The electronic motor starters can be used not only as electronic motor starters with a high level of switching frequency but also as full-fledged soft starters for soft starting and stopping. The changeover from motor starter to soft starter takes place through reparameterization in HW Config.
Depending on the setting, this results in the following current ranges:
- Parameterization as electronic motor starter: 0.15 to 2 A and 1.5 to 9 A (4 kW).
- Parameterization as soft starter: 0.15 to 2 A and 1.5 to 12 A (5.5 kW).

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Overview

The isolator module with integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters) and switch disconnector function is used for safe disconnection of the 400 V operational voltage during repair work in the plant.

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

The following properties apply to the isolator module:

- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free design thanks to high degree of protection IP65

Selection and ordering data

Version	Article No.
ET 200pro isolator modules, mechanical	
 3RK1304-0HS00-6AA0	**Isolator module** [1] Rated operational current 25 A — **3RK1304-0HS00-6AA0**

[1] Only functions when used together with the related 110 mm backplane bus module and the wide module rack. The backplane bus module 3RK1922-2BA00 and the wide module racks 6ES7194-4GB.. and 6ES7194-4GD.. must be ordered separately.

Technical specifications

Type		Isolator modules
General data		
Mounting dimensions (W x H x D)		
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170
Permissible ambient temperature		
• During operation	°C	-25 ... +55
• During storage	°C	-40 ... +70
Permissible mounting position		Any
Vibration resistance acc. to IEC 60068-2-6	*g*	2
Shock resistance acc. to IEC 60068-2-27	*g*/-ms	Half-sine 15/11
Power consumption		
• From auxiliary circuit L+/M (U1)	mA	Approx. 40
• From auxiliary circuit A1/A2 (U2)		--
Rated operational current I_e for power bus	A	25
Rated operational voltage U_e	V AC	400
Approvals according to		
• DIN VDE 0106, Part 101	V	Up to 500
• CSA and UL	V	Up to 600
Conductor cross-sections		
• Incoming power supply	mm^2	Max. 6 x 4
Degree of protection		IP65
Touch protection		Finger-safe
Pollution degree		3, IEC 60664 (IEC 61131)
Rated impulse withstand voltage U_{imp}	kV	6
Rated insulation voltage U_i	V	400
Rated operational current I_e for starters		
• AC-1, AC-2, AC-3 at 40 °C		
- At 400 V	A	25
- At 500 V	A	25
Rated short-circuit breaking capacity	kA	50 at 400 V
Type of coordination according to IEC 60947-4-1		2
Protective separation between main and auxiliary circuits	V	400, according to DIN VDE 0106, Part 101
Device functions		
• Group diagnostics		Yes, configurable
Device indications		
• Group fault		SF LED (red)

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Overview

PROFIsafe Safety Solution

With the PROFIsafe Safety modules

- F-Switch and
- 400 V disconnecting module

with an appropriate connection, safety levels SIL 3 (according to IEC 62061) or PL e (according to ISO 13849-1) can be achieved.

PROFIsafe F-Switch

Fail-safe digital inputs/outputs in degrees of protection IP65 to IP67 for cabinet-free use near the machine.

Fail-safe digital inputs

- For the fail-safe reading in of sensor information (1-/2-channel)
- Including integrated discrepancy evaluation for 2v2 signals
- Internal sensor supplies (including testing) available

Fail-safe digital outputs

- Three fail-safe PP-switching outputs for safe switching of the backplane busbars

The F-Switch is certified up to SIL 3/PL e and has detailed diagnostics.

It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

Note:

Safety characteristics, see https://support.industry.siemens.com/cs/ww/en/view/109739348

Functionality

The PROFIsafe F-Switch is a fail-safe electronic module for PROFIsafe Safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane busbars. In combination with the 400 V disconnecting module, fail-safe shutdown of ET 200pro motor starters is possible in PROFIsafe applications up to SIL 3/PL e.

400 V disconnecting module

The 400 V disconnecting module enables the safe disconnection of an operational voltage of 400 V up to SIL 3/PL e. For operation in a PROFIsafe Safety application it functions only in combination with the F-Switch.

Functionality

The 400 V disconnecting module can be used together with the F-Switch for PROFIsafe Safety applications. It contains two contactors connected in series for safety-related disconnection of the main circuit. The auxiliary circuit supply of the device is provided via a safety power rail in the backplane bus module. The 400 V disconnecting module can be used in conjunction with the F-Switch for safety applications up to SIL 3/PL e.

Selection and ordering data

	Version	Article No.
PROFIsafe Safety modules		
 3RK1304-0HS00-8A-A0	**400 V disconnecting module** [1)2)] Rated operational current 25 A	**3RK1304-0HS00-8AA0**
 6ES7148-4FS00-0AB-0	**PROFIsafe F-Switch** 24 V DC, including bus module Note: Connection module must be ordered separately.	**6ES7148-4FS00-0AB0**
	Connection module for F-Switch 24 V DC	**6ES7194-4DA00-0AA0**

1) The 400 V disconnecting module functions only when used together with the PROFIsafe F-Switch.
2) The 400 V disconnecting module only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see Accessories for ET 200pro motor starters)

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Technical specifications

Type		400 V disconnecting module
General data		
Mounting dimensions (W x H x D)		
• Direct-on-line starters and reversing starters	mm	110 x 230 x 150
Permissible ambient temperature		
• During operation	°C	-25 ... +55
• During storage	°C	-40 ... +70
Permissible mounting position		Any
Vibration resistance acc. to IEC 60068-2-6	*g*	2
Shock resistance according to IEC 60068-2-27	*g*/-ms	Half-sine 15/11
Power consumption		
• From auxiliary circuit L+/M (U1)	mA	Approx. 20
• From auxiliary circuit A1/A2 (U2)		--
Rated operational current I_e for power bus	A	25
Rated operational voltage U_e	V AC	400 (50/60 Hz)
Approval acc. to DIN VDE 0106, Part 101	V	Up to 500
Approval according to CSA and UL	V	Up to 600
Conductor cross-sections		
Incoming power supply	mm^2	Max. 6 x 4
Degree of protection		IP65
Touch protection		Finger-safe
Pollution degree		3, IEC 60664 (IEC 61131)
Rated impulse withstand voltage U_{imp}	kV	6
Rated insulation voltage U_i	V	400
Rated operational current I_e for starters		
• AC-1, AC-2, AC-3 at 40 °C		
- At 400 V	A	25
- At 500 V	A	25
Rated short-circuit breaking capacity	kA	50 at 400 V
Type of coordination according to IEC 60947-4-1		2
Protective separation between main and auxiliary circuits	V	400, according to DIN VDE 0106, Part 101
Operating times for 0.85 ... 1.1 x U_e		
• Closing delay	ms	25 ... 100
• Opening delay	ms	7 ... 10
Device functions		
• Group diagnostics		Yes, configurable
Device indications		
• Group fault		SF LED (red)

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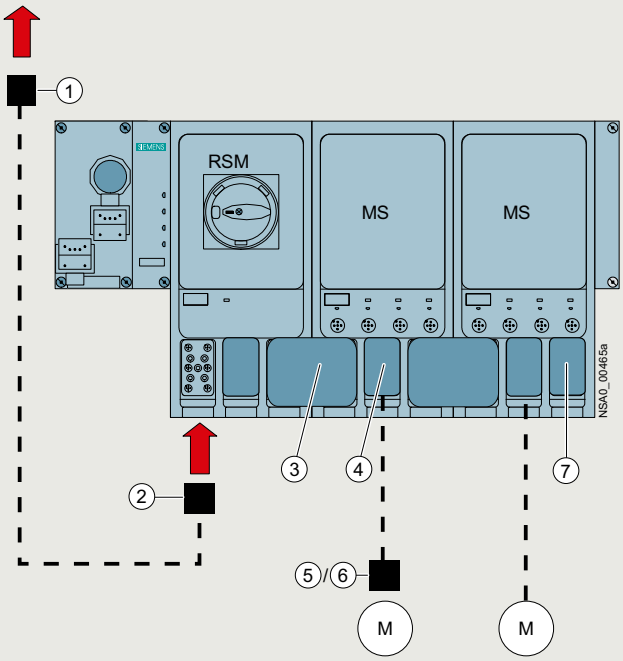
Technical specifications

Article number	3RK1304-0HS00-8AA0
General data	
width × height × depth	110 mm × 230 mm × 157.5 mm
ambient temperature	
• during operation	-25 ... +55
• during storage	-40 ... +70
mounting position	any
vibration resistance	2 g
shock resistance	15 g / 11 ms
consumed current / for rated value of supply voltage	
• at switching on of motor	300 mA
• during operation	300 mA
operational current / at AC / at 400 V / rated value	25 A
operating voltage / rated value	200 ... 400
operating voltage / at AC / at 60 Hz / according to CSA and UL / rated value	600 V
protection class IP	IP65
touch protection against electrical shock	finger-safe
degree of pollution	3
surge voltage resistance / rated value	6 kV
insulation voltage / rated value	400 V
operational current	
• at AC-3 / at 400 V / rated value	25 A
• at AC-3e / at 400 V / rated value	25 A
maximum short-circuit current breaking capacity (Icu)	
• at 400 V / rated value	NO_DATA
• at 500 V / according to UL 60947 / rated value	NO_DATA
at 600 V	
- rated value	NO_DATA
- according to UL 60947 / rated value	NO_DATA
type of coordination	1
maximum permissible voltage for protective separation / between main and auxiliary circuit	400 V

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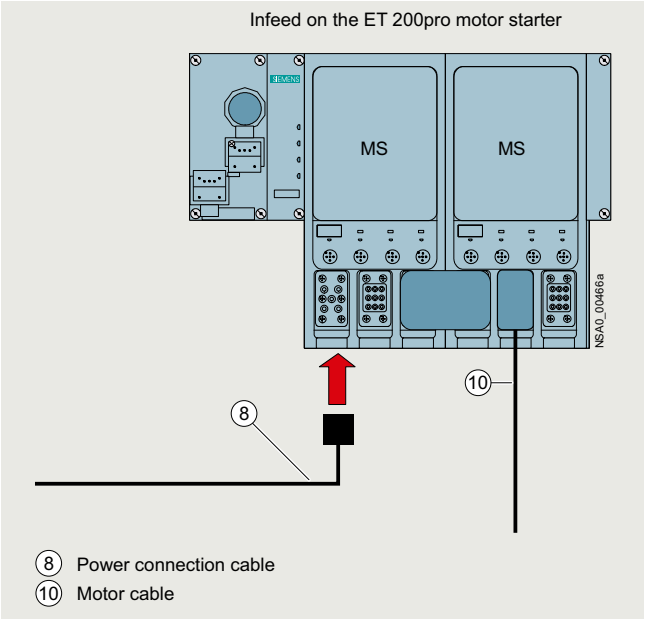
Overview

Overview



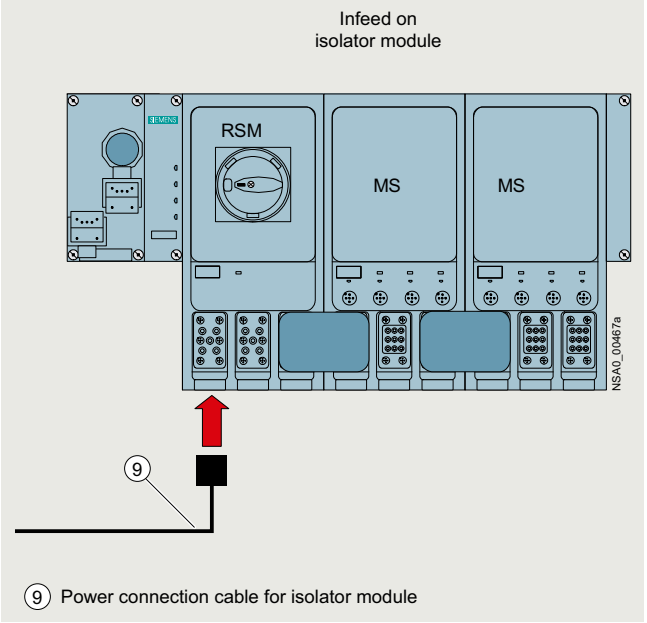
1 Power feeder plug
2 Power connection plug
3 Power jumper plug
4 Motor connection plug
5 Motor plug
6 Motor plug with EMC suppressor circuit
7 Power loop-through plug

Basic design of an ET 200pro version with (from the left) connection module for IM, interface module for communication (IM), RSM isolator module, two ET 200pro motor starters (MS), and connections for energy



8 Power connection cable
10 Motor cable

Infeed on the ET 200pro motor starter



9 Power connection cable for isolator module

Infeed on the RSM isolator module

Power bus

The power supply to the field devices (ET 200pro motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

Feeders

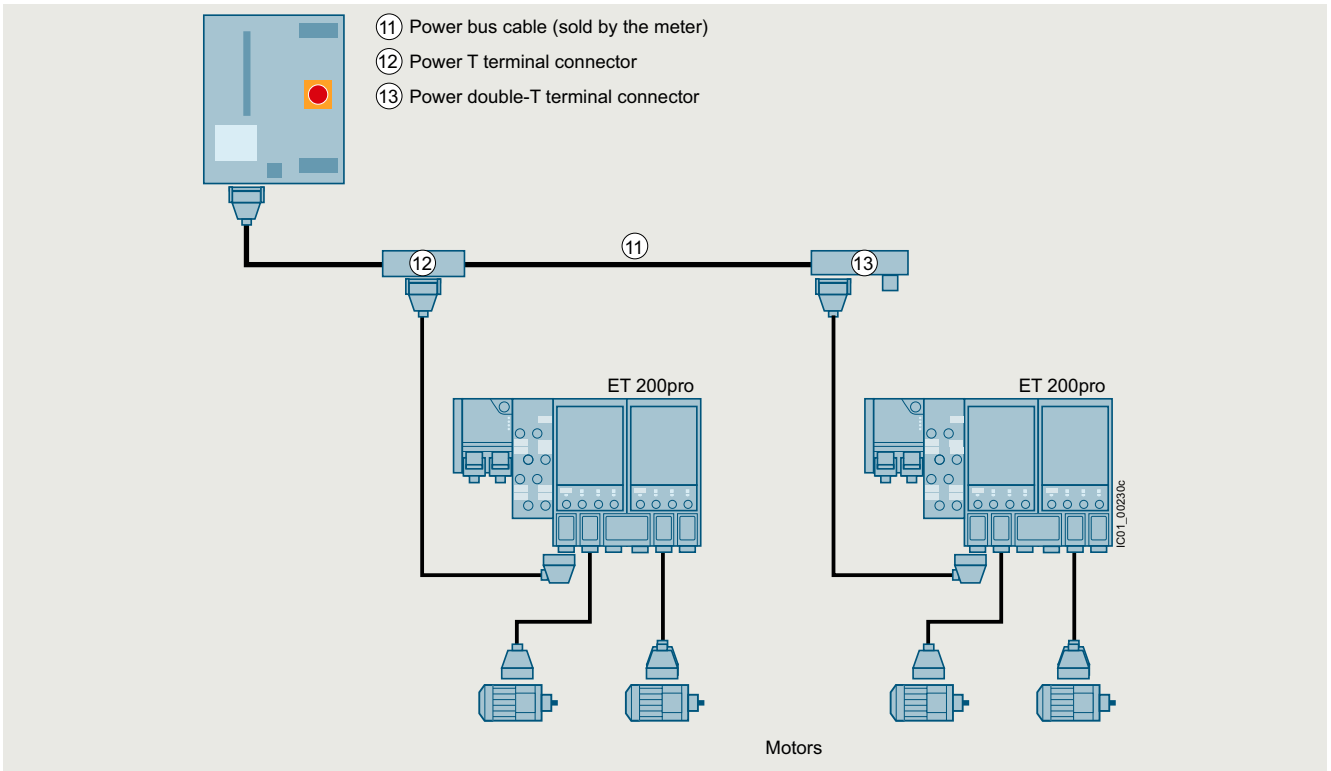
From the terminal connectors, spur lines with Han Q4/2 plugs lead to the field devices, from which the motors are supplied with power via motor connection cables.

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Overview (continued)

Interruption-free thanks to power terminal connectors

In finger-safe connection technology the power T terminal connectors and power double-T terminal connectors connect the components of a feeder to the power bus. They ensure interruption-free operation, i.e. the power bus is not interrupted when the components are unplugged.



Power supply to the motors via the power bus with power T and double-T terminal connectors linked by power bus cables, spur lines to the field devices (motor starters), and power loop-through connections to the motors via motor connection cables

Motor control via PROFIBUS

The interface modules (IM) for PROFIBUS can be combined with two different connection modules for connecting PROFIBUS DP and the power supply:

- Direct connection with cable gland
- M12, 7/8" connection
  - with M12 connecting cable and M12 plugs for data transmission with PROFIBUS DP
  - with 7/8" connecting cable and 7/8" plugs for the power supply

For connection modules with the relevant accessories, see IM 154-1 and IM 154-2 interface modules.

Motor control via PROFINET

For connection modules with the relevant accessories, see IM 154-3 PN and IM 154-4 PN interface modules.

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Selection and ordering data

Version	Article No.
Incoming power supply	
(1) Power feeder plug	
Connector set for incoming power supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for Han Q4/2, including screw gland	
• 5 contact pins, 2.5 mm²	**3RK1911-2BS60**
• 5 contact pins, 4 mm²	**3RK1911-2BS20**
• 5 contact pins, 6 mm²	**3RK1911-2BS40**
(2) Power connection plug	
Connector set for incoming power supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angled outgoing feeder, socket insert for Han Q4/2, including screw gland	
• 5 contact sockets, 2.5 mm²	**3RK1911-2BE50**
• 5 contact sockets, 4 mm²	**3RK1911-2BE10**
• 5 contact sockets, 6 mm²	**3RK1911-2BE30**
(8) Power connecting cables, assembled at one end	
• Power connecting cable for ET 200pro motor starters, for Han Q4/2, angled, 4 x 4 mm²	
- Length 1.5 m	**3RK1911-0DB13**
- Length 5 m	**3RK1911-0DB33**
• Power connecting cable for ET 200pro motor starters, with "N" and pin 11 and 12 jumper for plug monitoring, for Han Q4/2, angled, 5 x 4 mm²	
- Length 1.5 m	**3RK1911-0DC13**
- Length 5 m	**3RK1911-0DC33**
(9) Power connecting cables for isolator module, assembled at one end	
Power connecting cable for ET 200pro isolator modules, for Han Q4/2, angled, insert turned at isolator module end, 4 x 4 mm²	
• Length 1.5 m	**3RK1911-0DF13**
• Length 5 m	**3RK1911-0DF33**
Power loop-through on the field device	
(3) Power jumper plug	**3RK1922-2BQ00**
(7) Power loop-through plug	
Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angled outgoing feeder, pin insert for Han Q4/2, including screw gland	
• 4 contact pins, 2.5 mm²	**3RK1911-2BF50**
• 4 contact pins, 4 mm²	**3RK1911-2BF10**
Motor cables	
(4) Motor connection plug	
Connector set for motor cable for connection to ET 200pro motor starters, comprising a cable-end connector hood, angled outgoing feeder, pin insert for Han Q8/0, including screw gland	
• 8 contact pins, 1.5 mm²	**3RK1902-0CE00**
• 6 contact pins, 2.5 mm²	**3RK1902-0CC00**
(5) Motor plug	
Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, socket insert for Han 10e, including neutral bridge, including screw gland	
• 7 contact sockets, 1.5 mm²	**3RK1911-2BM21**
• 7 contact sockets, 2.5 mm²	**3RK1911-2BM22**
(6) Motor plugs with EMC suppressor circuit	
Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, socket insert for Han 10e with EMC suppressor circuit, including neutral bridge, including screw gland	
• 7 contact sockets, 1.5 mm²	**3RK1911-2BL21**

Selection and ordering data (continued)

Version	Article No.
• 7 contact sockets, 2.5 mm²	**3RK1911-2BL22**
(10) Motor cables, assembled at one end	
For connection to ET 200pro motor starters, Han Q8/0, angled, length 5 m	
• For motor without brake	
- Without thermistor, 4 x 1.5 mm²	**3RK1911-0EB31**
- With thermistor, 6 x 1.5 mm²	**3RK1911-0EF31**
• For motor with brake, brake voltage 400 V AC or 180 V DC	
- Without thermistor, 6 x 1.5 mm²	**3RK1911-0ED31**
- With thermistor, 8 x 1.5 mm²	**3RK1911-0EG31**
• For motor with brake, brake voltage 230 V AC	
- Without thermistor, 6 x 1.5 mm2	**3RK1911-0EH31**
- With thermistor, 8 x 1.5 mm²	**3RK1911-0EE31**
Power bus	
(12) Power T terminal connectors	
For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments	
• 2.5 mm² /4 mm²	**3RK1911-2BF01**
• 4 mm² /6 mm²	**3RK1911-2BF02**
(13) Power double-T terminal connectors	
For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments, connection of two motor starters possible	
• 4 mm² /6 mm²	**3RK1911-2BG02**
Sealing set (comprising 2 seals)	
For power T/power double-T terminal connectors	
• For power cables with Ø 10 ... 13 mm	**3RK1911-5BA00**
• For power cables with Ø 13 ... 16 mm	**3RK1911-5BA10**
• For power cables with Ø 16 ... 19 mm	**3RK1911-5BA20**
• For power cables with Ø 19 ... 22 mm	**3RK1911-5BA30**
• Blanking plug	**3RK1911-5BA50**
Further accessories for power connections	
Crimping tool	**3RK1902-0CW00**
For pins/sockets 4 mm²and 6 mm²	
Dismantling tools	
• For contact pins and sockets for 9-pole Han Q4/2 inserts	**3RK1902-0AB00**
• For contact pins and sockets for 9-pole Han Q8 inserts	**3RK1902-0AJ00**
Sealing caps	
For 9-pole power sockets	
• 1 unit per pack	**3RK1902-0CK00**
• 10 units per pack	**3RK1902-0CJ00**
Further accessories	
Module racks, wide [1]	
• Length 500 mm	**6ES7194-4GB00-0AA0**
• Length 1 000 mm	**6ES7194-4GB60-0AA0**
• Length 2 000 mm	**6ES7194-4GB20-0AA0**
Module racks, wide, compact [1]	
• Length 500 mm	**6ES7194-4GD00-0AA0**
• Length 1 000 mm	**6ES7194-4GD10-0AA0**
• Length 2 000 mm	**6ES7194-4GD20-0AA0**
Backplane bus module 110 mm [2]	**3RK1922-2BA00**
Handheld devices	**3RK1922-3BA00**

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Selection and ordering data (continued)

Version	Article No.
For ET 200pro motor starters for local control	
Notes: • The motor-starter-specific serial interface cables must be ordered separately. • The RS 232 interface cable 3RK1922-2BP00 is used for the ET 200pro motor starters.	
RS 232 interface cables	**3RK1922-2BP00**
Serial data connection between ET 200pro motor starter and handheld device 3RK1922-3BA00	
M12 sealing caps	**3RK1901-1KA00**
For sealing unused M12 input or output sockets (one set contains ten sealing caps)	
Motor suppression modules	
RC element for installation in motor terminal box	
• Angled design	**3RK1911-6EA00**
• Round design	**3RK1911-6EB00**

1) The wide module rack can accommodate all ET 200pro motor starters and any optional modules (isolator module, 400 V disconnecting module).
2) The backplane bus module is a prerequisite for operation of ET 200pro motor starters and optional modules.

For more connection technology products, see https://support.industry.siemens.com/cs/ww/en/view/65355810.

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Overview



SIMATIC ET 200pro FC-2 frequency converter

The SIMATIC ET 200pro FC-2 frequency converter has the design of a SIMATIC ET 200pro module. It supplements the SIMATIC ET 200pro system range with distributed, speed-controlled drives. It is suitable for the open-loop and closed-loop control of asynchronous (induction) motors in a wide range of industrial applications. It is predestined for conveyor technology applications using drives networked via PROFIBUS and PROFINET, in particular in distributed designs without control cabinet with high degree of protection (IP65), when combining several drives. The modular, service-friendly concept is ideally suited to manufacturing processes with high plant standstill costs.

Reasons for using distributed drive systems

- Modular drive solutions – therefore standardized mechatronic elements that can be individually tested
- A control cabinet is not required, resulting in a smaller space requirement and lower cooling requirements
- Long motor cables between converter and motor are not required
  - Less power losses
  - Reduced noise radiation
  - Reduced costs for shielded cables
  - No additional filters
- Distributed configurations offer considerable benefits for conveyor systems with their extensive coverage (e.g. in the automotive and logistics sectors)

Siemens family of distributed drives

Siemens offers an innovative portfolio of frequency converters to optimally implement distributed drive solutions. The strengths of the individual members of the drive family permit simple adaptation to the widest range of application demands:

- Identical connection systems
- User-friendly commissioning and configuration tools

Products from the family of distributed drives:

- SINAMICS G115D distributed converters
- SINAMICS G120D frequency converters
- SIMATIC ET 200pro FC-2 frequency converters
- SIRIUS M200D motor starters

Overview (continued)

Safety Integrated

The distributed SIMATIC ET 200pro FC-2 frequency converters are already equipped with the integrated STO (Safe Torque Off) safety function, certified in accordance with IEC 61508 SIL 2 as well as ISO 13849-1 PL d and Category 3. It can be activated locally via the F-RSM or by means of PROFIsafe.

STARTER commissioning tool

The STARTER commissioning tool (V4.4 and higher) plus the corresponding SINAMICS Support Package (SSP) supports the commissioning and maintenance of SIMATIC ET 200pro FC-2 frequency converters.

The operator guidance combined with comprehensive, user-friendly functions for the relevant drive solution allow you to commission the device quickly and easily.

Engineering Framework STEP7 classic (V5.5 and higher)

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in STEP7 classic.

Engineering Framework TIA Portal (as from V13 SP1)

TIA Portal is a powerful engineering framework providing full access to the whole digitized automation.

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in TIA Portal.

Selection and ordering data

	Article No.
SIMATIC ET 200pro FC-2 frequency converter with integrated safety function STO (Safe Torque Off)	**6SL3514-1KE13-5AE0**
Backplane bus module for mounting the frequency converter (absolutely essential for operation of the converter)	**6SL3260-2TA00-0AA0**

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Accessories

IOP-2 Handheld Intelligent Operator Panel



IOP-2 Handheld for mobile use

The IOP-2 Handheld Intelligent Operator Panel is a very user-friendly and powerful operator panel for commissioning and diagnostics as well as local operator control and monitoring of SINAMICS G120D and SIMATIC ET 200pro FC-2 distributed converters.

The IOP-2 Handheld supports both newcomers and drive experts. Thanks to the membrane keyboard with a central sensor control field, the high-contrast color displays, the menu-based operation and the application wizards, it is easy to commission standard drives. A drive can be essentially commissioned without having to use a printed parameter list – as the parameters are displayed in plain text, and explanatory help texts and a parameter filtering function are provided.

Application wizards interactively guide you when commissioning important applications such as conveyor technology, pumps, fans and compressors. There is a basic commissioning wizard for general commissioning.

Up to two process values can be graphically visualized and up to four process values can be numerically visualized on the status screen/display. Process values can also be displayed in technological units.

The IOP-2 Handheld supports series commissioning of identical drives. For this purpose, a parameter list can be copied from a frequency converter into the IOP-2 Handheld and downloaded into other drive units of the same type as required.

In addition to the IOP-2, the IOP-2 Handheld includes a housing with rechargeable batteries, a charging unit, an RS232 connecting cable, and a USB cable. The charging unit is supplied with connector adapters for Europe, the US and UK. When the batteries are fully charged, the operating time is up to 10 hours.

To connect the IOP-2 Handheld to SINAMICS G120D and SIMATIC ET 200pro FC-2, the RS232 connecting cable with optical interface is required in addition.

Updating the IOP-2 Handheld

The IOP-2 Handheld can be updated and expanded using the integrated USB interface.

Data to support future drive systems can be transferred from the PC to the IOP-2 Handheld. Further, the USB interface allows user languages and wizards that will become available in the future to be subsequently downloaded and the firmware to be updated for the IOP-2 Handheld [1].

[1] Information on updates for the IOP-2 Handheld is available at https://support.industry.siemens.com/cs/document/67273266

Accessories (continued)

Description	Article No.
IOP-2 Handheld For use with SINAMICS G120 SINAMICS G120C SINAMICS G120P SINAMICS G120D SIMATIC ET 200pro FC-2 Included in the scope of delivery: • IOP-2 • Handheld housing • Rechargeable batteries (4 × AA) • Charging unit (international) • RS232 connecting cable 3 m (9.84 ft) long, can be used in combination with SINAMICS G120 SINAMICS G120C SINAMICS G120P • USB cable 1 m (3.28 ft) long	**6SL3255-0AA00-4HA1**
RS232 connecting cable 2.5 m (8.20 ft) long, with optical interface for connecting the IOP-2 Handheld to SINAMICS G120D SIMATIC ET 200pro FC-2	**3RK1922-2BP00**

	IOP-2 Handheld 6SL3255-0AA00-4HA1
Display	High-contrast color display, a variety of display options
• Resolution	320 × 240 pixels
Operator panel	Membrane keyboard with central sensor control field
Operating languages	English, German, French, Italian, Spanish, Portuguese, Dutch, Swedish, Finnish, Russian, Czech, Polish, Turkish, Chinese Simplified
Ambient temperature	
• During transport and storage	-20 ... +55 °C (-4 ... +131 °F)
• During operation	0 ... 40 °C (32 ... 104 °F)
Humidity	Relative humidity < 95 %, non-condensing
Degree of protection	IP20
Dimensions (H × W × D)	195.04 × 70 × 37.58 mm (7.68 × 2.76 × 1.48 in)
Weight, approx.	0.724 kg (1.6 lb)
Compliance with standards	CE, UKCA, RCM, cULus, EAC, KC-REM-S49-SINAMICS

Memory cards



SINAMICS SD memory card

The parameter settings of the converter and the firmware can be stored on the optional SINAMICS SD memory card. When service is required, the data are automatically downloaded from the memory card in the converter and the system is ready for use again without further interventions.

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Accessories (continued)

- Parameter settings can be written from the memory card to the converter or saved from the converter to the memory card.
- Up to 100 parameter sets can be stored.
- The memory card supports series commissioning without the use of the Intelligent Operator Panel IOP-2 Handheld or the STARTER commissioning tool.
- If firmware is stored on the memory card and a Control Unit is installed, the firmware can be upgraded/downgraded during power-up [1)]

Note:

The memory card is optional, but it facilitates converter replacement.

1) You can find more information about firmware upgrades/downgrades on the internet at https://support.industry.siemens.com/cs/document/67364620

Description	Article No.
SINAMICS SD card 512 MB	**6SL3054-4AG00-2AA0**
Optional firmware memory cards	
SINAMICS SD card 512 MB + firmware V4.7 SP13 (Multicard V4.7 SP13)	**6SL3054-7TG00-2BA0**
SINAMICS SD card 512 MB + firmware V4.7 SP14 (Multicard V4.7 SP14)	**6SL3054-7TH00-2BA0**

More information on firmware V4.7 SP14:
https://support.industry.siemens.com/cs/document/109817231

For an overview and more information on all available firmware versions, see
https://support.industry.siemens.com/cs/document/67364620

STARTER commissioning tool

The STARTER commissioning tool (V4.4 and higher) plus SSP supports the commissioning and maintenance of SIMATIC ET 200pro FC-2 frequency converters. The operator guidance combined with comprehensive, user-friendly functions for the relevant drive solution allow you to commission the device quickly and easily.

Description	Article No.
STARTER commissioning tool [1)] on DVD-ROM	**6SL3072-0AA00-0AG0**

1) The STARTER commissioning tool is also available on the internet at www.siemens.com/starter

PC converter connection kit 2

The mini USB interface cable is used to control and commission a converter directly from a PC via a point-to-point connection if the appropriate software (STARTER commissioning tool version 4.4 and higher, plus SSP) has been installed.

Description	Article No.
PC converter connection kit 2 Mini USB interface cable for communication with a PC, 3 m (9.84 ft) long	**6SL3255-0AA00-2CA0**

Accessories (continued)

Connecting cables pre-assembled at one end and connector sets to connect to the line supply

Description	Article No.
Connecting cable pre-assembled at one end Power supply cable, open at one end, for Q4/2, angled, 4 × 4 mm²	
• 1.5 m (4.92 ft) long	**3RK1911-0DB13**
• 5 m (16.4 ft) long	**3RK1911-0DB33**
Connector set for the power supply Q4/2	
• 2.5 mm²	**3RK1911-2BE50**
• 4 mm²	**3RK1911-2BE10**
• 6 mm²	**3RK1911-2BE30**

Motor cables pre-assembled at one end and connector sets to connect the converter to the motor

Motor cables pre-assembled at one end for motors with brake and temperature sensor with Q8 plug, shielded Cross-section	Article No. 4 × 1.5 mm² 2 × (2 × 0.75 mm²)
• 1.5 m (4.92 ft) long	**6FX8002-5DT11-1AB5**
• 3 m (9.84 ft) long	**6FX8002-5DT11-1AD0**
• 5 m (16.4 ft) long	**6FX8002-5DT11-1AF0**
• 10 m (32.8 ft) long	**6FX8002-5DT11-1BA0**
Connector set for motor cable Q8, shielded	**6FX2003-1HD10**

Power jumper plugs

The power jumper plug is used for 400 V power transmission to following 400 V modules.

Description	Article No.
Power jumper plugs	**3RK1922-2BQ00**

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Technical specifications

Distributed frequency converter	SIMATIC ET 200pro FC-2
Selection features	
Integrated safety functions acc. to IEC 61508 SIL 2 and ISO 13849-1 PL d and Category 3	• Safe Torque Off (STO) • Control of the integrated safety function via the Safety Local isolator module F-RSM or via F-Switch PROFIsafe
Electrical specifications	
Line voltage	380 ... 480 V 3 AC ±10 %
Power	
• With an ambient temperature of 0 ... 55 °C (32 °F ... 131 °F)	1.1 kW
• With an ambient temperature of 0 ... 45 °C (32 °F ... 113 °F)	1.5 kW
Rated input current/output current	
• With an ambient temperature of 0 ... 55 °C (32 °F ... 131 °F)	2 A/3.5 A
• With an ambient temperature of 0 ... 45 °C (32 °F ... 113 °F)	2.5 A/3.9 A
Line frequency	47 ... 63 Hz
Overload capability	• Overload current 1.5 x rated output current (i.e. 150 % overload) for 60 s, cycle time 300 s • Overload current 2 x rated output current (i.e. 200 % overload) for 3 s, cycle time 300 s
Output frequency	0 ... 550 Hz
Pulse frequency	4 kHz (standard), 4 ... 16 kHz (in 2-kHz increments)
Standard SCCR (Short Circuit Current Rating)	10 kA
Skipped frequency range	1, parameterizable
Converter efficiency	95 ... 97 %
Interfaces	• Connection to PROFIBUS and PROFINET over the SIMATIC ET 200pro backplane bus • Mini USB interface for commissioning via PC (as from STARTER V4.4 plus SSP) • Optical interface for commissioning via the IOP-2 Handheld • Slot for an optional memory card (SD) for uploading or downloading parameter settings. Facilitates easy device replacement. • PTC, bimetal, KTY84, Pt1000 interface for motor temperature monitoring
Functions	
Open-loop/closed-loop control methods	• V/f control – linear ($M \sim n$) with/without flux current control (FCC), quadratic ($M \sim n^2$) or parameterizable • Vector control – sensorless • Closed-loop torque control
Operating functions	• Jogging • BICO technology • Automatic restart following interruptions in operation due to a power failure • Smooth connection of converter to rotating motor
Braking functions	• Integrated regenerative feedback functionality • Control of an electromagnetic holding brake Integrated brake control supplies DC power supply to the brake Line voltage: 380 V AC / 400 V AC / 440 V AC / 480 V AC Rectified brake voltage: 171 V DC / 180 V DC / 198 V DC / 216 V DC Recommended brake coil voltage for Siemens motors: 170 ... 200 V DC / 170 ... 200 V DC, 184 ... 218 V DC / 184 ... 218 V DC / 184 ... 218 V DC Disconnection on the DC side permits "fast" braking.
Protection functions	• Undervoltage • Overvoltage • Ground fault • Short-circuit • Stall protection • Thermal motor protection (I^2t or sensor) • Converter overtemperature • Motor blocking protection • Phase failure detection
Connectable motors	• Low-voltage asynchronous (induction) motors • Motor cable lengths: max. 15 m (49 ft) (shielded)
Mechanical specifications	
Degree of protection	IP65
Operating temperature	0 ... 55 °C (32 ... 131 °F)

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Technical specifications (continued)

Distributed frequency converter	SIMATIC ET 200pro FC-2
Mounting position	Vertical wall mounting (vertical alignment of the cooling fins)
Dimensions (W × H × D)	155 mm × 246 mm × 248 mm (6.10 in × 9.69 in × 9.76 in)
Weight, approx.	4 kg (8.8 lb)
Standards	
Certificates of suitability	UL508C, cUL, CE, UKCA, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU

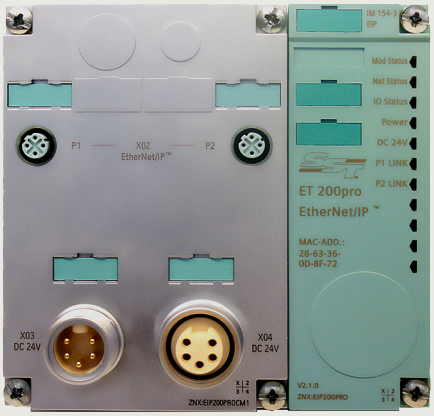
More information

A comprehensive range of supplementary products is provided for the distributed drive technology, e.g. pre-assembled cables and connectors. An overview is provided at the following link:
www.siemens.com/distributeddrives-supplementaryproducts

For more information about the connecting cables and plug-in connectors, please refer to Catalog IK PI.

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Overview



An interface module (EtherNet/IP adapter) is available for operating ET 200pro on EtherNet/IP. It can be used together with system and IO components of the ET 200pro distributed I/O system.

Selection and ordering data

SIMATIC ET 200pro interface module for EtherNet/IP Including: • Bus terminating module for ET 200pro • Companion disk with the manuals and the Configuration Tool	**ZNX:EIP200PRO**
Terminal module for EtherNet/IP For connecting the interface module to EtherNet/IP	**ZNX:EIP200PROCM1**

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Technical specifications

Article number	ZNX:EIP200PRO Ethernet/IP Head Assembly for ET 200PRO
General information	
Product type designation	Ethernet/IP
Supply voltage	
Rated value (DC)	24 V
Input current	
from supply voltage 1L+, max.	400 mA
Address area	
Addressing volume	
• Inputs	255 byte
• Outputs	255 byte
Interface types	
M12 port	
• Autonegotiation	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	No
PROFIsafe	No
PROFIBUS	No
EtherNet/IP	Yes
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• For load voltage monitoring	Yes
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Dimensions	
Width	135 mm
Height	130 mm
Depth	59.3 mm
Weights	
Weight, approx.	490 g

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Overview



SIMATIC ET 200AL video



- Modular, distributed I/O system with compact I/O modules in IP65/67.
- Especially easy and flexible installation, even in extremely confined spaces.
- Easy wiring
- Easy commissioning
- SIMATIC ET 200AL consists of the following components:
  - Interface module for communication with IO controllers using the Ethernet-based protocols PROFINET, EtherNet/IP and Modbus TCP (MultiFieldbus).
  - Interface module for communication with IO controllers on PROFINET.
  - Interface module for communication with all masters on the PROFIBUS.
  - BusAdapter for connection to the ET 200SP I/O system.
  - Various I/O modules, 30 mm and 45 mm wide.
  - IO-Link I/O modules for connection to IO-Link Master
- Maximum configuration of an ET 200AL station:
  - Up to 32 I/O modules with PROFINET or PROFIBUS in any combination
  - Up to 16 I/O modules at the ET 200SP I/O system in any combination
- Connection of the modules via an internal backplane bus established using bus cables (ET connection).

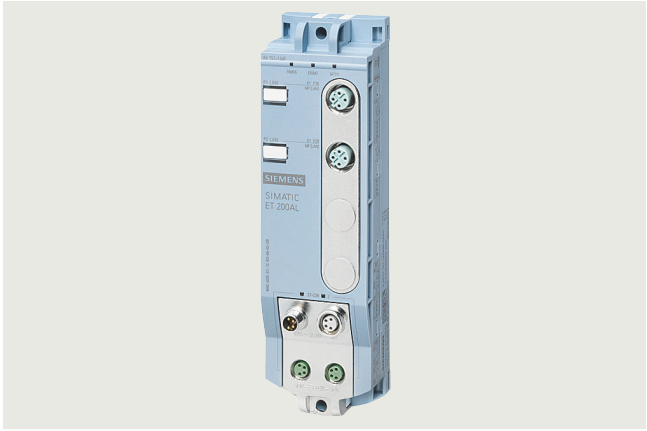
Overview (continued)

Highlights

- Compact dimensions
- Low weight
- Safety-related collective shutdown of the outputs
- High degree of user-friendliness due to the following design features:
  - Flexible mounting in all positions possible due to screw fastening through the front or side
  - Direct installation on even surfaces or aluminum DIN rails
  - Labels for the identification of channels, modules and slots
  - Integrated cable tie opening
  - Clear and CAx-compliant interface designations
  - Uniform coloring of the system interfaces and system cables
  - 1:1 assignment of LED channel state, I/O socket and labeling strip
  - Pin assignment on the side
- I/O module portfolio comprising digital and analog modules, digital fail-safe module, IO-Link communications module and IO-Link I/O modules
- Range of ambient temperature from -30 °C/-25 °C to +55 °C
- Extensive system functions
  - All interface and I/O modules support firmware update
  - Configuration control (option handling) via user software
  - System support of PROFIenergy for energy savings purposes
  - Consistent use of identification and maintenance data IM0 to IM3/4 (electronic rating plate) for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.).

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Overview



- Multi-protocol capability:

Operation of the ET 200AL interface module on Ethernet controllers via the PROFINET, EtherNet/IP and Modbus TCP protocols

- Max. 32 I/O modules can be connected
- Max. data volume of 1440 bytes, for input and output data respectively (depends on protocol)
- Shortest bus cycle time 250 µs (depends on protocol)
- Automatic startup by means of topology discovery (depends on protocol)
- Shared device:

Simultaneous access from different controllers via different Ethernet protocols PROFINET, EtherNet/IP and Modbus TCP

- Local data links:

Deterministic, easy-to-configure data exchange between controllers, also via different Ethernet protocols PROFINET, EtherNet/IP and Modbus TCP

- S2 system redundancy
- Support for the MRP (media redundancy protocol) and MRPD (media redundancy with planned duplication) functions
- Identification and maintenance data IM0 ... IM4
- Autocrossover
- Firmware update
- Configuration management (option handling)
- PROFIenergy
- Security functions

Selection and ordering data

IM 157-1 MF interface module	**6ES7157-1MA00-0AB0**
For connecting ET 200AL to PROFINET	
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 plugs	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 plugs, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 plug	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
M8 power cable	
4-pin	
Pre-assembled at both ends, M8 plug and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 plug and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 plug for ET connection	**6ES7194-2AB00-0AA0**
4-pin, shielded	

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Selection and ordering data (continued)

M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool Stripping tool for stripping the ET connection bus cable	**6ES7194-2KA00-0AA0**
Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

Technical specifications

Article number	6ES7157-1MA00-0AB0 ET 200AL, IM 157-1 MF
General information	
Product type designation	IM 157-1 MF
Product function	
• I&M data	Yes; I&M0 to I&M4
• Isochronous mode	No
• IRT	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 or higher
• STEP 7 configurable/integrated from version	from V5.6
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.5
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	80 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Address area	
Address space per station	
• Address space per station, max.	1 440 byte
Hardware configuration	
Submodules	
• Number of submodules per station, max.	125
Interfaces	
Number of PROFINET interfaces	1; 2 ports (switch)
1. Interface	
Interface type	PROFINET
Interface types	
• M12 port	Yes; 2x M12 D-coded
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes
- Prioritized startup	Yes
- Shared device	Yes

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Technical specifications (continued)

Article number	6ES7157-1MA00-0AB0 ET 200AL, IM 157-1 MF
Interface types	
M12 port	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
PROFIBUS	No
EtherNet/IP	Yes
Modbus TCP	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	14; 4x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	Yes
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Configuration control via Explicit Messaging	No
- Shared device	Yes; 4x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Redundancy mode	
- DLR (Device Level Ring)	No
- Address area	
- Address space per module, max.	264 byte
- ForwardOpen (Class1 & 32 bit Header)	500 byte
- LargeForwardOpen (Class3)	4 002 byte
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- Read Input Register (Code=4)	Yes
- write single coil (code=5)	Yes
- Write Single Register (Code=6)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Read/Write Multiple Registers (Code=23)	Yes
- Parameter change by master	Yes

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Technical specifications (continued)

Article number	6ES7157-1MA00-0AB0 ET 200AL, IM 157-1 MF
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	500 byte; (246 byte outputs / 500 byte inputs)
- Access-consistent address space	250 byte; (246 byte outputs / 250 byte inputs)
- Updating time	
- I/O request interval	2 ms
- Connections	
- number of connections per device	9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Connection display LINK TX/RX	Yes; 2x green LED
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
data integrity	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm

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Technical specifications (continued)

Article number	6ES7157-1MA00-0AB0 ET 200AL, IM 157-1 MF
Weights	
Weight, approx.	215 g

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Overview



- Interface module for connecting ET 200AL to PROFINET
- Handles data exchange with the PROFINET I/O controller in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 1430 bytes, for input and output data respectively
- Shortest bus cycle time 250 µs
- Automatic startup by means of topology discovery
- Autocrossover
- Shared device on up to 4 I/O controllers
- Support for the MRP (media redundancy protocol) and MRPD (media redundancy with planned duplication) functions
- Identification and maintenance data IM0 ... IM4
- Firmware update
- Configuration management (option handling)
- PROFIenergy

Selection and ordering data

IM 157-1 PN interface module	**6ES7157-1AB00-0AB0**
For connecting ET 200AL to PROFINET	
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection	**6ES7194-2AB00-0AA0**
4-pin, shielded	

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Selection and ordering data (continued)

M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool Stripping tool for stripping the ET connection bus cable	**6ES7194-2KA00-0AA0**
Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

Technical specifications

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
General information	
Product type designation	IM 157-1 PN
Product function	
• I&M data	Yes; I&M0 to I&M4
• Isochronous mode	No
• IRT	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3
• PROFINET from GSD version/GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	100 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Address area	
Address space per station	
• Address space per station, max.	1 430 byte
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET
Interface types	
• M12 port	Yes; 2x M12 D-coded
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes
- Prioritized startup	Yes
- Shared device	Yes
Interface types	
M12 port	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	Yes; for Ethernet services
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)

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Technical specifications (continued)

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
PROFIBUS	No
EtherNet/IP	No
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
Redundancy mode	
• PROFINET system redundancy (S2)	No
• PROFINET system redundancy (R1)	No
- Media redundancy	
- MRP	Yes
- MRPD	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Connection display LINK TX/RX	Yes; 2x green LED
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Security	
PROFINET Security Class	0
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm

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Technical specifications (continued)

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	263 g

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Overview



- Interface module for connecting ET 200AL to PROFIBUS
- As DPV1 slave it handles the data exchange with the PROFIBUS master in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 244 bytes, for input and output data respectively
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 99; can be set by means of rotary switch
- Identification and maintenance data IM0 ... IM3
- Firmware update
- Configuration management (option handling)

Selection and ordering data

IM 157-1 DP interface module	**6ES7157-1AA00-0AB0**
For connecting ET 200AL to PROFIBUS	
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
M8 power cable	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection	**6ES7194-2AB00-0AA0**
4-pin, shielded	

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Selection and ordering data (continued)

M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect Stripping Tool Stripping tool for stripping the ET connection bus cable	**6ES7194-2KA00-0AA0**
Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

Technical specifications

Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
General information	
Product type designation	IM 157-1 DP
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	50 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Address area	
Address space per station	
• Address space per station, max.	244 byte
Interfaces	
Number of PROFIBUS interfaces	1
1. Interface	
Interface type	PROFIBUS DP
Interface types	
• RS 485	Yes
• M12 port	Yes; 2x M12 B-coded
Protocols	
• PROFIBUS DP device	Yes
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
Protocols	
PROFINET IO	No
PROFIsafe	No
PROFIBUS	Yes
EtherNet/IP	No
PROFIBUS DP	
- Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV0	Yes

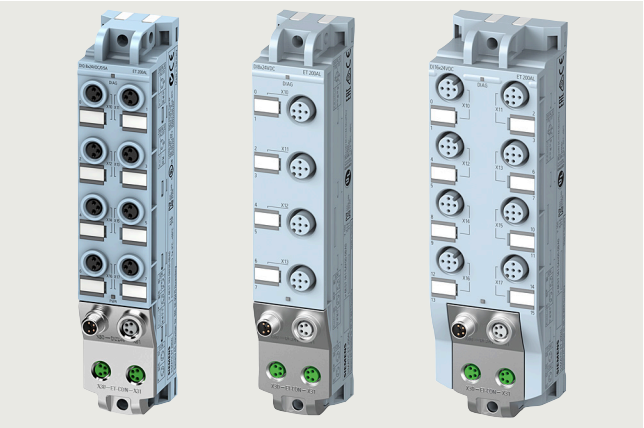
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Technical specifications (continued)

Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
- DPV1	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Connection display DP	Yes; green LED
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	46 mm
Weights	
Weight, approx.	211 g

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Overview



- 30 and 45 mm wide modules with parameters and diagnostic functions
- 8-channel digital input module with M8 or M12 connection
- 16-channel digital input module with M12 connection
- 8-channel digital input/output module with M8 or M12 connection
- 16-channel digital input / output module with M12 connection
- 8-channel digital output module 2A with M12 connection

Selection and ordering data

Digital input modules	
DI 8X24VDC, 8XM8	**6ES7141-5BF00-0BA0**
DI 8X24VDC, 4XM12	**6ES7141-5AF00-0BA0**
DI 16X24VDC, 8XM12	**6ES7141-5AH00-0BA0**
Digital output modules	
DQ 8X24VDC/2A, 8XM12	**6ES7142-5AF00-0BA0**
Digital input/output modules	
4 DIQ / 4 DQ, 24 V DC, 0.5 A	**6ES7143-5BF00-0BA0**
DIQ 4+DQ 4X24VDC/0.5A, 4xM12	**6ES7143-5AF00-0BA0**
DIQ 8x24 V DC/0.5 A, 8xM8	**6ES7143-5BF50-0BA0**
DIQ 16x24 V DC/0.5 A, 8xM12	**6ES7143-5AH00-0BA0**
Accessories	
Bus cable for backplane bus (ET connection)	
4-pole, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
Power cable M8	
4-pole	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**

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Selection and ordering data (continued)

10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection	**6ES7194-2AB00-0AA0**
4-pole, shielded	
M8 power connector	
Pin insert, 4-pole	**6ES7194-2AA00-0AA0**
Socket insert, 4-pole	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool	**6ES7194-2KA00-0AA0**
Stripping tool for stripping the ET connection bus cable	
Labels	**6ES7194-2BA00-0AA0**
10 x 5 mm, RAL 9016; 5 frames with 40 plates each	

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Technical specifications

Article number	6ES7141-5BF00-0BA0 ET 200AL, DI 8x24VDC, 8xM8	6ES7141-5AF00-0BA0 ET 200AL, DI 8x24VDC, 4xM12	6ES7141-5AH00-0BA0 ET 200AL, DI 16x24VDC, 8xM12
General information			
Product type designation	DI 8x24VDC	DI 8x24VDC	DI 16x24VDC
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with			
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
Supply voltage			
Load voltage 1L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current			
Current consumption (rated value)	25 mA; without load	25 mA; without load	30 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
Encoder supply			
Number of outputs	8	4	8
Digital inputs			
Number of digital inputs	8	8	16
Sourcing/sinking input	P-reading	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
- all mounting positions			
- up to 55 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	3.2 mA	3.2 mA	3.2 mA
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/status information			
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnoses			
• short-circuit	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module
Diagnostics indication LED			
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED	Yes; green/red LED
Potential separation			
between the load voltages	Yes	Yes	Yes
Potential separation channels			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7141-5BF00-0BA0 ET 200AL, DI 8x24VDC, 8xM8	6ES7141-5AF00-0BA0 ET 200AL, DI 8x24VDC, 4xM12	6ES7141-5AH00-0BA0 ET 200AL, DI 16x24VDC, 8xM12
• between the channels and the power supply of the electronics	No	No	No
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes; from FS01	Yes; from FS01	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2
Security			
signed firmware update	Yes	Yes	Yes
data integrity	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• min.	-30 °C	-30 °C	-30 °C
• max.	55 °C	55 °C	55 °C
Altitude during operation relating to sea level			
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole
ET-Connection			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
Weights			
Weight, approx.	145 g	145 g	184 g

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	6ES7143-5BF50-0BA0 ET 200AL, DIQ 8x24VDC/0,5A, 8xM8	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
General information				
Product type designation	DIQ 4+DQ 4x24VDC/0.5A	DIQ 4+DQ 4x24VDC/0.5A	DIQ 8x24VDC/0.5A, 8xM8	DIQ 16x24VDC/0.5A
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M4	Yes; I&M0 to I&M3
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V18 or higher	STEP 7 V14 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.6 and higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.4.x	GSDML V2.3.1
Operating mode				
• DI				Yes
• Counter				Yes
• DQ				Yes
Supply voltage				
Load voltage 1L+				
• Rated value (DC)	24 V	24 V	24 V	24 V

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Technical specifications (continued)

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	6ES7143-5BF50-0BA0 ET 200AL, DIQ 8x24VDC/0,5A, 8xM8	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; against destruction	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Load voltage 2L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Input current				
Current consumption (rated value)	40 mA; 40 mA (1L+) / 20 mA (2L+); without load	40 mA; 40 mA (1L+) / 20 mA (2L+); without load	20 mA; 20 mA (1L+) / 40 mA (2L+); without load	60 mA; 60 mA (1L+) / 40 mA (2L+); without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
Encoder supply				
Number of outputs	4	4	8	8
Digital inputs				
Number of digital inputs	4; Parameterizable as DIQ	4; Parameterizable as DIQ	8; Parameterizable as DIQ	16; Parameterizable as DIQ
Sourcing/sinking input	P-reading	P-reading	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs				
- all mounting positions				
- up to 55 °C, max.	4	4	8	16
Digital input functions, parameterizable				
• Freely usable digital input				Yes
• Counter				Yes
Input voltage				
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V	+11 to +30V
Input current				
• for signal "1", typ.	3.2 mA	3.2 mA	2.4 mA	3 mA
Input delay (for rated value of input voltage)				
- for standard inputs				
- parameterizable				Yes
- for technological functions				
- parameterizable				Yes
Digital outputs				
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable	8; 4 DQ fixed, 4 DIQ parameterizable	8	16; Parameterizable as DIQ
• in groups of	4; 2 load groups for 4 outputs each	4; 2 load groups for 4 outputs each		8; 2 load groups for 8 outputs each
Current-sourcing	Yes	Yes	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes	Yes	Yes	Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	2L+ (-47 V)	L+ (-53 V)
Digital output functions, parameterizable				
• Switching tripped by comparison values				Yes
• Freely usable digital output				Yes
Switching capacity of the outputs				
• on lamp load, max.	5 W	5 W	5 W	5 W

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Technical specifications (continued)

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	6ES7143-5BF50-0BA0 ET 200AL, DIQ 8x24VDC/0,5A, 8xM8	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
Load resistance range				
• lower limit	48 Ω	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ	4 kΩ
Output voltage				
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
Output current				
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Switching frequency				
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz	1 Hz
Total current of the outputs				
• Current per group, max.	2 A	2 A		4 A
• Current per module, max.			4 A	
Encoder				
Connectable encoders				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/status information				
Substitute values connectable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnoses				
• short-circuit	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module
Diagnostics indication LED				
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED	Yes; green/red LED	Yes; green/red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
Potential separation				
between the load voltages	Yes	Yes	Yes	Yes
Potential separation channels				
• between the channels, in groups of	4; DIQ channels are isolated from DQ channels	4; DIQ channels are isolated from DQ channels		8
• between the channels and backplane bus	Yes	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	Yes	No; 8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Standards, approvals, certificates				
Suitable for safety-related tripping of standard modules	Yes; from FS01	Yes; from FS01	Yes; from FS01	No
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL d	PL d	PL d	
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2	

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Technical specifications (continued)

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	6ES7143-5BF50-0BA0 ET 200AL, DIQ 8x24VDC/0,5A, 8xM8	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
Security				
signed firmware update	Yes	Yes	Yes	Yes
data integrity	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• min.	-30 °C	-30 °C	-30 °C	-30 °C
• max.	55 °C	55 °C	55 °C	55 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method				
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M8, 3-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole	M8, 4-pole
ET-Connection				
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions				
Width	30 mm	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm	40 mm
Weights				
Weight, approx.	145 g	145 g	145 g	195 g

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Overview



- 30 mm wide module with parameters and diagnostic functions
- For connecting analog actuators and sensors without additional amplifiers
- 4-channel analog input modules with M12 connection
- 4-channel analog output module with M12 connection

Selection and ordering data

Analog input modules	
AI 4xU/I/RTD, 4XM12	**6ES7144-5KD00-0BA0**
AI 4xRTD/TC, 4xM12	**6ES7144-5KD50-0BA0**
AQ 4xU/I, 4xM12	**6ES7145-5ND00-0BA0**
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**

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Selection and ordering data (continued)

M8 connector for ET connection 4-pin, shielded	**6ES7194-2AB00-0AA0**
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool Stripping tool for stripping the ET connection bus cable	**6ES7194-2KA00-0AA0**
Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

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Technical specifications

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12	6ES7144-5KD50-0BA0 ET 200AL, AI 4xRTD/TC, 4xM12
General information		
Product type designation	AI 4xU/I/RTD	AI 4xRTD/TC
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V16 or higher
• STEP 7 configurable/integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 and higher
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.3.1	GSDML V2.34
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
Current consumption (rated value)	35 mA; without load	30 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value
Encoder supply		
Number of outputs	4	
Analog inputs		
Number of analog inputs	4	4
Constant measurement current for resistance-type transmitter, typ.		230 ... 300 µA
Cycle time (all channels), min.	8 ms	90 ms
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	
• 1 V to 5 V	Yes	
• -80 mV to +80 mV		Yes; 16 bit incl. sign
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
Input ranges (rated values), thermocouples		
• type B		Yes; 16 bit incl. sign
• type C		Yes; 16 bit incl. sign
• Type E		Yes; 16 bit incl. sign
• Type J		Yes; 16 bit incl. sign
• Type K		Yes; 16 bit incl. sign
• Type L		Yes; 16 bit incl. sign
• Type N		Yes; 16 bit incl. sign
• Type R		Yes; 16 bit incl. sign
• Type S		Yes; 16 bit incl. sign
• Type T		Yes; 16 bit incl. sign
• Type U		Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer		
• Ni 100	Yes; Standard/climate	Yes; Standard/climate
• Ni 1000		Yes; Standard/climate
• Pt 100	Yes; Standard/climate	Yes; Standard/climate
• Pt 1000		Yes; Standard/climate
Input ranges (rated values), resistors		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
Thermocouple (TC)		
- Temperature compensation		
- Parameterizable		Yes

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Technical specifications (continued)

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12	6ES7144-5KD50-0BA0 ET 200AL, AI 4xRTD/TC, 4xM12
Cable length		
• shielded, max.	30 m	30 m
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes; channel by channel	Yes; channel by channel
• Integration time (ms)	0,3 / 16,7 / 20 / 60	16.7 / 20 / 60
• Basic conversion time, including integration time (ms)		18 / 21 / 61 ms
• Interference voltage suppression for interference frequency f1 in Hz	3 600 / 60 / 50 / 16.7	60 / 50 / 16.7
• Conversion time (per channel)	2 / 18 / 21 / 61 ms	
Smoothing of measured values		
• Parameterizable	Yes	Yes
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	
• for current measurement as 2-wire transducer	Yes	
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with two-wire connection	Yes	Yes
• for resistance measurement with three-wire connection	Yes	Yes
• for resistance measurement with four-wire connection		Yes
Errors/accuracies		
Temperature error of internal compensation		±4 °C
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.25 %	0.25 %
• Current, relative to input range, (+/-)	0.25 %	
• Resistance, relative to input range, (+/-)	0.15 %	0.15 %
• Resistance thermometer, relative to input range, (+/-)	0.15 %	0.15 %
• Thermocouple, relative to input range, (+/-)		0.25 %
Interference voltage suppression for f = n x (f1 +/- 0.5 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• Wire break	Yes; at 4 mA to 20 mA and 1 V to 5 V	Yes; Not for ±80 mV
• short-circuit	Yes; Encoder supply to M, channel by channel	
• Overflow/Underflow	Yes	Yes
Diagnostics indication LED		
• Channel status display	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
Potential separation		
between the load voltages	Yes	Yes
Potential separation channels		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; from FS01

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Technical specifications (continued)

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12	6ES7144-5KD50-0BA0 ET 200AL, AI 4xRTD/TC, 4xM12
Suitable for applications according to AMS 2750		Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9		Yes; Based on AMS 2750 E
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Security		
signed firmware update	Yes	Yes
data integrity	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-30 °C	-30 °C
• max.	55 °C	55 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method		
Design of electrical connection for the inputs and outputs	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole
ET-Connection		
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions		
Width	30 mm	30 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
Weights		
Weight, approx.	168 g	168 g

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
General information	
Product type designation	AQ 4xU/I
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V14 or higher
• STEP 7 configurable/integrated from version	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; actuator power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value)	75 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Actuator supply	
Number of outputs	4
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	24 mA
Current output, no-load voltage, max.	15 V

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Technical specifications (continued)

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
Cycle time (all channels) max.	1 ms
Output ranges, voltage	
• 0 to 10 V	Yes; 15 bit
• 1 V to 5 V	Yes; 14 bit
• -10 V to +10 V	Yes; 16 bit incl. sign
Output ranges, current	
• 0 to 20 mA	Yes; 15 bit
• -20 mA to +20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 14 bit
Connection of actuators	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
• for current output four-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	500 Ω
• with current outputs, inductive load, max.	1 mH
Cable length	
• shielded, max.	30 m
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
Settling time	
• for resistive load	1 ms
• for capacitive load	1 ms
• for inductive load	1 ms
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output range, (+/-)	0.15 %
• Current, relative to output range, (+/-)	0.15 %
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Wire break	Yes; channel-by-channel, only for output type "current"
• short-circuit	Yes; Actuator supply module by module; channel by channel for output type "voltage"
Diagnostics indication LED	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS03
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d

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Technical specifications (continued)

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Security	
signed firmware update	Yes
data integrity	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	175 g

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Overview



The ET 200AL fail-safe I/O module expands the ET 200AL PN system family. It is incorporated seamlessly into the Safety Integrated concept of SIMATIC. It also supports safety-related communication via PROFIsafe. The functional safety is certified in accordance with IEC 61508. It is designed for safety-related use up to SIL 3 according to IEC 62061 and PL e according to ISO 13849.
The following fail-safe I/O module with 4x digital inputs and 2x digital outputs with 45 mm width is available:

- F-DI 4+F-DQ 2x24VDC/2A, 4xM12 PROFIsafe

Selection and ordering data

Fail-safe digital input/output modules	
F-DI 4+F-DQ 2x24VDC/2A, 4xM12	**6ES7146-5FF00-0BA0**
Accessories	
M12 Y-cable	
For connection of single-channel sensors (1oo1 evaluation), 5-pin	**6ES7194-6KB00-0XA0**
For joint connection of an F-DQ and an F-DI channel by means of an 8-pin M12 socket	**6ES7194-6KC00-0XA0**
E-coding plug (metal) for fail-safe ET 200 distributed I/O, IP65/67	**6ES7194-6KB01-0AA0**
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 plugs	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 plugs, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 plug	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
M8 power cable	
4-pin	
Pre-assembled at both ends, M8 plug and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 plug and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**

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Selection and ordering data (continued)

5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 plug for ET connection 4-pin, shielded	**6ES7194-2AB00-0AA0**
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool Stripping tool for stripping the ET connection bus cable	**6ES7194-2KA00-0AA0**
Labels, yellow 10 x 5 mm; 5 frames with 40 labels each	**6ES7194-2BB00-0AA0**

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Technical specifications

Article number	6ES7146-5FF00-0BA0 ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
General information	
Product type designation	F-DI 4+F-DQ 2x24VDC/2A, 4xM12
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher
Operating mode	
• DI	Yes
• DQ	Yes
Supply voltage	
Rated value (DC)	24 V
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; outputs applied with reversed polarity for loads connected between M-switch and 2L+ will conduct
Input current	
Current consumption (rated value)	55 mA (1L+) / 40 mA (2L+); without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	2
Digital inputs	
Number of digital inputs	4
Input characteristic according to IEC 61131	Type 1
Number of simultaneously controllable inputs	
- all mounting positions	
- up to 55 °C, max.	4
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	4.85 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- Parameterizable	Yes
Digital outputs	
Number of digital outputs	2
• in groups of	2
Short-circuit protection	Yes; per channel, electronic
Open-circuit detection	Yes; per channel, only detects when output is off
Overload protection	Yes
Limitation of inductive shutdown voltage to	P-switch: -26 V DC referenced to 2M, M-switch: +48 V DC referenced to 2M
Switching capacity of the outputs	
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	2 kΩ
Output voltage	
• for signal "1", min.	L+ (-2.0 V), P-switch is L+ (-1.5 V), M-switch is 0.5 V
Output current	
• for signal "1" rated value	2 A

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Technical specifications (continued)

Article number	6ES7146-5FF00-0BA0 ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per group, max.	4 A
Encoder	
Connectable encoders	
• 2-wire sensor	No
- permissible quiescent current (2-wire sensor), max.	0.5 mA
Interrupts/diagnostics/status information	
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire break	Yes; outputs when off
• short-circuit	Yes; inputs, outputs, encoder supply
Diagnostics indication LED	
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels, in groups of	4 DI channels are isolated from 2 DQ channels
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	DI channels are non-isolated from supply voltage 1L+ and DQ channels are isolated from the supply voltage 1L+
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLd (DI single-channel), PLe (DI two-channel, DQ)
• SIL acc. to IEC 61508	SIL 2 (DI single-channel), SIL 3 (DI two-channel, DQ)
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pin
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	220 g

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Overview





- 30 mm or 45 mm wide CM IO-Link communications modules
- For connecting up to 4 or 8 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B, or port Class A and port Class B
- The IO-Link parameters are configured using the S7-PCT Port Configuration Tool, V3.5 SP4 Update 1 and higher.

Selection and ordering data

CM IO-Link	
CM 4X IO-Link, 4XM12; for the connection of up to 4 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B	**6ES7147-5JD01-0BA0**
CM 8x IO-Link, 8x M12; for the connection of up to 8 IO-Link devices according to IO-Link Specification V1.0 and V1.1, 6x port Class A and 2x port Class B	**6ES7147-5JJ00-0BA0**
Accessories	
Bus cable for backplane bus (ET connection)	
4-pole, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
Power cable M8	
4-pole	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**

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Selection and ordering data (continued)

10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection 4-pole, shielded	**6ES7194-2AB00-0AA0**
M8 power connector	
Pin insert, 4-pole	**6ES7194-2AA00-0AA0**
Socket insert, 4-pole	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool Stripping tool for stripping the ET connection bus cable	**6ES7194-2KA00-0AA0**
Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

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Technical specifications

Article number	6ES7147-5JD01-0BA0 ET 200AL, cm 4x IO-Link, 4xM12	6ES7147-5JJ00-0BA0 ET 200AL, CM 8x IO-Link, 8xM12
General information		
Product type designation	CM 4x IO-Link	CM 8x IO-Link
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher	STEP 7 V20 or higher with HSP0462
• STEP 7 configurable/integrated from version	STEP 7 V5.7 or higher SP1 or higher	STEP 7 V5.7 or higher SP1 or higher
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5	
• PROFINET from GSD version/GSD revision	GSDML V2.4.x	GSDML V2.4.x
Operating mode		
• IO-Link	Yes	Yes
• DI	Yes	Yes
• DQ	Yes; max. 100 mA	Yes; max. 100 mA
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; actuator power supply outputs applied with reversed polarity	Yes; Against destruction; actuator power supply outputs applied with reversed polarity
Input current		
Current consumption (rated value)	30 mA; without load	45 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value
Encoder supply		
Number of outputs	4	8
Digital inputs		
Number of digital inputs		6; Parameterizable as DIQ
Digital inputs, parameterizable		Yes
Sourcing/sinking input		P-reading
Input characteristic curve in accordance with IEC 61131, type 3		Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 55 °C, max.		8
Input voltage		
• Rated value (DC)		24 V
• for signal "0"		-3 to +5V
• for signal "1"		+11 to +30V
Input current		
• for signal "1", typ.		2.5 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable		No
Digital outputs		
Number of digital outputs		6; Parameterizable as DIQ
Short-circuit protection		Yes; per channel, electronic
Limitation of inductive shutdown voltage to		1L+ (-53 V)
Controlling a digital input		Yes
Switching capacity of the outputs		
• on lamp load, max.		5 W
Load resistance range		
• lower limit		48 Ω
• upper limit		4 Ω
Output voltage		
• for signal "1", min.		1L+ (-0.8V)
Output current		

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Technical specifications (continued)

Article number	6ES7147-5JD01-0BA0 ET 200AL, cm 4x IO-Link, 4xM12	6ES7147-5JJ00-0BA0 ET 200AL, CM 8x IO-Link, 8xM12
• for signal "1" rated value		0.5 A
• for signal "0" residual current, max.		0.5 mA
Switching frequency		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		1 Hz
Total current of the outputs		
• Current per module, max.		4 A
Encoder		
Connectable encoders		
• 2-wire sensor		Yes
- permissible quiescent current (2-wire sensor), max.		1.5 mA
IO-Link		
Number of ports	4	8
• of which simultaneously controllable	4	8
IO-Link protocol 1.0	Yes	Yes
IO-Link protocol 1.1	Yes	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms	2 ms
Size of process data, input per port	33 byte	33 byte
Size of process data, input per module	132 byte	237 byte
Size of process data, output per port	32 byte	32 byte
Size of process data, output per module	128 byte	237 byte
Memory size for device parameter	2 kbyte; for each port	2 kbyte
Master backup	possible with LIOLink_Master function block	possible with LIOLink_Master function block
Configuration without S7-PCT	Possible; autostart/manual function	Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m
Connection of IO-Link devices		
• Port type A	Yes; via 3-core cable	via 3-core cable
• Port type B	Yes; additional device supply: max. 1.6 A per port, max. 4 A per module	Additional device supply: max. 2 A per port, max. 4 A per module
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
• short-circuit	Yes	Yes
Diagnostics indication LED		
• Channel status display	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED
Potential separation		
between the load voltages	Yes	Yes
Potential separation channels		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes	Yes
Security		
signed firmware update	Yes	Yes
data integrity	Yes	Yes

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Technical specifications (continued)

Article number	6ES7147-5JD01-0BA0 ET 200AL, cm 4x IO-Link, 4xM12	6ES7147-5JJ00-0BA0 ET 200AL, CM 8x IO-Link, 8xM12
Ambient conditions		
Ambient temperature during operation		
• min.	-30 °C	-30 °C
• max.	55 °C	55 °C
Connection method		
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole
ET-Connection		
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions		
Width	30 mm	45 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
Weights		
Weight, approx.	145 g	184 g

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Overview



The IO-Link communication standard enables and standardizes communication between machine and plant PLCs, on the one hand, and sensors, actuators and other field devices, on the other hand.

The IO-Link I/O modules enable the simple connection of binary standard sensors and actuators, whereby the signals and energy supply are transferred via IO-Link (IO-Link master).

The IO-Link I/O modules can be connected to any IO-Link masters and, in this way, fieldbus-independent and distributed I/O units can be formed. The universal usage of the IO-Link DIQ I/O modules enables additional flexibility here.

With the ET 200AL IO-Link I/O modules, a comprehensive portfolio of digital input, output and input/output modules with the design and system features of the ET 200AL is available.

Selection and ordering data

IO-Link digital input modules	
Degree of protection IP67	
• DI 8x 24VDC, 8x M8	**6ES7141-5BF00-0BL0**
• DI 16x 24VDC, 8x M12	**6ES7141-5AH00-0BL0**
IO-Link digital output modules	
Degree of protection IP67	
• DQ 8x 24VDC/2A, 8x M12	**6ES7142-5AF00-0BL0**
IO-Link digital input/output modules	
Degree of protection IP67	
• DIQ 4+DQ 4x 24VDC/0.5A, 8x M8	**6ES7143-5BF00-0BL0**
• DIQ 16x24VDC/0.5A, 8x M12	**6ES7143-5AH00-0BL0**
Accessories	
Control connecting cable 5 x 0.25 Flexible IO-Link cable with 5 copper cores (0.25 mm²) for connecting IO-Link sensors/actuators (IO-Link port class B); sold by the meter; max. delivery unit 1 000 m minimum order quantity 20 m	**6XV1801-2C**
M12 circular connector Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm2, A-coded, max. 4 A	
• Straight	**3RK1902-4BA00-5AA0**
• Angled	**3RK1902-4DA00-5AA0**
Control line Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm2, A-coded, max. 4 A, PUR casing, black	
• 1.5 m	**3RK1902-4HB15-5AA0**
• 5 m	**3RK1902-4HB50-5AA0**
• 10 m	**3RK1902-4HC01-5AA0**
M12-180/M12-180 control connecting cable Flexible 5-core cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket, both ends with a straight cable outlet, for connection of IO-Link sensors/actuators	
• 0.5 m	**6XV1801-2CE50**
• 1.0 m	**6XV1801-2CH10**
• 1.5 m	**6XV1801-2CH15**
• 2.0 m	**6XV1801-2CH20**
• 3.0 m	**6XV1801-2CH30**
• 5.0 m	**6XV1801-2CH50**
• 10 m	**6XV1801-2CN10**
• 15 m	**6XV1801-2CN15**
Power M12 cable connector PRO Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit	**6GK1906-0EB00**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**
M12 sealing cap for IP67 modules 15 mm outer diameter, with O-ring, 10 units	**3RK1901-1KA00**
M8 sealing cap For IP67 modules	**3RK1901-1PN00**
M12 Y-cable For double connection of I/O by means of a single cable to ET 200, 5-pin	**6ES7194-6KA00-0XA0**

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Selection and ordering data (continued)

Energy cable 4 x 1.5 Trailable power cable, with 4 copper cores (1.5 mm2) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1801-2B**
M12-180/M12-180 **M12 power connecting cable** Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length:	
• 0.5 m	**6XV1801-6DE50**
• 1.0 m	**6XV1801-6DH10**
• 1.5 m	**6XV1801-6DH15**
• 2.0 m	**6XV1801-6DH20**
• 3.0 m	**6XV1801-6DH30**
• 5.0 m	**6XV1801-6DH50**
• 10 m	**6XV1801-6DN10**
• 15 m	**6XV1801-6DN15**
M12-90/M12-90 **M12 power connecting cable** Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length:	
• 0.5 m	**6XV1801-6GE50**
• 1.0 m	**6XV1801-6GH10**
• 1.5 m	**6XV1801-6GH15**
• 2.0 m	**6XV1801-6GH20**
• 3.0 m	**6XV1801-6GH30**
• 5.0 m	**6XV1801-6GH50**
• 10 m	**6XV1801-6GN10**
• 15 m	**6XV1801-6GN15**
Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

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Technical specifications

Article number	6ES7141-5BF00-0BL0 ET 200AL, IO-Link, DI 8x24VDC, 8xM8	6ES7141-5AH00-0BL0 ET 200AL, IO-Link, DI 16x24VDC, 8xM12
General information		
Product type designation	IO-Link DI 8x24VDC	IO-Link DI 16x24VDC
Engineering with		
• IODD file	Yes	Yes
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V; Supply from 1Us+ of the IO-Link master	24 V; Supply from 1Us+ of the IO-Link master
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current		
Current consumption (rated value)	15 mA; without load	20 mA; without load
Encoder supply		
Number of outputs	8; Supply from 1Us+ of the IO-Link master	8; Supply from 1Us+ of the IO-Link master
Digital inputs		
Number of digital inputs	8	16
Sourcing/sinking input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 55 °C, max.	8	16
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	3 mA	3 mA
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
IO-Link		
IO-Link protocol 1.1	Yes	Yes
Transmission rate	38.4 kBd (COM2)	38.4 kBd (COM2)
Cycle time, min.	2.1 ms	2.5 ms
Size of process data, input per module	1 byte	2 byte
Size of process data, output per module	0 byte	0 byte
Supported IO-Link profiles	common profile	common profile
Cable length unshielded, max.	20 m	20 m
Connection of IO-Link devices		
• Port type A	Yes	Yes
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• short-circuit	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module
Diagnostics indication LED		
• Channel status display	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
Potential separation		
Potential separation channels		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67

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Technical specifications (continued)

Article number	6ES7141-5BF00-0BL0 ET 200AL, IO-Link, DI 8x24VDC, 8xM8	6ES7141-5AH00-0BL0 ET 200AL, IO-Link, DI 16x24VDC, 8xM12
Ambient conditions		
Ambient temperature during operation		
• min.	-30 °C	-30 °C
• max.	55 °C	55 °C
Connection method		
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pin, A-coded
Type of electrical connection for IO-Link	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Dimensions		
Width	30 mm	45 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
Weights		
Weight, approx.	124 g	155 g

Article number	6ES7143-5BF00-0BL0 ET 200AL, IO-Link, DIQ 4+DQ 4x24VDC/0,5A	6ES7143-5AH00-0BL0 ET 200AL, IO-Link, DIQ 16x24VDC/0,5A
General information		
Product type designation	IO-Link DIQ 4+DQ 4x24VDC/0.5A	IO-Link DIQ 16x24VDC/0.5A
Engineering with		
• IODD file	Yes	Yes
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V; Supply from 1Us+ of the IO-Link master	24 V; Supply from 1Us+ of the IO-Link master
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Load voltage 2L+		
• Rated value (DC)	24 V; Supply from 2UA+ of the IO-Link master	24 V; Supply from 2UA+ of the IO-Link master
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Input current		
Current consumption (rated value)	15 mA; without load	20 mA; without load
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value
Encoder supply		
Number of outputs	8; Supply from 2UA+ of the IO-Link master	8; Supply from 2UA+ of the IO-Link master
Digital inputs		
Number of digital inputs	4; Parameterizable as DIQ	16; Parameterizable as DIQ
Sourcing/sinking input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 55 °C, max.	4	16
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	3 mA	3 mA
Digital outputs		
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable	16; Parameterizable as DIQ
Current-sourcing	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes	
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-50 V)	2L+ (-50 V)
Switching capacity of the outputs		

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Technical specifications (continued)

Article number	6ES7143-5BF00-0BL0 ET 200AL, IO-Link, DIQ 4+DQ 4x24VDC/0,5A	6ES7143-5AH00-0BL0 ET 200AL, IO-Link, DIQ 16x24VDC/0,5A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ
Output voltage		
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
Total current of the outputs		
• Current per module, max.	4 A	4 A
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
IO-Link		
IO-Link protocol 1.1	Yes	Yes
Transmission rate	38.4 kBd (COM2)	38.4 kBd (COM2)
Cycle time, min.	2.4 ms	3 ms
Size of process data, input per module	1 byte	2 byte
Size of process data, output per module	1 byte	2 byte
Supported IO-Link profiles	common profile	common profile
Cable length unshielded, max.	20 m	20 m
Connection of IO-Link devices		
• Port type B	Yes	Yes
Interrupts/diagnostics/status information		
Substitute values connectable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• short-circuit	Yes; outputs to ground; encoder supply to ground; module by module	Yes; outputs to ground; encoder supply to ground; module by module
Diagnostics indication LED		
• Channel status display	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED
Potential separation		
between the load voltages	Yes	Yes
Potential separation channels		
• between the channels	No	No
• between the channels and the power supply of the electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; from FS01	
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	

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Technical specifications (continued)

Article number	6ES7143-5BF00-0BL0 ET 200AL, IO-Link, DIQ 4+DQ 4x24VDC/0,5A	6ES7143-5AH00-0BL0 ET 200AL, IO-Link, DIQ 16x24VDC/0,5A
Ambient conditions		
Ambient temperature during operation		
• min.	-30 °C	-30 °C
• max.	55 °C	55 °C
Connection method		
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pin, A-coded
Type of electrical connection for IO-Link	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Dimensions		
Width	30 mm	45 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
Weights		
Weight, approx.	125 g	157 g

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Overview

- Pre-assembled cables in various designs and lengths:
  - For connecting the interface modules and I/O modules via the internal backplane bus (ET connection).
  - For power supply.

Selection and ordering data

Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
PUR line, pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2MH02-0AA0**
0.3 m	**6ES7194-2MH03-0AA0**
1 m	**6ES7194-2MH10-0AA0**
2 m	**6ES7194-2MH20-0AA0**
5 m	**6ES7194-2MH50-0AA0**
10 m	**6ES7194-2MN10-0AA0**
15 m	**6ES7194-2MN15-0AA0**
PUR line, pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2MH03-0AB0**
1 m	**6ES7194-2MH10-0AB0**
2 m	**6ES7194-2MH20-0AB0**
5 m	**6ES7194-2MH50-0AB0**
10 m	**6ES7194-2MN10-0AB0**
15 m	**6ES7194-2MN15-0AB0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
PUR line, pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2MH20-0AC0**
5 m	**6ES7194-2MH50-0AC0**
10 m	**6ES7194-2MN10-0AC0**
15 m	**6ES7194-2MN15-0AC0**
Connecting cable for bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors. 0.2 m	**6ES7194-2LH02-0AD0**
PUR line, pre-assembled at both ends, 2 M8 connectors. 0.2 m	**6ES7194-2MH02-0AD0**
Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
PUR line, pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2MH02-1AA0**
0.3 m	**6ES7194-2MH03-1AA0**
1 m	**6ES7194-2MH10-1AA0**
2 m	**6ES7194-2MH20-1AA0**
5 m	**6ES7194-2MH50-1AA0**
10 m	**6ES7194-2MN10-1AA0**
15 m	**6ES7194-2MN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
PUR line, pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2MH03-1AB0**
1 m	**6ES7194-2MH10-1AB0**
2 m	**6ES7194-2MH20-1AB0**
5 m	**6ES7194-2MH50-1AB0**
10 m	**6ES7194-2MN10-1AB0**
15 m	**6ES7194-2MN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
PUR line, pre-assembled at one end, M8 socket	
2 m	**6ES7194-2MH20-1AC0**
5 m	**6ES7194-2MH50-1AC0**
10 m	**6ES7194-2MN10-1AC0**

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Selection and ordering data (continued)

15 m	**6ES7194-2MN15-1AC0**
M8 connector for ET connection 4-pin, shielded	**6ES7194-2AB00-0AA0**
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool Stripping tool for stripping the ET connection bus cable	**6ES7194-2KA00-0AA0**

Technical specifications

Article number	6ES7194-2LH02--0AA0	6ES7194-2LH03--0AA0	6ES7194-2LH10--0AA0	6ES7194-2LH20--0AA0	6ES7194-2LH50--0AA0	6ES7194-2LN10--0AA0	6ES7194-2LN15--0AA0
	Connecting Cable ET-Connection, 0,19m	Connecting Cable ET-Connection, 0,3m	Connecting Cable ET-Connection, 1,0M	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
General information							
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection							
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables							
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green	green

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Technical specifications (continued)

Article number	6ES7194-2LH02--0AA0	6ES7194-2LH03--0AA0	6ES7194-2LH10--0AA0	6ES7194-2LH20--0AA0	6ES7194-2LH50--0AA0	6ES7194-2LN10--0AA0	6ES7194-2LN15--0AA0
	Connecting Cable ET-Connection, 0,19m	Connecting Cable ET-Connection, 0,3m	Connecting Cable ET-Connection, 1,0M	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE	PE	PE	PE
Material property							
• Halogen-free	No	No	No	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2MH02--0AA0	6ES7194-2MH03--0AA0	6ES7194-2MH10--0AA0	6ES7194-2MH20--0AA0	6ES7194-2MH50--0AA0	6ES7194-2MN10-0AA0	6ES7194-2MN15-0AA0
	Connecting Cable ET-Connection, 0,19m	Connecting Cable ET-Connection, 0,3m	Connecting Cable ET-Connection, 1,0M	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
General information							
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection							
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables							
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green	green

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Technical specifications (continued)

Article number	6ES7194-2MH02-0AA0	6ES7194-2MH03-0AA0	6ES7194-2MH10-0AA0	6ES7194-2MH20-0AA0	6ES7194-2MH50-0AA0	6ES7194-2MN10-0AA0	6ES7194-2MN15-0AA0
	Connecting Cable ET-Connection, 0,19m	Connecting Cable ET-Connection, 0,3m	Connecting Cable ET-Connection, 1,0M	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PUR	PUR	PUR	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE	PE	PE	PE
Material property							
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH03-0-AB0	6ES7194-2LH10-0-AB0	6ES7194-2LH20-0-AB0	6ES7194-2LH50-0-AB0	6ES7194-2LN10-0-AB0	6ES7194-2LN15-0-AB0
	Connecting Cable ET-Con., angled, 0,3m	Connecting Cable ET-Con., angled, 1,0M	Connecting Cable ET-Con., angled, 2,0M	Connecting Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
General information						
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection						
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables						
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm

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Technical specifications (continued)

Article number	6ES7194-2LH03-0-AB0	6ES7194-2LH10-0-AB0	6ES7194-2LH20-0-AB0	6ES7194-2LH50-0-AB0	6ES7194-2LN10-0-AB0	6ES7194-2LN15-0-AB0
	Connecting Cable ET-Con., angled, 0,3m	Connecting Cable ET-Con., angled, 1,0M	Connecting Cable ET-Con., angled, 2,0M	Connecting Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE	PE	PE
Material property						
• Halogen-free	No	No	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2MH03-0-AB0	6ES7194-2MH10-0-AB0	6ES7194-2MH20-0-AB0	6ES7194-2MH50-0-AB0	6ES7194-2MN10-0-AB0	6ES7194-2MN15-0-AB0
	Connecting Cable ET-Con., angled, 0,3m	Connecting Cable ET-Con., angled, 1,0M	Connecting Cable ET-Con., angled, 2,0M	Connecting Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
General information						
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection						
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables						
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm

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Technical specifications (continued)

Article number	6ES7194-2MH03-0-AB0	6ES7194-2MH10-0-AB0	6ES7194-2MH20-0-AB0	6ES7194-2MH50-0-AB0	6ES7194-2MN10-0-AB0	6ES7194-2MN15-0-AB0
	Connecting Cable ET-Con., angled, 0,3m	Connecting Cable ET-Con., angled, 1,0M	Connecting Cable ET-Con., angled, 2,0M	Connecting Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PUR	PUR	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE	PE	PE
Material property						
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH20-0AC0	6ES7194-2LH50-0AC0	6ES7194-2LN10-0AC0	6ES7194-2LN15-0AC0
	Connecting Cable ET-Connection, 2,0M	Connecting Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
General information				
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm

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Technical specifications (continued)

Article number	6ES7194-2LH20-0AC0 Connecting Cable ET-Connection, 2,0M	6ES7194-2LH50-0AC0 Connecting Cable ET-Connection, 5,0M	6ES7194-2LN10-0AC0 Bus Cable ET-Connection, 10m	6ES7194-2LN15-0AC0 Bus Cable ET-Connection, 15m
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes

Article number	6ES7194-2MH20-0AC0 Connecting Cable ET-Connection, 2,0M	6ES7194-2MH50-0AC0 Connecting Cable ET-Connection, 5,0M	6ES7194-2MN10-0AC0 Bus Cable ET-Connection, 10m	6ES7194-2MN15-0AC0 Bus Cable ET-Connection, 15m
General information				
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm

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Technical specifications (continued)

Article number	6ES7194-2MH20-0AC0 Connecting Cable ET-Connection, 2,0M	6ES7194-2MH50-0AC0 Connecting Cable ET-Connection, 5,0M	6ES7194-2MN10-0AC0 Bus Cable ET-Connection, 10m	6ES7194-2MN15-0AC0 Bus Cable ET-Connection, 15m
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH02--1AA0 Power Cable M8, 0,19m	6ES7194-2LH03--1AA0 Power Cable M8, 0,3m	6ES7194-2LH10--1AA0 Power Cable M8, 1,0M	6ES7194-2LH20--1AA0 Power Cable M8, 2,0M	6ES7194-2LH50--1AA0 Power Cable M8, 5,0M	6ES7194-2LN10--1AA0 Power Cable M8, 10m	6ES7194-2LN15--1AA0 Power Cable M8, 15m
General information							
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection							
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables							
Cable designation	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC	PVC

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Technical specifications (continued)

Article number	6ES7194-2LH02--1AA0	6ES7194-2LH03--1AA0	6ES7194-2LH10--1AA0	6ES7194-2LH20--1AA0	6ES7194-2LH50--1AA0	6ES7194-2LN10--1AA0	6ES7194-2LN15--1AA0
	Power Cable M8, 0,19m	Power Cable M8, 0,3m	Power Cable M8, 1,0M	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
Material of core insulation	PP	PP	PP	PP	PP	PP	PP
Material property							
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2MH02--1AA0	6ES7194-2MH03--1AA0	6ES7194-2MH10--1AA0	6ES7194-2MH20--1AA0	6ES7194-2MH50--1AA0	6ES7194-2MN1-0-1AA0	6ES7194-2MN1-5-1AA0
	Power Cable M8 0,19m	Power Cable M8, 0,3m	Power Cable M8, 1,0M	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
General information							
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection							
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions							
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables							
Cable designation	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP	PP	PP	PP
Material property							
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7194-2LH03-1-AB0	6ES7194-2LH10-1-AB0	6ES7194-2LH20-1-AB0	6ES7194-2LH50-1-AB0	6ES7194-2LN10-1-AB0	6ES7194-2LN15-1-AB0
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
General information						
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection						
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables						
Cable designation	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP	PP	PP
Material property						
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7194-2MH03-1-AB0	6ES7194-2MH10-1-AB0	6ES7194-2MH20-1-AB0	6ES7194-2MH50-1-AB0	6ES7194-2MN10-1-AB0	6ES7194-2MN15-1-AB0
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
General information						
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection						
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions						
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables						
Cable designation	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²	LIF9Y11YFHF 4x 0.50 mm²
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP	PP	PP
Material property						
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7194-2LH20-1AC0 Power Cable M8, 2,0M	6ES7194-2LH50-1AC0 Power Cable M8, 5,0M	6ES7194-2LN10-1AC0 Power Cable M8, 10m	6ES7194-2LN15-1AC0 Power Cable M8, 15m
General information				
Product type designation	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP
Material property				
• Silicone-free	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH02-0AD0 Connecting Cable ET-Connection, 0,2m	6ES7194-2MH02-0AD0 Connecting cable ET-Connection 0,2m
General information		
Product type designation	Connecting cable for bus cable	Connecting cable for bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 sockets, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 sockets, 4-pin, shielded
Suitability for use	For connecting two ET CONNECTION bus cables	For connecting two ET CONNECTION bus cables
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during assembly, min.	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C
Cables		
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires

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Technical specifications (continued)

Article number	6ES7194-2LH02-0AD0 Connecting Cable ET-Connection, 0,2m	6ES7194-2MH02-0AD0 Connecting cable ET-Connection 0,2m
Cable length	0.2 m	0.2 m
Number of electrical cores	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm
Permissible bending radius, single bend, min.	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm
Color of cable sheath	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km
Mechanics/material		
Outgoing feeder type	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PUR
Material of core insulation	PE	PE
Material property		
• Halogen-free	No	Yes
• Silicone-free	Yes	Yes

Article number	6ES7194-2AB00-0AA0 M8 Connector ET-Connection
General information	
Product type designation	Connection plug
Product description	M8 plug connector with high degree of protection, 4-pin, metal version
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection	
IP degree of protection	IP65/67
Ambient conditions	
Ambient temperature during assembly, min.	-30 °C
Ambient temperature during assembly, max.	80 °C
Mechanics/material	
Outgoing feeder type	180° cable outlet
Material of housing	metal
Dimensions	
Width	14 mm
Depth	47 mm

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Overview



The PD 24VDC Power Distributor simplifies the power supply to an ET 200AL station. The power distributor distributes the supplied 2x 15 A between 4 different load groups, each with 2x 4 A, which can be used to supply the interface and I/O modules. The load groups are electronically protected against short-circuit.

Selection and ordering data

SIMATIC ET 200AL, PD 24VDC Power Distributor 1xM12-L, 4xM8, degree of protection IP67	**6ES7194-2CA00-0AA0**

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Technical specifications

Article number	6ES7194-2CA00-0AA0 ET 200AL, Power Distributor 24VDC
General information	
Product type designation	PD 24 V DC
Product description	voltage distributor for the distribution of centrally supplied supply voltage to 4x M8 sockets with integrated electronic short-circuit protection
Suitability for use	for supplying the ET 200AL modules with 1L+ and 2L+ voltages
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Output current	
Output current, max.	15 A; each for 1L+ and 2L+
per output	4 A; each for 1L+ and 2L+
Short-circuit protection	Yes; Electronic
Interrupts/diagnostics/status information	
LED status display	green LED "1L" and "2L" for input and output voltage
Potential separation	
between the load voltages	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety functions	No
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
• remark on safety-oriented shutdown	https://support.industry.siemens.com/cs/de/en/view/39198632
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions, see manual for details
Connection method	
Design of electrical connection at output	4x M8 socket, 4-pin
Type of electrical connection for mains supply line	1x M12 plug, L-coded, 4-pin
• connectable cable cross-section for mains supply line, max.	2.5 mm²
Dimensions	
Width	45 mm
Height	159 mm
Depth	45 mm
Weights	
Weight, approx.	200 g

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Overview

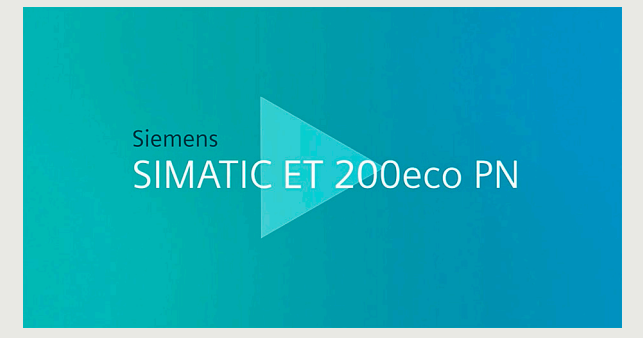
- Labels for the identification of channels, modules and slots of ET 200AL components
- Can be used for interface modules and I/O modules

Selection and ordering data

Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

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Overview



SIMATIC ET 200eco PN video



- Compact block I/O for processing digital, fail-safe digital, analog and IO-Link signals for connecting to bus systems with Ethernet-based protocols PROFINET, EtherNet/IP and Modbus TCP
- Cabinet-free installation in degree of protection IP65/67/69K with M12 connection method
- Extremely rugged and resistant metal enclosure
- Housing type of the I/O devices with 2x M12 L-coded power connectors
  - 45 mm x 200 mm x 48 mm (W x H x D) with 8 x M12 for digital signals and IO-Link
- Fieldbus connection: 2 x M12 D-coded and automatic PROFINET addressing
- Shared device
- MSI/MSO
- Monitoring of supply voltage 1L+ and load voltage 2L+
- Fast startup
- Channel-specific diagnostics, identification and maintenance data IM0 ... IM3
- Firmware update
- Range of ambient temperature -40 °C to 60 °C
- Can be used in hazardous areas in zones 2 and 22
- Can be used outdoors

Overview (continued)

- Increase in communication availability due to Media Redundancy Protocol (MRP) on PROFINET as well as operation on S7-1500 R/H or S7-400H by means of S2 redundancy
- Variants of the I/O devices with M12 L-coded power connectors:
  - DI 8
  - DI 16
  - DQ 8 (0.5 A)
  - DQ 8 (2 A)
  - DIQ 16 (0.5A/2A)
  - 8 IO-Link + DI 4
  - 8 IO-Link + DIQ 8
  - 4 IO-Link + DIQ 12
  - AI 8 (TC, RTD)
  - AIQ 8 (U, I)
  - TM PosInput 2

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Overview



- Digital I/O devices with 2x M12 L-coded power connectors and 45 mm width
  - 8 digital input signals with 8xM12 connection
  - 16 digital input signals with 8xM12 connection
  - 8 digital output signals 8-channel digital output module 0.5 A with 8xM12 connection
  - 8 digital output signals 2 A with 8xM12 connection
  - 16 digital input/output signals 0.5A/2A with 8xM12 connection

Selection and ordering data

ET 200eco PN digital input modules	
• DI 8 x 24 V DC; 8 x M12, single and dual assignment, degree of protection IP67	**6ES7141-6BG00-0BB0**
• DI 16 x 24 V DC, 8 x M12, dual assignment, degree of protection IP67	**6ES7141-6BH00-0BB0**
ET 200eco PN digital output modules	
• DQ 8 x 24 V DC/0.5 A; 8 x M12, single and dual assignment, degree of protection IP67	**6ES7142-6BG00-0BB0**
• DQ 8 x 24 V DC/2 A; 8 x M12, single and dual assignment, degree of protection IP67	**6ES7142-6BR00-0BB0**
ET 200eco PN digital input/output modules	
• DIQ 16 x 24 V DC/0.5 A/2 A; dual assignment, degree of protection IP67	**6ES7143-6BH00-0BB0**
Accessories	
• PD 24VDC power distributor; 1 x 7/8", 4 x M12	**6ES7148-6CB00-0AA0**
• Terminal block for ET 200eco PN, 10 A insulation displacement terminals	**6ES7194-6CA00-0AA0**
• Spare fuses for terminal block, 10 units	**6ES7194-6HB00-0AA0**
• Mounting rail 0.5 m	**6ES7194-6GA00-0AA0**
• Profile screw for mounting rail, 50 units	**6ES7194-6MA00-0AA0**
• Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units	**3RX9802-0AA00**
• Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units	**3RK1901-1KA00**
• Labels 10 mm x 5 mm RAL9016, for I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**
• Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each	**3RT2900-1SB10**
PROFINET M12 connection plug, for user assembly	
Connector for PROFINET, 4-core, shielded	**3RK1902-2DA00**
IE M12 plug PRO connector	
• 1 unit	**6GK1901-0DB10-6AA0**
• 8 units	**6GK1901-0DB10-6AA8**
IE FC M12 plug PRO connector, for user assembly	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
M12 connection plug for 24 V DC load power supply	
Connection socket for 24 V DC infeed; 4-pin, A-coded, 3 units	**6GK1907-0DC10-6AA3**
Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units	**6GK1907-0DB10-6AA3**
Power M12 plug PRO	**6GK1906-0EA00**
Connector for 24 V DC supply voltage, with installation instructions, 4-pin, L-coded, 1 unit	
Power M12 cable connector PRO	**6GK1906-0EB00**
Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit	
M12 circular connector	
Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm^2, A-coded, max. 4 A	
• Straight	**3RK1902-4BA00-5AA0**
• Angled	**3RK1902-4DA00-5AA0**

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Selection and ordering data (continued)

M12 coupling socket 4-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A, angled	**3RK1902-4CA00-4AA0**
PROFINET bus cable Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded	
• 3 m	**3RK1902-2HB30**
• 5 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
M12-90/M12-90 IE connecting cable Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet Length:	
• 0.3 m	**6XV1870-8GE30**
• 0.5 m	**6XV1870-8GE50**
• 1.0 m	**6XV1870-8GH10**
• 1.5 m	**6XV1870-8GH15**
• 2.0 m	**6XV1870-8GH20**
• 3.0 m	**6XV1870-8GH30**
• 5.0 m	**6XV1870-8GH50**
• 10 m	**6XV1870-8GN10**
• 15 m	**6XV1870-8GN15**
M12-180/IE FC RJ45 plug-145 IE connecting cable Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67 Length:	
• 2.0 m	**6XV1871-5TH20**
• 3.0 m	**6XV1871-5TH30**
• 5.0 m	**6XV1871-5TH50**
• 10 m	**6XV1871-5TN10**
• 15 m	**6XV1871-5TN15**
M12-180/M12-180 IE robust connecting cable Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length:	
• 1.0 m	**6XV1881-5AH10**
• 2.0 m	**6XV1881-5AH20**
• 3.0 m	**6XV1881-5AH30**
• 5.0 m	**6XV1881-5AH50**
M12 Y-cable For double connection of I/O by means of a single cable to ET 200, 5-pin	**6ES7194-6KA00-0XA0**
Control line Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	
• 1.5 m	**3RK1902-4HB15-5AA0**
• 5 m	**3RK1902-4HB50-5AA0**
• 10 m	**3RK1902-4HC01-5AA0**
Preassembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	**3RK1902-4PB15-3AA0**

Selection and ordering data (continued)

IO-Link connecting cables Between IO-Link master and reader, on both sides with M12 plug, 4-pin	
• 5 m	**6GT2891-4MH50**
• 10 m	**6GT2891-4MN10**
Energy cable 4 x 1.5 Trailable power cable, with 4 copper cores (1.5 mm2) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1801-2B**
M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length:	
• 0.3 m	**6XV1801-5GE30**
• 0.5 m	**6XV1801-5GE50**
• 1.0 m	**6XV1801-5GH10**
• 1.5 m	**6XV1801-5GH15**
• 2.0 m	**6XV1801-5GH20**
• 3.0 m	**6XV1801-5GH30**
• 5.0 m	**6XV1801-5GH50**
• 10 m	**6XV1801-5GN10**
• 15 m	**6XV1801-5GN15**
M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length:	
• 0.5 m	**6XV1801-6GE50**
• 1.0 m	**6XV1801-6GH10**
• 1.5 m	**6XV1801-6GH15**
• 2.0 m	**6XV1801-6GH20**
• 3.0 m	**6XV1801-6GH30**
• 5.0 m	**6XV1801-6GH50**
• 10 m	**6XV1801-6GN10**
• 15 m	**6XV1801-6GN15**
M12-180/M12-180 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length:	
• 0.5 m	**6XV1801-6DE50**
• 1.0 m	**6XV1801-6DH10**
• 1.5 m	**6XV1801-6DH15**
• 2.0 m	**6XV1801-6DH20**
• 3.0 m	**6XV1801-6DH30**
• 5.0 m	**6XV1801-6DH50**
• 10 m	**6XV1801-6DN10**
• 15 m	**6XV1801-6DN15**

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Selection and ordering data (continued)

M12-180/M12-180 **M12 robust power connecting cable** Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length:	
• 1.0 m	**6XV1801-5AH10**
• 2.0 m	**6XV1801-5AH20**
• 3.0 m	**6XV1801-5AH30**
• 5.0 m	**6XV1801-5AH50**

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Technical specifications

Article number	6ES7141-6BG00-0BB0 ET 200eco PN, DI 8x24VDC, M12-L	6ES7141-6BH00-0BB0 ET 200eco PN, DI 16x24VDC, M12-L
General information		
Product function		
• Isochronous mode	Yes	Yes
• IRT	Yes	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0363	STEP 7 V17 or higher with HSP 0363
• PROFINET from GSD version/GSD revision	GSDML V2.4.x	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1	from V1.3 SP1
Operating mode		
• DI	Yes	Yes
• Counter	No	No
• MSI	Yes	Yes
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current		
Current consumption (rated value)	85 mA; without load	90 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value	12 A; Maximum value
Encoder supply		
Number of outputs	8	8
Digital inputs		
Number of digital inputs	8	16
Digital inputs, parameterizable	Yes	Yes
Sourcing/sinking input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 60 °C, max.	8	16
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.4 mA	2.4 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- Parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types		
• M12 port	Yes; 2x M12, 4-pin, D-coded	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2	2
• integrated switch	Yes	Yes

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Technical specifications (continued)

Article number	6ES7141-6BG00-0BB0 ET 200eco PN, DI 8x24VDC, M12-L	6ES7141-6BH00-0BB0 ET 200eco PN, DI 16x24VDC, M12-L
Protocols		
• PROFINET IO device	Yes	Yes
• Open IE communication	Yes	Yes
PROFINET IO Device		
- Services		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	No	No
EtherNet/IP	Yes	Yes
Modbus TCP	Yes	Yes
Redundancy mode		
• PROFINET system redundancy (S2)	Yes	Yes
• PROFINET system redundancy (R1)	No	No
• H-Sync forwarding	Yes	Yes
- Media redundancy		
- MRP	Yes	Yes
- MRPD	No	No
EtherNet/IP		
- Services		
- CIP Implicit Messaging	Yes	Yes
- CIP Explicit Messaging	Yes	Yes
- CIP Safety	No	No
- Shared device	Yes; 2x EtherNet/IP Scanner	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2	2
- Updating times		
- Requested Packet Interval (RPI)	2 ms	2 ms
- Redundancy mode		
- DLR (Device Level Ring)	No	No
- Address area		
- Address space per module, max.	20 byte	20 byte
- LargeForwardOpen (Class3)	No	No
Modbus TCP		
- Services		
- read coils (code=1)	Yes	Yes
- read discrete inputs (code=2)	Yes	Yes
- Read Holding Registers (Code=3)	Yes	Yes
- write single coil (code=5)	Yes	Yes
- write multiple coils (code=15)	Yes	Yes
- Write Multiple Registers (Code=16)	Yes	Yes
- Parameter change by master	No	No
- Modbus TCP Security Protocol	No	No
- Address space per station		
- Address space per station, max.	20 byte	20 byte
- Access-consistent address space	2 byte	2 byte
- Updating time		
- I/O request interval	2 ms	2 ms
- Connections		

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Technical specifications (continued)

Article number	6ES7141-6BG00-0BB0 ET 200eco PN, DI 8x24VDC, M12-L	6ES7141-6BH00-0BB0 ET 200eco PN, DI 16x24VDC, M12-L
- number of connections per device	12	12
Open IE communication		
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ARP	Yes	Yes
Isochronous mode		
Equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- Parameterizable	Yes	Yes
• Wire break	Yes; DI, input current < 0.3 mA, per channel	Yes; DI, input current < 0.3 mA, per channel
• Short-circuit encoder supply	Yes; Per channel group	Yes; Per channel group
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• NS LED	Yes; green/red LED	Yes; green/red LED
• MS LED	Yes; green/red LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• Connection display LINK TX/RX	Yes; green LED, only link	Yes; green LED, only link
Potential separation		
between the load voltages	Yes	Yes
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP65/67/69K	IP65/67/69K
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; from FS01	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Use in hazardous areas		
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22	ATEX, UKEX, IECEx, CCCEx for Zone 22
Security		
signed firmware update	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C

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Technical specifications (continued)

Article number	6ES7141-6BG00-0BB0 ET 200eco PN, DI 8x24VDC, M12-L	6ES7141-6BH00-0BB0 ET 200eco PN, DI 16x24VDC, M12-L
• max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded	M12, 4-pin, L-coded
Dimensions		
Width	45 mm	45 mm
Height	200 mm	200 mm
Depth	48 mm	48 mm
Weights		
Weight, approx.	780 g	780 g

Article number	6ES7142-6BG00-0BB0 ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	6ES7142-6BR00-0BB0 ET 200eco PN, DQ 8x24VDC/2A, M12-L
General information		
Product function		
• Isochronous mode	Yes	Yes
• IRT	Yes	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0363	STEP 7 V17 or higher with HSP 0363
• PROFINET from GSD version/GSD revision	GSDML V2.4.x	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1	from V1.3 SP1
Operating mode		
• DQ	Yes	Yes
• MSO	Yes	Yes
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction
Input current		
Current consumption (rated value)	65 mA; without load	65 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value	12 A; Maximum value
Digital outputs		
Number of digital outputs	8	8
Current-sourcing	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes	
output type acc. to IEC 61131, type 2		Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	Typ. 2L+ (-52 V)	Type -14 V
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	2 A
• with inductive load, max.	0.5 A	2 A
• on lamp load, max.	5 W	10 W
Load resistance range		
• lower limit	48 Ω	12 Ω
• upper limit	4 kΩ	4 kΩ

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Technical specifications (continued)

Article number	6ES7142-6BG00-0BB0 ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	6ES7142-6BR00-0BB0 ET 200eco PN, DQ 8x24VDC/2A, M12-L
Output voltage		
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)
Output current		
• for signal "1" rated value	0.5 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.2 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
Total current of the outputs		
• Current per module, max.	4 A	8 A
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types		
• M12 port	Yes; 2x M12, 4-pin, D-coded	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO Device	Yes	Yes
• Open IE communication	Yes	Yes
PROFINET IO Device		
- Services		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	No	No
EtherNet/IP	Yes	Yes
Modbus TCP	Yes	Yes
Redundancy mode		
• PROFINET system redundancy (S2)	Yes	Yes
• PROFINET system redundancy (R1)	No	No
• H-Sync forwarding	Yes	Yes
- Media redundancy		
- MRP	Yes	Yes
- MRPD	No	No
EtherNet/IP		
- Services		
- CIP Implicit Messaging	Yes	Yes
- CIP Explicit Messaging	Yes	Yes

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Technical specifications (continued)

Article number	6ES7142-6BG00-0BB0 ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	6ES7142-6BR00-0BB0 ET 200eco PN, DQ 8x24VDC/2A, M12-L
- CIP Safety	No	No
- Shared device	Yes; 2x EtherNet/IP Scanner	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2	2
- Updating times		
- Requested Packet Interval (RPI)	2 ms	2 ms
- Redundancy mode		
- DLR (Device Level Ring)	No	No
- Address area		
- Address space per module, max.	20 byte	20 byte
- LargeForwardOpen (Class3)	No	No
Modbus TCP		
- Services		
- read coils (code=1)	Yes	Yes
- read discrete inputs (code=2)	Yes	Yes
- Read Holding Registers (Code=3)	Yes	Yes
- write single coil (code=5)	Yes	Yes
- write multiple coils (code=15)	Yes	Yes
- Write Multiple Registers (Code=16)	Yes	Yes
- Parameter change by master	No	No
- Modbus TCP Security Protocol	No	No
- Address space per station		
- Address space per station, max.	20 byte	20 byte
- Access-consistent address space	2 byte	2 byte
- Updating time		
- I/O request interval	2 ms	2 ms
- Connections		
- number of connections per device	12	12
Open IE communication		
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ARP	Yes	Yes
Isochronous mode		
Equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
Interrupts/diagnostics/status information		
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- Parameterizable	Yes	Yes
• Wire break	Yes	Yes
• short-circuit	Yes; Outputs to M; channel by channel	Yes; Outputs to M; channel by channel
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• NS LED	Yes; green/red LED	Yes; green/red LED
• MS LED	Yes; green/red LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs	Yes; red/green/yellow LEDs

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Technical specifications (continued)

Article number	6ES7142-6BG00-0BB0 ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	6ES7142-6BR00-0BB0 ET 200eco PN, DQ 8x24VDC/2A, M12-L
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link	Yes; green LED, only link
Potential separation		
between the load voltages	Yes	Yes
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	No
• between the channels and the power supply of the electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67/69K	IP65/67/69K
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Use in hazardous areas		
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22	ATEX, UKEX, IECEx, CCCEx for Zone 22
Security		
signed firmware update	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded	M12, 4-pin, L-coded
Dimensions		
Width	45 mm	45 mm
Height	200 mm	200 mm
Depth	48 mm	48 mm
Weights		
Weight, approx.	780 g	780 g

Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0363
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1
Operating mode	

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Technical specifications (continued)

Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
• DI	Yes
• Counter	No
• DQ	Yes
• MSI	Yes
• MSO	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	90 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Digital inputs	
Number of digital inputs	16; Parameterizable as DIQ
• in groups of	8
Digital inputs, parameterizable	Yes
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
- all mounting positions	
- up to 60 °C, max.	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.4 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Number of digital outputs	16; Parameterizable as DIQ
• in groups of	8; 2 load groups for 8 outputs each
Current-sourcing	Yes
output type acc. to IEC 61131, type 0.5	Yes
output type acc. to IEC 61131, type 2	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	0.5 A: Type 1L+ (-70 V) / 2 A: Type (-18 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A / 2 A
• with inductive load, max.	0.5 A / 2 A
• on lamp load, max.	0.5 A: 5 W / 2 A 10 W
Load resistance range	
• lower limit	0.5 A: 48 ohms / 2 A: 12 ohms
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	1L+ (-0.8 V) / 2L+ (-0.8 V)
Output current	

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Technical specifications (continued)

Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
• for signal "1" rated value	0.5 A / 2 A
• for signal "0" residual current, max.	0.1 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	0.5 A: 100 Hz / 2 A: 40 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per group, max.	1L+: 2 A / 2L+: 6 A
• Current per module, max.	8 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	No
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes

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Technical specifications (continued)

Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Redundancy mode	
- DLR (Device Level Ring)	No
- Address area	
- Address space per module, max.	20 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	20 byte
- Access-consistent address space	2 byte
- Updating time	
- I/O request interval	2 ms
- Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- Parameterizable	Yes
• Wire break	Yes; DI, input current < 0.3 mA, per channel
• short-circuit	Yes; Outputs to M and P; channel by channel
• Short-circuit encoder supply	Yes; Per channel group
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• For load voltage monitoring	Yes; green LED

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Technical specifications (continued)

Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	Yes
• between the channels, in groups of	8
• between the channels and the power supply of the electronics	8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Use in hazardous areas	
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22
Security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	
Weight, approx.	780 g

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Overview



Analog distributed I/O devices with 2x M12 L-coded power connectors and 45 mm width

- 8 analog input signals RTD/TC with 8xM12 connection
- 6 analog input signals U/I and 2 analog input or output signals U/I with 8xM12 connection

Selection and ordering data

ET 200eco PN analog input modules	
• 8 AI RTD/TC; 8 x M12-L, degree of protection IP67	**6ES7144-6JF00-0BB0**
ET 200eco PN analog input/output modules	
• 6 AI U/I, 2 AI/AQ U/I, 8 x M12, degree of protection IP67	**6ES7146-6HF00-0BB0**
Accessories	
• PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12	**6ES7148-6CB00-0AA0**
• Terminal block for ET 200eco PN, 10 A insulation displacement terminals	**6ES7194-6CA00-0AA0**
• Spare fuses for terminal block, 10 units	**6ES7194-6HB00-0AA0**
• Mounting rail 0.5 m	**6ES7194-6GA00-0AA0**
• Profile screw for mounting rail, 50 units	**6ES7194-6MA00-0AA0**
• Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units	**3RX9802-0AA00**
• Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units	**3RK1901-1KA00**
• Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each	**3RT2900-1SB10**
PROFINET M12 connection plug, for user assembly	
Connector for PROFINET, 4-core, shielded	**3RK1902-2DA00**
IE M12 plug PRO connector	
• 1 unit	**6GK1901-0DB10-6AA0**
• 8 units	**6GK1901-0DB10-6AA8**
IE FC M12 plug PRO connector, for user assembly	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
M12 connection plug for 24 V DC load power supply	
Connection socket for 24 V DC infeed; 4-pin, A-coded, 3 units	**6GK1907-0DC10-6AA3**
Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units	**6GK1907-0DB10-6AA3**
M12 circular connector	
Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm^2, A-coded, max. 4 A	
• Straight	**3RK1902-4BA00-5AA0**
• Angled	**3RK1902-4DA00-5AA0**
M12 coupling socket	**3RK1902-4CA00-4AA0**
4-pin, screw terminal, max. 0.75 mm^2, A-coded, max. 4 A, angled	
PROFINET bus cable	
Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded	
• 3 m	**3RK1902-2HB30**
• 5 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
IE connecting cable M12-90/M12-90	
Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet Length:	
• 0.3 m	**6XV1870-8GE30**
• 0.5 m	**6XV1870-8GE50**
• 1.0 m	**6XV1870-8GH10**
• 1.5 m	**6XV1870-8GH15**

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Selection and ordering data (continued)

• 2.0 m	**6XV1870-8GH20**
• 3.0 m	**6XV1870-8GH30**
• 5.0 m	**6XV1870-8GH50**
• 10 m	**6XV1870-8GN10**
• 15 m	**6XV1870-8GN15**
IE connecting cable M12-180/IE FC RJ45 plug-145 Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67 Length:	
• 2.0 m	**6XV1871-5TH20**
• 3.0 m	**6XV1871-5TH30**
• 5.0 m	**6XV1871-5TH50**
• 10 m	**6XV1871-5TN10**
• 15 m	**6XV1871-5TN15**
M12-180/M12-180 IE robust connecting cable Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length:	
• 1.0 m	**6XV1881-5AH10**
• 2.0 m	**6XV1881-5AH20**
• 3.0 m	**6XV1881-5AH30**
• 5.0 m	**6XV1881-5AH50**
M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length:	
• 0.3 m	**6XV1801-5GE30**
• 0.5 m	**6XV1801-5GE50**
• 1.0 m	**6XV1801-5GH10**
• 1.5 m	**6XV1801-5GH15**
• 2.0 m	**6XV1801-5GH20**
• 3.0 m	**6XV1801-5GH30**
• 5.0 m	**6XV1801-5GH50**
• 10 m	**6XV1801-5GN10**
• 15 m	**6XV1801-5GN15**
M12-180/M12-180 M12 robust power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length:	
• 1.0 m	**6XV1801-5AH10**
• 2.0 m	**6XV1801-5AH20**
• 3.0 m	**6XV1801-5AH30**
• 5.0 m	**6XV1801-5AH50**

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Technical specifications

Article number	6ES7144-6JF00-0BB0 ET 200eco PN, AI 8xRTD/TC, M12-L
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
• Measuring range scalable	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0369
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1
Operating mode	
• MSI	Yes
CiR - Configuration in RUN	
Calibration possible in RUN	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	85 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Analog inputs	
Number of analog inputs	8
Constant measurement current for resistance-type transmitter, typ.	0.7 mA
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages	
• -80 mV to +80 mV	Yes; 16 bit incl. sign
Input ranges (rated values), thermocouples	
• type B	Yes; 16 bit incl. sign
• type C	Yes; 16 bit incl. sign
• Type E	Yes; 16 bit incl. sign
• Type J	Yes; 16 bit incl. sign
• Type K	Yes; 16 bit incl. sign
• Type L	Yes; 16 bit incl. sign
• Type N	Yes; 16 bit incl. sign
• Type R	Yes; 16 bit incl. sign
• Type S	Yes; 16 bit incl. sign
• Type T	Yes; 16 bit incl. sign
• Type U	Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer	
• Ni 100	Yes; Standard/climate
• Ni 1000	Yes; Standard/climate
• Ni 120	Yes; Standard/climate
• Ni 200	Yes; Standard/climate
• Ni 500	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
• Pt 1000	Yes; Standard/climate
• Pt 200	Yes; Standard/climate
• Pt 500	Yes; Standard/climate
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes

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Technical specifications (continued)

Article number	6ES7144-6JF00-0BB0 ET 200eco PN, AI 8xRTD/TC, M12-L
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 3000 ohms	Yes
• 0 to 6000 ohms	Yes
Thermocouple (TC)	
- Temperature compensation	
- Parameterizable	Yes
- internal temperature compensation	Yes
- external temperature compensation with compensations socket	Yes
- dynamic reference temperature value	Yes
- fixed reference temperature	Yes
Cable length	
• shielded, max.	30 m
Analog value generation for the inputs	
Analog value display	SIMATIC S7 format
Measurement principle	integrating
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes; channel by channel
• Integration time (ms)	0.84 / 16.7 (50) / 20 (60) / 60 (180)
• Basic conversion time, including integration time (ms)	4.50 / 21.5 (54) / 24 (64) / 64 (184)
• Interference voltage suppression for interference frequency f1 in Hz	none / 60 / 50 / 16.7
Smoothing of measured values	
• Parameterizable	Yes
Encoder	
Connection of signal encoders	
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes
• for resistance measurement with four-wire connection	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %; ±0.1 % for resistance thermometers and resistance
Temperature error (relative to input range), (+/-)	0.0009 %/K; ±0.005 % / K at thermocouple
Crosstalk between the inputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %
Temperature error of internal compensation	±1,5 °C
Interference voltage suppression for f = n x (f1 +/- 0.5 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	100 dB; at basic conversion time 4.5 / 21.5 / 24 / 64 ms: 46 dB
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2

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Technical specifications (continued)

Article number	6ES7144-6JF00-0BB0 ET 200eco PN, AI 8xRTD/TC, M12-L
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	No
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Redundancy mode	
- DLR (Device Level Ring)	No
- Address area	
- Address space per module, max.	38 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	38 byte
- Access-consistent address space	2 byte
- Updating time	
- I/O request interval	2 ms
- Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Alarms	

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Technical specifications (continued)

Article number	6ES7144-6JF00-0BB0 ET 200eco PN, AI 8xRTD/TC, M12-L
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- Parameterizable	Yes
• Wire break	Yes; Not for ±80 mV
• Overflow/Underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	Yes
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes; based on AMS 2750 F
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Use in hazardous areas	
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22
Security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	
Width	45 mm
Height	200 mm

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Technical specifications (continued)

Article number	6ES7144-6JF00-0BB0 ET 200eco PN, AI 8xRTD/TC, M12-L
Depth	48 mm
Weights	
Weight, approx.	780 g

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher with HSP 0391
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5 or higher
Operating mode	
• MSI	Yes
• MSO	Yes
CiR - Configuration in RUN	
Calibration possible in RUN	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	110 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Actuator supply	
Number of outputs	2
Analog inputs	
Number of analog inputs	8; 6 AI fixed, 2 AIQ can be parameterized
Cycle time (all channels), min.	sum of the basic conversion times
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes; 17 V for 2-wire transformers
• -20 mA to +20 mA	Yes; 17 V for 2-wire transformers
• 4 mA to 20 mA	Yes; 17 V for 2-wire transformers
Cable length	
• shielded, max.	30 m
Analog outputs	
Number of analog outputs	2; AIQ can be parameterized
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	40 mA
Current output, no-load voltage, max.	19 V
Cycle time (all channels) max.	1 ms
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes

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Technical specifications (continued)

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
• for current output four-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	600 Ω
• with current outputs, inductive load, max.	1 mH
Cable length	
• shielded, max.	30 m
Analog value generation for the inputs	
Analog value display	SIMATIC S7 format
Measurement principle	integrating
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes; channel by channel
• Integration time (ms)	0.84 / 16.7 (50) / 20 (60) / 60 (180)
• Basic conversion time, including integration time (ms)	4.50 / 21.5 (54) / 24 (64) / 64 (184)
• Interference voltage suppression for interference frequency f1 in Hz	none / 60 / 50 / 16.7
Smoothing of measured values	
• Parameterizable	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
Settling time	
• for resistive load	1 ms
• for capacitive load	1 ms
• for inductive load	1 ms
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	0.002 %/K
Crosstalk between the outputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.008 %
Interference voltage suppression for f = n x (f1 +/- 0.5 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	100 dB; at basic conversion time 4.5 / 21.5 / 24 / 64 ms: 46 dB
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1

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Technical specifications (continued)

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	No
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Redundancy mode	
- DLR (Device Level Ring)	No
- Address area	
- Address space per module, max.	48 byte; of which 44 bytes for inputs and 4 bytes for outputs
- LargeForwardOpen (Class3)	No
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No

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Technical specifications (continued)

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	48 byte; of which 44 bytes for inputs and 4 bytes for outputs
- Access-consistent address space	2 byte
- Updating time	
- I/O request interval	2 ms
- Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- Parameterizable	Yes
• Wire break	Yes; at 4 mA to 20 mA and 1 V to 5 V
• short-circuit	Yes; encoder and actuator supply module to ground, for output type voltage; channel by channel
• Overflow/Underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Use in hazardous areas	
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22

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Technical specifications (continued)

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
Security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	
Weight, approx.	795 g

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Overview



Technical properties

- Counter and position detection module for ET 200eco PN
- Interfaces:
  - Encoder signals A, B and N for RS 422 differential signals or 24 V signals
  - SSI interface with clock and data for RS422 differential signals
  - 24 V encoder supply, short-circuit-proof
  - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
  - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counting frequency 1 MHz (4 MHz with fourfold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable input filters for suppressing interferences at encoder and digital inputs

Supported types of encoders/signals

- Incremental encoders with and without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 32 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Selection and ordering data

TM PosInput 2 counter and position detection module 2 channels, max. 1 MHz for RS-422 differential signals or SSI absolute encoders 200 kHz for 24 V count signals	**6ES7147-6AB00-0BB0**
Accessories	
• Mounting rail 0.5 m	**6ES7194-6GA00-0AA0**
• Profile screw for mounting rail, 50 units	**6ES7194-6MA00-0AA0**
• Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units	**3RX9802-0AA00**
• Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units	**3RK1901-1KA00**
• Labels 10 mm x 5 mm RAL9016, for I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**
PROFINET M12 connection plug, for user assembly	
Connector for PROFINET, 4-core, shielded	**3RK1902-2DA00**
IE M12 plug PRO connector	
• 1 unit	**6GK1901-0DB10-6AA0**
• 8 units	**6GK1901-0DB10-6AA8**
IE FC M12 plug PRO connector, for user assembly	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
Power M12 plug PRO Connector for 24 V DC supply voltage, with installation instructions, 4-pin, L-coded, 1 unit	**6GK1906-0EA00**
Power M12 cable connector PRO Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit	**6GK1906-0EB00**
M12 circular connector Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A	
• Straight	**3RK1902-4BA00-5AA0**
• Angled	**3RK1902-4DA00-5AA0**
M12 coupling socket 4-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A, angled	**3RK1902-4CA00-4AA0**
PROFINET bus cable Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded	
• 3 m	**3RK1902-2HB30**
• 5 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
M12-90/M12-90 IE connecting cable Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet Length:	
• 0.3 m	**6XV1870-8GE30**
• 0.5 m	**6XV1870-8GE50**
• 1.0 m	**6XV1870-8GH10**
• 1.5 m	**6XV1870-8GH15**
• 2.0 m	**6XV1870-8GH20**
• 3.0 m	**6XV1870-8GH30**
• 5.0 m	**6XV1870-8GH50**

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Selection and ordering data (continued)

• 10 m	**6XV1870-8GN10**
• 15 m	**6XV1870-8GN15**
M12-180/IE FC RJ45 plug-145 **IE connecting cable** Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67 Length:	
• 2.0 m	**6XV1871-5TH20**
• 3.0 m	**6XV1871-5TH30**
• 5.0 m	**6XV1871-5TH50**
• 10 m	**6XV1871-5TN10**
• 15 m	**6XV1871-5TN15**
M12-180/M12-180 **IE robust connecting cable** Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length:	
• 1.0 m	**6XV1881-5AH10**
• 2.0 m	**6XV1881-5AH20**
• 3.0 m	**6XV1881-5AH30**
• 5.0 m	**6XV1881-5AH50**
M12 Y-cable For double connection of I/O by means of a single cable to ET 200, 5-pin	**6ES7194-6KA00-0XA0**
Control line Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	
• 1.5 m	**3RK1902-4HB15-5AA0**
• 5 m	**3RK1902-4HB50-5AA0**
• 10 m	**3RK1902-4HC01-5AA0**
Preassembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	**3RK1902-4PB15-3AA0**
Energy cable 4 x 1.5 Trailable power cable, with 4 copper cores (1.5 mm2) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1801-2B**
M12-90/M12-90 **M12 power connecting cable** Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length:	
• 0.3 m	**6XV1801-5GE30**
• 0.5 m	**6XV1801-5GE50**
• 1.0 m	**6XV1801-5GH10**
• 1.5 m	**6XV1801-5GH15**
• 2.0 m	**6XV1801-5GH20**
• 3.0 m	**6XV1801-5GH30**
• 5.0 m	**6XV1801-5GH50**
• 10 m	**6XV1801-5GN10**
• 15 m	**6XV1801-5GN15**

Selection and ordering data (continued)

M12-90/M12-90 **M12 power connecting cable** Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length:	
• 0.5 m	**6XV1801-6GE50**
• 1.0 m	**6XV1801-6GH10**
• 1.5 m	**6XV1801-6GH15**
• 2.0 m	**6XV1801-6GH20**
• 3.0 m	**6XV1801-6GH30**
• 5.0 m	**6XV1801-6GH50**
• 10 m	**6XV1801-6GN10**
• 15 m	**6XV1801-6GN15**
M12-180/M12-180 **M12 power connecting cable** Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length:	
• 0.5 m	**6XV1801-6DE50**
• 1.0 m	**6XV1801-6DH10**
• 1.5 m	**6XV1801-6DH15**
• 2.0 m	**6XV1801-6DH20**
• 3.0 m	**6XV1801-6DH30**
• 5.0 m	**6XV1801-6DH50**
• 10 m	**6XV1801-6DN10**
• 15 m	**6XV1801-6DN15**
M12-180/M12-180 **M12 robust power connecting cable** Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length:	
• 1.0 m	**6XV1801-5AH10**
• 2.0 m	**6XV1801-5AH20**
• 3.0 m	**6XV1801-5AH30**
• 5.0 m	**6XV1801-5AH50**

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Technical specifications

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
General information	
Number of channels	2
Product function	
• Isochronous mode	Yes
• IRT	Yes
• Fast startup	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher with HSP
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5 or higher
Supply voltage	
Rated value (DC)	24 V
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; encoder power supply outputs applied with reversed polarity, loads conduct
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	100 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	4; 1 per encoder connection
Digital inputs	
Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	Yes
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- for technological functions	
- Parameterizable	Yes
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal

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Technical specifications (continued)

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
Limitation of inductive shutdown voltage to	2L+ (-39 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• with inductive load, max.	0.5 A
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; 2L+ (-0,8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
Parallel switching of two outputs	
• for uprating	No
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13
Total current of the outputs	
• Current per module, max.	2 A; Supply from 2L+
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	30 m
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	30 m
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	30 m; Up to 500 kHz
• Parity bit, parameterizable	Yes

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Technical specifications (continued)

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 500 µs to 4 ms at an interval of 125 µs
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	No
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Address area	
- Address space per module, max.	32 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes

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Technical specifications (continued)

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	32 byte
- Access-consistent address space	2 byte
- Updating time	
- I/O request interval	2 ms
- Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Isochronous mode	
Equidistance	Yes
shortest clock pulse	500 µs
max. cycle	4 ms
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	No
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- Parameterizable	Yes
• Wire break	Yes
• short-circuit	Yes
• Short-circuit encoder supply	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• For load voltage monitoring	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	No
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes

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Technical specifications (continued)

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
- Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
- Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
- Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	Yes; DI channels are isolated from the DQ channels
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Security	
signed firmware update	Yes; V5.1.2 or higher
safely removing data	Yes; V5.1.2 or higher
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection	4/5/8-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded

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Technical specifications (continued)

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	No
to standard PROFINET controller	Yes
Dimensions	
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	
Weight, approx.	820 g

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Overview





The ET 200eco PN fail-safe I/O device expands the ET 200eco PN system family. It is incorporated seamlessly into the Safety Integrated concept like with ET 200MP / ET 200SP and ET200pro. It also supports safety-related communication via PROFIsafe. The functional safety is certified in accordance with IEC 61508. It is designed for safety-related use up to SIL 3 according to IEC 62061 and PL e according to ISO 13849.

The following fail-safe I/O devices are available:

- F-DI 8x24 V /F-DQ 3x24 V 2 A with 2x M12 A-coded power connectors and 60 mm width
- F-DI 4x24 V DC + F-DQ 2x24 V DC/2 A PM + DIQ 4x24 V DC + CM 1xIO-Link with 2x M12 L-coded power connector and 45 mm width

Selection and ordering data

ET 200eco PN fail-safe digital input/output modules	
• 8 F-DI 24 V DC/3 F-DQ 24 V DC/2 A; PROFIsafe, certified up to SIL 3 (IEC 61508), PL e (ISO 13849); 4 x M12/3 x M12, degree of protection IP65/67	**6ES7146-6FF00-0AB0**
• 4 F-DI 24 V DC + 2 F-DQ 24 V DC/2 A PM + 4 DIQ 24 V DC + 1 CM IO-Link; PROFIsafe, certified up to SIL 3 (IEC 61508), PL e (ISO 13849); M12-L; incl. eCoding connector	**6ES7146-6FF00-0BB0**
Accessories	
• PD 24VDC power distributor; 1 x 7/8", 4 x M12	**6ES7148-6CB00-0AA0**
• Terminal block for ET 200eco PN, 10 A insulation displacement terminals	**6ES7194-6CA00-0AA0**
• Spare fuses for terminal block, 10 units	**6ES7194-6HB00-0AA0**
• Mounting rail 0.5 m	**6ES7194-6GA00-0AA0**
• Profile screw for mounting rail, 50 units	**6ES7194-6MA00-0AA0**
• Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units	**3RX9802-0AA00**
• Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units	**3RK1901-1KA00**
• Labels 10 mm x 7 mm yellow, for I/O devices with 2x M12 A-coded power connectors; 17 frames with 48 labels each	**6ES7194-6HA00-0AA0**
PROFINET M12 connection plug, for user assembly	
Connector for PROFINET, 4-core, shielded	**3RK1902-2DA00**
IE M12 plug PRO connector	
• 1 unit	**6GK1901-0DB10-6AA0**
• 8 units	**6GK1901-0DB10-6AA8**
IE FC M12 plug PRO connector, for user assembly	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
M12 connection plug for 24 V DC load power supply	
Connection socket for 24 V DC infeed; 4-pin, A-coded, 3 units	**6GK1907-0DC10-6AA3**
Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units	**6GK1907-0DB10-6AA3**
M12 circular connector	
Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A	
• Straight	**3RK1902-4BA00-5AA0**
• Angled	**3RK1902-4DA00-5AA0**
M12 coupling socket	**3RK1902-4CA00-4AA0**
4-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A, angled	
PROFINET bus cable	
Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded	
• 3 m	**3RK1902-2HB30**
• 5 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
M12-90/M12-90 IE connecting cable	
Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet	
Length:	
• 0.3 m	**6XV1870-8GE30**

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Selection and ordering data (continued)

• 0.5 m	**6XV1870-8GE50**
• 1.0 m	**6XV1870-8GH10**
• 1.5 m	**6XV1870-8GH15**
• 2.0 m	**6XV1870-8GH20**
• 3.0 m	**6XV1870-8GH30**
• 5.0 m	**6XV1870-8GH50**
• 10 m	**6XV1870-8GN10**
• 15 m	**6XV1870-8GN15**
M12-180/IE FC RJ45 plug-145 IE connecting cable Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67 Length:	
• 2.0 m	**6XV1871-5TH20**
• 3.0 m	**6XV1871-5TH30**
• 5.0 m	**6XV1871-5TH50**
• 10 m	**6XV1871-5TN10**
• 15 m	**6XV1871-5TN15**
M12-180/M12-180 IE robust connecting cable Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length:	
• 1.0 m	**6XV1881-5AH10**
• 2.0 m	**6XV1881-5AH20**
• 3.0 m	**6XV1881-5AH30**
• 5.0 m	**6XV1881-5AH50**
M12 Y-cable	
For connection of single-channel sensors (1oo1 evaluation), 5-pin	**6ES7194-6KB00-0XA0**
For joint connection of an F-DQ and an F-DI channel by means of an 8-pin M12 socket	**6ES7194-6KC00-0XA0**
E-coding plug (metal) for fail-safe ET 200 distributed I/O, IP65/IP67	**6ES7194-6KB01-0AA0**
Control line Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	
• 1.5 m	**3RK1902-4HB15-5AA0**
• 5 m	**3RK1902-4HB50-5AA0**
• 10 m	**3RK1902-4HC01-5AA0**
Preassembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	**3RK1902-4PB15-3AA0**
IO-Link connecting cables Between IO-Link master and reader, on both sides with M12 plug, 4-pin	
• 5 m	**6GT2891-4MH50**
• 10 m	**6GT2891-4MN10**
M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length:	
• 0.3 m	**6XV1801-5GE30**
• 0.5 m	**6XV1801-5GE50**
• 1.0 m	**6XV1801-5GH10**

Selection and ordering data (continued)

• 1.5 m	**6XV1801-5GH15**
• 2.0 m	**6XV1801-5GH20**
• 3.0 m	**6XV1801-5GH30**
• 5.0 m	**6XV1801-5GH50**
• 10 m	**6XV1801-5GN10**
• 15 m	**6XV1801-5GN15**
M12-180/M12-180 M12 robust power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length:	
• 1.0 m	**6XV1801-5AH10**
• 2.0 m	**6XV1801-5AH20**
• 3.0 m	**6XV1801-5AH30**
• 5.0 m	**6XV1801-5AH50**

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Technical specifications

Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A	6ES7146-6FF00-0BB0 ET 200eco PN, F-DI+F-DQ+DIQ+IOL, M12-L
General information		
Product function		
• Isochronous mode	No	No
• IRT	No; module will participate within an IRT topology	No; module will participate within an IRT topology
• Fast startup	No	No
• Prioritized startup	No	No
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V15 with HSP 204	STEP 7 V20 or higher with HSP0468
• PROFINET from GSD version/GSD revision	GSDML V2.34	GSDML V2.43 2025.05
Operating mode		
• DI	Yes	Yes
• Counter		No
• DQ	Yes	Yes
• MSI		No
• MSO		No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes; against destruction
Input current		
Current consumption (rated value)		100 mA 1L+ without load; 45 mA 2L+ without load
Current consumption, typ.	200 mA	
from supply voltage 1L+, max.	4 A	
from load voltage 1L+ (unswitched voltage)		12 A; Maximum value
from load voltage 2L+, max.	4 A	12 A; Maximum value
Encoder supply		
Number of outputs	2; Vs	6; Us0, Us1, Vs0 - Vs3
Actuator supply		
Number of outputs		3; Us2 - Us4
Digital inputs		
Number of digital inputs	8; 8 (one-channel); 4 (two-channel)	4 single-channel F-DI (SIL2) parameterizable as 2 two-channel (SIL3); 4 parameterizable as DIQ
Digital inputs, parameterizable	Yes	Yes
Sourcing/sinking input		P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes; F-DI
Input characteristic curve in accordance with IEC 61131, type 3		Yes; DIQ
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 60 °C, max.	8	8
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 V DC to +5 V DC	-3 to +5V
• for signal "1"	15 V DC to 30 V DC	+15 to +30 V F-DI; +11 to +30 V DIQ
Input current		
• for signal "1", typ.		3 to 6 mA F-DI; 2.5 mA DIQ
Input delay (for rated value of input voltage)		
- for standard inputs		

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Technical specifications (continued)

Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A	6ES7146-6FF00-0BB0 ET 200eco PN, F-DI+F-DQ+DIQ+IOL, M12-L
- Parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms F-DI; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms DIQ
Digital outputs		
Number of digital outputs	3	7; 2 F-DQ; 1 parameterizable F-DQ or IO-LINK Class B (with or without safety-shutdown); 4 parameterizable as DIQ
• in groups of	3	3 F-DQ (2L+); 4 DIQ (1L+)
Short-circuit protection	Yes; Electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	PM-switching: Typ. -26 V to (-48 V)	Typ. -74 V (typ. -26 V P-switch; typ. +48 V M-switch) F-DQ; Typ. 1L+ (-70 V) DIQ
Controlling a digital input	No	No F-DQ; Yes DIQ
Switching capacity of the outputs		
• with resistive load, max.		2 A F-DQ; 0.5 A DIQ
• with inductive load, max.		2 A F-DQ; 0.5 A DIQ
• on lamp load, max.	10 W	10 W F-DQ; 5 W DIQ
Load resistance range		
• lower limit		12 Ohm F-DQ; 48 Ohm DIQ
• upper limit		2 kOhm F-DQ; 4 kOhm DIQ
Output voltage		
• for signal "1", min.		2L+ (-2 V) F-DQ (2L+ (-1.5 V) P-switch; 0.5 V M-switch); 1L+ (-0.8 V) DIQ
Output current		
• for signal "1" rated value	2 A	2 A F-DQ; 0.5 A DIQ
• for signal "0" residual current, max.	0.5 mA	0.5 mA F-DQ; 0.1 mA DIQ
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	No	No F-DQ; Yes DIQ
Switching frequency		
• with resistive load, max.	30 Hz	30 Hz F-DQ; 100 Hz DIQ
• with inductive load, max.	0.1 Hz	0.1 Hz F-DQ; 0.5 Hz DIQ
• on lamp load, max.	10 Hz	30 Hz F-DQ; 100 Hz DIQ
Total current of the outputs (per group)		
- all mounting positions		
- up to 60 °C, max.	3.9 A	
Encoder		
Connectable encoders		
• 2-wire sensor	No	No F-DI; Yes DIQ
- permissible quiescent current (2-wire sensor), max.	0.5 mA	0.5 mA F-DI; 1.5 mA DIQ
IO-Link		
Number of ports		1
IO-Link protocol 1.0		Yes
IO-Link protocol 1.1		Yes
Transmission rate		4.8 kBd (COM1); 38.4 kBd (COM2)
Cycle time, min.		2 ms
Size of process data, input per port		33 byte
Size of process data, input per module		33 byte
Size of process data, output per port		32 byte
Size of process data, output per module		32 byte
Memory size for device parameter		2 kbyte
Master backup		Possible with function block IO_LINK_MASTER
Configuration without S7-PCT		Possible; autostart/manual function
Cable length unshielded, max.		20 m
Connection of IO-Link devices		
• Port type A		Yes; via 3-core cable

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Technical specifications (continued)

Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A	6ES7146-6FF00-0BB0 ET 200eco PN, F-DI+F-DQ+DIQ+IOL, M12-L
• Port type B		Yes; additional device supply: max. 2 A; also available with integrated Safety Shutdown via F-DQ 2
Interfaces		
Transmission procedure	100BASE-TX	
Number of PROFINET interfaces	1	1
1. Interface		
Interface type		PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types		
• M12 port	Yes	Yes; 2x M12, 4-pin, D-coded
• Number of ports		2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO device	Yes	Yes
• Open IE communication	No	Yes
PROFINET IO Device		
- Services		
- IRT	No; module will participate within an IRT topology	No; module will participate within an IRT topology
- Prioritized startup	No	No
- Shared device	No	Yes
- Number of IO Controllers with shared device, max.		2
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	
PROFIsafe	Yes	Yes
EtherNet/IP	No	No
Modbus TCP	No	No
Redundancy mode		
• PROFINET system redundancy (S2)	Yes	Yes
• PROFINET system redundancy (R1)	No	No
• H-Sync forwarding	No	No
- Media redundancy		
- MRP	Yes	Yes
- MRPD	No	
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/status information		
Diagnostics function	Yes	
Substitute values connectable		Yes
Alarms		
• Diagnostic alarm	Yes	Yes; Parameterizable
• Maintenance interrupt		Yes; Parameterizable
• Hardware interrupt		Yes; Parameterizable

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Technical specifications (continued)

Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A	6ES7146-6FF00-0BB0 ET 200eco PN, F-DI+F-DQ+DIQ+IOL, M12-L
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; green "ON" LED	Yes
- Parameterizable		Yes
• Wire break		Yes; DI, input current < 0.3 mA, per channel
• Wire-break in actuator cable	Yes	Yes
• Wire-break in signal transmitter cable	Yes	
• short-circuit	Yes	Yes; F-DI, F-DQ, DIQ as output, encoder supply
• Short-circuit encoder supply	Yes	
• Group error	Yes; Red/yellow "SF/MT" LED	
Diagnostics indication LED		
• RUN LED		Yes; green LED
• ERROR LED		Yes; red LED
• MAINT LED		Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)		Yes; green LED
• NS LED		No
• MS LED		No
• IO LED		Yes; red/green/yellow LEDs
• Channel status display		Yes; green LED
• for channel diagnostics		Yes; red LED
• For load voltage monitoring		Yes; green LED
• Connection display LINK TX/RX		Yes; green LED, only link
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	Yes
• between the channels and the power supply of the electronics		4 F-DI / 4 DIQ / 1 IO-LINK are non-isolated and 3 F-DQ are isolated from supply voltage 1L+
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67/69K
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	No	No
Use in hazardous areas		
• Explosion protection category for gas		ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust		ATEX, UKEX, IECEx, CCCEx for Zone 22
Security		
signed firmware update		Yes
safely removing data		Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude		Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs		M12, 5-pin, A-coded
Design of electrical connection for supply voltage		M12, 4-pin, L-coded
Dimensions		
Width	60 mm	45 mm

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Technical specifications (continued)

Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A	6ES7146-6FF00-0BB0 ET 200eco PN, F-DI+F-DQ+DIQ+IOL, M12-L
Height	175 mm	200 mm
Depth	49 mm	48 mm
Weights		
Weight, approx.	940 g	900 g

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Overview



IO-Link master with 2x M12 L-coded power connectors and 45 mm width

- IO-Link communication modules for connecting up to 8 IO-Link devices
- Options: IO-Link master
  - with 4x Class A port and 4x Class B port as well as additional 4 digital inputs,
  - with 4x Port Class A and additional 12 digital inputs/outputs or
  - with 8x Port Class A and additional 8 digital inputs/outputs.
- The IO-Link specifications V1.0 and V1.1 are supported



IO-Link master with 2x M12 A-coded power connectors and 30 mm width

- IO-Link communication modules for connecting up to 4 IO-Link devices
- IO-Link master with 4x Class B port
- The IO-Link specifications V1.0 and V1.1 are supported

Overview (continued)



IO-Link master with 2x M12 A-coded power connectors and 60 mm width

- IO-Link communication modules for connecting up to 4 IO-Link devices
- IO-Link master with 4x Class A port and additional 8 digital inputs and 4 digital outputs
- The IO-Link specification V1.0 is supported

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Selection and ordering data

ET 200eco PN IO-Link master	
• 8 IO-L + 4 DI 24 V DC; 8 x M12, degree of protection IP67, enclosure width 45 mm; for connecting up to 8 IO-Link devices according to IO-Link specification V1.0 and V1.1, 4x Class A port and 4 x Class B port, as well as 4 additional digital inputs	**6ES7148-6JG00-0BB0**
• 8 IO-L + 8 DIQ 24 V DC; 8 x M12, degree of protection IP67, enclosure width 45 mm; for connecting up to 8 IO-Link devices according to IO-Link specification V1.0 and V1.1, 8x Class A ports, as well as 8 additional digital inputs/outputs	**6ES7148-6JJ00-0BB0**
• 4 IO-L + 12 DIQ 24 V DC; 8 x M12, degree of protection IP67, enclosure width 45 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1, 4x Class A ports, as well as 12 additional digital inputs/outputs	**6ES7148-6JE00-0BB0**
Accessories	
• PD 24VDC power distributor; 1 x 7/8", 4 x M12	**6ES7148-6CB00-0AA0**
• Terminal block for ET 200eco PN, 10 A insulation displacement terminals	**6ES7194-6CA00-0AA0**
• Spare fuses for terminal block, 10 units	**6ES7194-6HB00-0AA0**
• Mounting rail 0.5 m	**6ES7194-6GA00-0AA0**
• Profile screw for mounting rail, 50 units	**6ES7194-6MA00-0AA0**
• Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units	**3RX9802-0AA00**
• Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units	**3RK1901-1KA00**
• Labels 10 mm x 5 mm RAL9016, for I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**
• Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each	**3RT2900-1SB10**
PROFINET M12 connection plug, for user assembly	
Connector for PROFINET, 4-core, shielded	**3RK1902-2DA00**
IE M12 plug PRO connector	
• 1 unit	**6GK1901-0DB10-6AA0**
• 8 units	**6GK1901-0DB10-6AA8**
IE FC M12 plug PRO connector, for user assembly	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
M12 connection plug for 24 V DC load power supply	
Connection socket for 24 V DC infeed; 4-pin, A-coded, 3 units	**6GK1907-0DC10-6AA3**
Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units	**6GK1907-0DB10-6AA3**
M12 circular connector	
Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A	
• Straight	**3RK1902-4BA00-5AA0**
• Angled	**3RK1902-4DA00-5AA0**
M12 coupling socket	**3RK1902-4CA00-4AA0**
4-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A, angled	
PROFINET bus cable	
Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded	
• 3 m	**3RK1902-2HB30**
• 5 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
M12-90/M12-90 IE connecting cable	
Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet	
Length:	
• 0.3 m	**6XV1870-8GE30**
• 0.5 m	**6XV1870-8GE50**
• 1.0 m	**6XV1870-8GH10**
• 1.5 m	**6XV1870-8GH15**
• 2.0 m	**6XV1870-8GH20**
• 3.0 m	**6XV1870-8GH30**
• 5.0 m	**6XV1870-8GH50**
• 10 m	**6XV1870-8GN10**
• 15 m	**6XV1870-8GN15**
M12-180/IE FC RJ45 plug-145 IE connecting cable	
Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67	
Length:	
• 2.0 m	**6XV1871-5TH20**
• 3.0 m	**6XV1871-5TH30**
• 5.0 m	**6XV1871-5TH50**
• 10 m	**6XV1871-5TN10**
• 15 m	**6XV1871-5TN15**
M12-180/M12-180 IE robust connecting cable	
Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69	
Length:	
• 1.0 m	**6XV1881-5AH10**
• 2.0 m	**6XV1881-5AH20**
• 3.0 m	**6XV1881-5AH30**
• 5.0 m	**6XV1881-5AH50**
M12 Y-cable	
For double connection of I/O by means of a single cable to ET 200, 5-pin	**6ES7194-6KA00-0XA0**
Control line	
Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	
• 1.5 m	**3RK1902-4HB15-5AA0**
• 5 m	**3RK1902-4HB50-5AA0**
• 10 m	**3RK1902-4HC01-5AA0**
Preassembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	**3RK1902-4PB15-3AA0**
IO-Link connecting cables	
Between IO-Link master and reader, on both sides with M12 plug, 4-pin	
• 5 m	**6GT2891-4MH50**
• 10 m	**6GT2891-4MN10**

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Selection and ordering data (continued)

Energy cable 4 x 1.5 Trailable power cable, with 4 copper cores (1.5 mm^2) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1801-2B**
M12-90/M12-90 **M12 power connecting cable** Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length:	
• 0.3 m	**6XV1801-5GE30**
• 0.5 m	**6XV1801-5GE50**
• 1.0 m	**6XV1801-5GH10**
• 1.5 m	**6XV1801-5GH15**
• 2.0 m	**6XV1801-5GH20**
• 3.0 m	**6XV1801-5GH30**
• 5.0 m	**6XV1801-5GH50**
• 10 m	**6XV1801-5GN10**
• 15 m	**6XV1801-5GN15**
M12-180/M12-180 **M12 power connecting cable** Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length:	
• 0.5 m	**6XV1801-6DE50**
• 1.0 m	**6XV1801-6DH10**
• 1.5 m	**6XV1801-6DH15**
• 2.0 m	**6XV1801-6DH20**
• 3.0 m	**6XV1801-6DH30**
• 5.0 m	**6XV1801-6DH50**
• 10 m	**6XV1801-6DN10**
• 15 m	**6XV1801-6DN15**
M12-90/M12-90 **M12 power connecting cable** Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length:	
• 0.5 m	**6XV1801-6GE50**
• 1.0 m	**6XV1801-6GH10**
• 1.5 m	**6XV1801-6GH15**
• 2.0 m	**6XV1801-6GH20**
• 3.0 m	**6XV1801-6GH30**
• 5.0 m	**6XV1801-6GH50**
• 10 m	**6XV1801-6GN10**
• 15 m	**6XV1801-6GN10**
M12-180/M12-180 **M12 robust power connecting cable** Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length:	
• 1.0 m	**6XV1801-5AH10**

Selection and ordering data (continued)

• 2.0 m	**6XV1801-5AH20**
• 3.0 m	**6XV1801-5AH30**
• 5.0 m	**6XV1801-5AH50**
Power M12 plug PRO Connector for 24 V DC supply voltage, with installation instructions, 4-pin, L-coded, 1 unit	**6GK1906-0EA00**
Power M12 cable connector PRO Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit	**6GK1906-0EB00**

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Technical specifications

Article number	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0363
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	No
• MSI	No
• MSO	No
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value)	70 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Digital inputs	
Number of digital inputs	4
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
- all mounting positions	
- up to 60 °C, max.	4
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.5 mA
IO-Link	
Number of ports	8
• of which simultaneously controllable	8
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms
Size of process data, input per port	33 byte
Size of process data, input per module	264 byte
Size of process data, output per port	32 byte
Size of process data, output per module	256 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	possible with LIOLink_Master function block
Configuration without S7-PCT	Possible; autostart/manual function

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Technical specifications (continued)

Article number	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; additional device supply: max. 2 A per port, max. 6 A per module
• via three-wire connection	Yes
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	No
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Redundancy mode	

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Technical specifications (continued)

Article number	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
- DLR (Device Level Ring)	No
- Address area	
- Address space per module, max.	300 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	300 byte
- Access-consistent address space	2 byte
- Updating time	
- I/O request interval	2 ms
- Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- Parameterizable	Yes
• Wire break	Yes
• Short-circuit encoder supply	Yes; Per channel
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• For load voltage monitoring	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	No

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Technical specifications (continued)

Article number	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Use in hazardous areas	
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22
Security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions, see manual for details
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	
Weight, approx.	780 g

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
General information		
Product function		
• Isochronous mode	No	No
• IRT	Yes	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0378	STEP 7 V17 or higher with HSP 0378
• PROFINET from GSD version/GSD revision	GSDML V2.4.x	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.4.1 or higher	V1.4.1 or higher
Operating mode		
• IO-Link	Yes	Yes
• DI	Yes	Yes
• DQ	Yes	Yes
• MSI	Yes	Yes
• MSO	Yes	Yes
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Load voltage 2L+		
• Rated value (DC)	24 V	24 V

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Technical specifications (continued)

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
Current consumption (rated value)	70 mA; without load	70 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value	12 A; Maximum value
Encoder supply		
Number of outputs	8	4
Digital inputs		
Number of digital inputs	8; Parameterizable as DIQ	12; Parameterizable as DIQ
• in groups of	8	4
Digital inputs, parameterizable	Yes	Yes
Sourcing/sinking input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
- all mounting positions		
- up to 60 °C, max.	8	12
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.5 mA	2.5 mA
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs		
Number of digital outputs	8; Parameterizable as DIQ	12; Parameterizable as DIQ
• in groups of	8	2 load groups for 4 or 8 outputs each
Current-sourcing	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes	Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	0.5 A: typ. 1L+ (-70 V)	0.5 A: Type 1L+ (-70 V) / 2 A: Type (-18 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A / 2 A
• with inductive load, max.	0.5 A	0.5 A / 2 A
• on lamp load, max.	5 W	0.5 A: 5 W / 2 A 10 W
Load resistance range		
• lower limit	48 Ω	0.5 A: 48 ohms / 2 A: 12 ohms
• upper limit	4 kΩ	4 kΩ
Output voltage		
• for signal "1", min.	1L+ (-0.8V)	1L+ (-0.8 V) / 2L+ (-0.8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A / 2 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	0.5 A: 100 Hz / 2 A: 40 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
Total current of the outputs		
• Current per group, max.	1L+: 4 A	1L+: 2 A / 2L+: 5.5 A
• Current per module, max.	4 A	7.5 A

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Technical specifications (continued)

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
IO-Link		
Number of ports	8	4
• of which simultaneously controllable	8	4
IO-Link protocol 1.0	Yes	Yes
IO-Link protocol 1.1	Yes	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms	2 ms
Size of process data, input per port	33 byte	33 byte
Size of process data, input per module	264 byte	132 byte
Size of process data, output per port	32 byte	32 byte
Size of process data, output per module	256 byte	128 byte
Memory size for device parameter	2 kbyte; for each port	2 kbyte; for each port
Master backup	possible with LIOLink_Master function block	possible with LIOLink_Master function block
Configuration without S7-PCT	Possible; autostart/manual function	Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m
Operating modes		
• IO-Link	Yes	Yes
• DI	Yes	Yes
• DQ	Yes; max. 100 mA	Yes; max. 100 mA
Connection of IO-Link devices		
• Port type A	Yes; via 3-core cable	Yes; via 3-core cable
• Port type B	No	No
• via three-wire connection	Yes	Yes
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types		
• M12 port	Yes; 2x M12, 4-pin, D-coded	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO Device	Yes	Yes
• Open IE communication	Yes	Yes
PROFINET IO Device		
- Services		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	No	No
EtherNet/IP	Yes	Yes

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Technical specifications (continued)

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
Modbus TCP	Yes	Yes
Redundancy mode		
• PROFINET system redundancy (S2)	Yes	Yes
• PROFINET system redundancy (R1)	No	No
• H-Sync forwarding	Yes	Yes
- Media redundancy		
- MRP	Yes	Yes
- MRPD	No	No
EtherNet/IP		
- Services		
- CIP Implicit Messaging	Yes	Yes
- CIP Explicit Messaging	Yes	Yes
- CIP Safety	No	No
- Shared device	Yes; 2x EtherNet/IP Scanner	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2	2
- Updating times		
- Requested Packet Interval (RPI)	2 ms	2 ms
- Redundancy mode		
- DLR (Device Level Ring)	No	No
- Address area		
- Address space per module, max.	300 byte	300 byte
- LargeForwardOpen (Class3)	No	No
Modbus TCP		
- Services		
- read coils (code=1)	Yes	Yes
- read discrete inputs (code=2)	Yes	Yes
- Read Holding Registers (Code=3)	Yes	Yes
- write single coil (code=5)	Yes	Yes
- write multiple coils (code=15)	Yes	Yes
- Write Multiple Registers (Code=16)	Yes	Yes
- Parameter change by master	No	No
- Modbus TCP Security Protocol	No	No
- Address space per station		
- Address space per station, max.	300 byte	300 byte
- Access-consistent address space	2 byte	2 byte
- Updating time		
- I/O request interval	2 ms	2 ms
- Connections		
- number of connections per device	12	12
Open IE communication		
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/status information		
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- Parameterizable	Yes	Yes
• Wire break	Yes; DI, input current < 0.3 mA, per channel	Yes; DI, input current < 0.3 mA, per channel

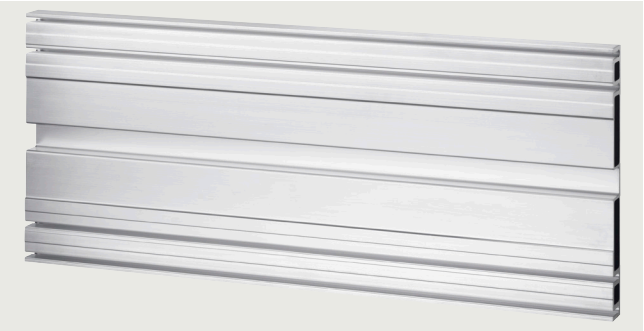
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Technical specifications (continued)

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
• Short-circuit encoder supply	Yes; Per channel	Yes; Per channel
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)		Yes; green LED
• NS LED	Yes; green/red LED	Yes; green/red LED
• MS LED	Yes; green/red LED	Yes; green/red LED
• IO LED	Yes; red-green-yellow LED	Yes; red-green-yellow LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link	Yes; green LED, only link
Potential separation		
between the load voltages	Yes	Yes
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	Yes
• between the channels and the power supply of the electronics		8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection		
IP degree of protection	IP65/67/69K	IP65/67/69K
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; from FS01	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Use in hazardous areas		
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22	ATEX, UKEX, IECEx, CCCEx for Zone 22
Security		
signed firmware update	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded	M12, 4-pin, L-coded
Dimensions		
Width	45 mm	45 mm
Height	200 mm	200 mm
Depth	48 mm	48 mm
Weights		
Weight, approx.	780 g	780 g

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Overview



- Aluminum mounting rail for installation of SIMATIC ET 200eco PN
- Securing the I/O devices via two profile screws
- Length of mounting rail 0.5 m

Selection and ordering data

Mounting rail for ET 200eco PN Length 0.5 m	**6ES7194-6GA00-0AA0**
Profile screw for mounting rail For fixing the I/O devices on the mounting rail; 50 units	**6ES7194-6MA00-0AA0**

Technical specifications

Article number	**6ES7194-6GA00-0AA0** **Mounting BAR for ET200eco PN**
Dimensions	
Width	500 mm
Height	203 mm
Depth	20 mm
Weights	
Weight, approx.	2.06 kg

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Overview

- Labels for channel and device labeling of the ET 200eco PN components

Selection and ordering data

Labels 10 x 5 mm RAL9016 For I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**
Labels 10 x 7 mm yellow For I/O devices with 2x M12 A-coded power connectors; 17 frames with 48 labels each	**6ES7194-6HA00-0AA0**

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Overview



- Stainless steel connector cover for ET 200ecoPN M12-L
- Optional use in hazardous area zone 2 / 22
- Can be used as protection against shocks and unintentional disconnection of cables

Selection and ordering data

Stainless steel connector cover, For using ET 200eco PN M12-L in hazardous area zone 2 / 22	**6ES7194-6JA00-0BB0**

Technical specifications

Article number	6ES7194-6JA00-0BB0 Connector cover for ET200ecoPN M12-L
General information	
Product type designation	connector cover
Product description	connector cover for ET200ecoPN M12-L
Suitability for use	accessories for use of the ET200ecoPN M12-L in hazardous area Zone 2/22
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during assembly, min.	-40 °C
Ambient temperature during assembly, max.	80 °C
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Mechanics/material	
Material of housing	stainless steel with plastic edge protection
Material property	
• Silicone-free	Yes
Dimensions	
Width	50 mm
Height	200 mm
Depth	110 mm
Weights	
Weight, approx.	710 g

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Overview



- Compact I/O devices in hygienic design for processing digital and IO-Link signals
- For connection to bus systems with Ethernet-based protocols PROFINET, EtherNet/IP, and Modbus TCP
- Very robust and chemically resistant plastic enclosure in hygienic design
- Cabinet-free installation in degree of protection IP65/67/69K with M12 connection method
- Trapezoidal enclosure shape of the I/O devices:
  60/80 mm x 204 mm x 54 mm (W x H x D) with 8 x M12 for digital signals and IO-Link
- Range of ambient temperature -30 °C to 55 °C
- Operation on high-availability S7-1500 R/H or S7-400H controllers possible
- Channel-specific diagnostics
- Identification and maintenance data
- Firmware update
- Security functions
- QR code identification link (ID-Link) for unambiguous identification of the product
- I/O device variants:
  - DI 16x 24 V DC, 8x M12
  - DIQ 16x 24 V DC/0.5 A, 8x M12
  - CM 8x IO-Link + DIQ 4x 24 V DC, 8x M12

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Overview



Digital I/O devices in hygienic design for connecting sensors/actuators:

- 16 digital input signals with 8 x M12 connection
- 16 digital input/output signals 0.5 A with 8 x M12 connection

Selection and ordering data

Digital input modules	
SIMATIC ET 200clean, DI 16x24 V DC 8x M12, dual assignment, input type 3 (IEC 61131), sinking input (PNP), input delay 0.05..20 ms, channel diagnostics for: wire break at the input, short-circuit encoder supply, 0.25 ms isochronous mode, MSI, MRP, S2 redundancy, I&M0...4, MultiFieldbus, PN IO, Ethernet IP, Modbus TCP, degree of protection IP69K	**6ES7141-7BH00-0BB0**
Digital input/output modules	
SIMATIC ET 200clean, DIQ 16x 24 V DC/0.5 A 8x M12, dual assignment, input type 3 (IEC 61131), sinking input (PNP), input delay 0.05..20 ms, sourcing output (PNP), substitute value output, channel diagnostics for: wire break at the input, short-circuit encoder supply, short-circuit at the output, MSI, MSO, MRP, S2 redundancy, I&M0...4, MultiFieldbus, PN IO, Ethernet IP, Modbus TCP, degree of protection IP69K	**6ES7143-7BH00-0BB0**

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Technical specifications

Article number	6ES7141-7BH00-0BB0 ET 200clean, DI 16x24VDC
General information	
Product function	
• Isochronous mode	Yes
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 or higher with HSP 0414
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5.x or higher
Operating mode	
• DI	Yes
• Counter	No
• MSI	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value)	85 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
- all mounting positions	
- up to 55 °C, max.	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.4 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes

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Technical specifications (continued)

Article number	6ES7141-7BH00-0BB0 ET 200clean, DI 16x24VDC
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	No
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Redundancy mode	
- DLR (Device Level Ring)	No
- Address area	
- Address space per module, max.	20 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	20 byte
- Access-consistent address space	2 byte
- Updating time	
- I/O request interval	2 ms
- Connections	
- number of connections per device	12
Open IE communication	

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Technical specifications (continued)

Article number	6ES7141-7BH00-0BB0 ET 200clean, DI 16x24VDC
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Isochronous mode	
Equidistance	Yes
shortest clock pulse	250 µs
max. cycle	4 ms
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- Parameterizable	Yes
• Wire break	Yes; DI, input current < 0.3 mA, per channel
• Short-circuit encoder supply	Yes; Per channel group
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors

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Technical specifications (continued)

Article number	6ES7141-7BH00-0BB0 ET 200clean, DI 16x24VDC
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Mechanics/material	
Material	housing: PBT; seal: MVQ (silicone); bushing / metal parts: 1.4404 (stainless steel)
Dimensions	
Width	80 mm
Height	205 mm
Depth	54 mm
Weights	
Weight, approx.	260 g

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 or higher with HSP 0414
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5.x or higher
Operating mode	
• DI	Yes
• Counter	No
• DQ	Yes
• MSI	Yes
• MSO	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Input current	
Current consumption (rated value)	95 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Digital inputs	
Number of digital inputs	16; Parameterizable as DIQ
• in groups of	8
Digital inputs, parameterizable	Yes
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
- all mounting positions	
- up to 55 °C, max.	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V

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Technical specifications (continued)

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.4 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Number of digital outputs	16; Parameterizable as DIQ
• in groups of	8; 2 load groups for 8 outputs each
Current-sourcing	Yes
output type acc. to IEC 61131, type 0.5	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	typ. L+ (-70 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• with inductive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	1L+ (-0.8 V) / 2L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per group, max.	4 A
• Current per module, max.	8 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes

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Technical specifications (continued)

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	No
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Redundancy mode	
- DLR (Device Level Ring)	No
- Address area	
- Address space per module, max.	20 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	20 byte
- Access-consistent address space	2 byte
- Updating time	
- I/O request interval	2 ms
- Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes

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Technical specifications (continued)

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- Parameterizable	Yes
• Wire break	Yes; DI, input current < 0.3 mA, per channel
• short-circuit	Yes; Outputs to M and P; channel by channel
• Short-circuit encoder supply	Yes; Per channel group
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• For load voltage monitoring	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	Yes
• between the channels, in groups of	8
• between the channels and the power supply of the electronics	8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded

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Technical specifications (continued)

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
Mechanics/material	
Material	housing: PBT; seal: MVQ (silicone); bushing / metal parts: 1.4404 (stainless steel)
Dimensions	
Width	80 mm
Height	205 mm
Depth	54 mm
Weights	
Weight, approx.	260 g

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Overview



IO-Link master in hygienic design for connecting sensors/actuators:

- 4x port Class A and 4x port Class B, as well as additionally 4 digital input/output signals 0.5 A with 8xM12 connection

Selection and ordering data

SIMATIC ET 200clean, CM 8x IO-Link + DIQ 4x 24 V DC 8x M12, 4x port Class A + 4x port Class B, channel diagnostics, shared device with 2 controllers, MRP, S2 redundancy, I&M0...4, MultiFieldbus, PN IO, Ethernet IP, Modbus TCP, degree of protection IP69K	**6ES7148-7JH00-0BB0**

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Technical specifications

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 or higher with HSP 0414
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5.x
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	Yes
• MSI	Yes
• MSO	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value)	100 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Actuator supply	
Number of outputs	4
Digital inputs	
Number of digital inputs	4; Parameterizable as DIQ
Digital inputs, parameterizable	Yes
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
- all mounting positions	
- up to 55 °C, max.	4
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.4 mA
Input delay (for rated value of input voltage)	
- for standard inputs	
- Parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Number of digital outputs	4; Parameterizable as DIQ
output type acc. to IEC 61131, type 0.5	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	typ. 1L+ (-70 V)
Controlling a digital input	Yes
Switching capacity of the outputs	

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Technical specifications (continued)

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
• with resistive load, max.	0.5 A
• with inductive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	1L+ (-0.8V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per group, max.	1L+: 2 A
• Current per module, max.	2 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
IO-Link	
Number of ports	8
• of which simultaneously controllable	8
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms
Size of process data, input per port	33 byte
Size of process data, input per module	264 byte
Size of process data, output per port	32 byte
Size of process data, output per module	256 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	possible with LIOLink_Master function block
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; additional device supply: max. 2 A per port, max. 6 A per module
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes

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Technical specifications (continued)

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
Protocols	
• PROFINET IO device	Yes
• Open IE communication	Yes
PROFINET IO Device	
- Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	No
EtherNet/IP	
- Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
- Updating times	
- Requested Packet Interval (RPI)	2 ms
- Redundancy mode	
- DLR (Device Level Ring)	No
- Address area	
- Address space per module, max.	300 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
- Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
- Address space per station	
- Address space per station, max.	300 byte
- Access-consistent address space	2 byte
- Updating time	
- I/O request interval	2 ms

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Technical specifications (continued)

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
- Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- Parameterizable	Yes
• Wire break	Yes; DI, input current < 0.3 mA, per channel
• short-circuit	Yes; Outputs to M and P; channel by channel
• Short-circuit encoder supply	Yes; Per channel
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• For load voltage monitoring	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions, see manual for details

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Technical specifications (continued)

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Mechanics/material	
Material	housing: PBT; seal: MVQ (silicone); bushing / metal parts: 1.4404 (stainless steel)
Dimensions	
Width	80 mm
Height	205 mm
Depth	54 mm
Weights	
Weight, approx.	280 g

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Overview

For use in systems with increased hygienic requirements, specific mounting accessories are available.

Material transitions and contact surfaces of the accessories are provided with a hygienic seal that prevents the accumulation of dirt, bacteria and other microorganisms when installed.

Sealing cap

Sealing cap M12 in hygienic design and with degree of protection IP69K, for sealing open M12 sockets of the ET 200clean I/O devices.

Fixing screw

Fixing screw M5x50mm as stainless steel version, for mounting the ET 200clean I/O devices on conductive surfaces.

Selection and ordering data

Sealing cap M12 for ET 200clean Plastic version, hygienic seal, for degree of protection IP69K, 10 units per packing unit	**6ES7194-7JA00-0AA0**
Fixing screw M5x50mm for ET 200clean Stainless steel version, hygienic seal, 10 units per packing unit	**6ES7194-7MA00-0AA0**

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Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slave (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 Kbps to 12 Mbps
- Connection via FastConnect using IDC

Selection and ordering data

RS 485 diagnostic repeater For connection of up to 2 segments to PROFIBUS DP; with online diagnostics functions for monitoring the bus cables	**6ES7972-0AB01-0XA0**
Accessories	
RS 485 bus connector with 90° cable outlet With screw-type connections, max. transfer rate 12 Mbps	
• Without PG interface	**6ES7972-0BA12-0XA0**
• With PG interface	**6ES7972-0BB12-0XA0**
PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet With insulation displacement terminals, max. transfer rate 12 Mbps Without PG interface	
• 1 unit	**6ES7972-0BA52-0XA0**
• 100 units	**6ES7972-0BA52-0XB0**
With PG interface	
• 1 unit	**6ES7972-0BB52-0XA0**
• 100 units	**6ES7972-0BB52-0XB0**
Without PG interface, grounding via control cabinet cover	
• 1 unit	**6ES7972-0BA70-0XA0**
With PG interface, grounding via control cabinet cover	
• 1 unit	**6ES7972-0BB70-0XA0**
RS 485 bus connector with angled cable outlet (35°) With screw-type connections, max. transfer rate 12 Mbps	
• Without PG interface	**6ES7972-0BA42-0XA0**
• With PG interface	**6ES7972-0BB42-0XA0**
PROFIBUS FastConnect RS 485 bus connector with angular cable outlet (35°) With insulation displacement terminals, max. transfer rate 12 Mbps	
• Without PG interface	**6ES7972-0BA61-0XA0**
• With PG interface	**6ES7972-0BB61-0XA0**
PROFIBUS FastConnect stripping tool Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	**6GK1905-6AA00**
PROFIBUS FC standard cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Article number	6ES7972-0AB01-0XA0 Diagnostic repeater f. PROFIBUS-DP,
Supply voltage	
Rated value (DC)	24 V
Power loss	
Power loss, typ.	4 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C
Connection method	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	FastConnect insulation displacement, 10 clamping cycles possible
Dimensions	
Width	80 mm
Height	125 mm
Depth	67.5 mm
Weights	
Weight, approx.	300 g

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Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slave (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 Kbps to 12 Mbps
- Connection via FastConnect using IDC

Note:
SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.
Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

Selection and ordering data

SIPLUS RS 485 diagnostic repeater	
For connection of up to 2 segments to PROFIBUS DP; with online diagnostics functions for monitoring the bus cables	
Exposure to environmental substances	**6AG1972-0AB01-4XA0**
Accessories	
RS 485 bus connector with 90° cable outlet	
Max. transfer rate 12 Mbps	
Extended temperature range and exposure to environmental substances	
• Without PG interface	**6AG1972-0BA12-2XA0**
• With PG interface	**6AG1972-0BB12-2XA0**
RS 485 bus connector with angled cable outlet	
(Extended temperature range -40 °C ... +70 °C and exposure to environmental substances)	
Max. transfer rate 12 Mbps	
• Without PG interface	**6AG1972-0BA42-7XA0**
• With PG interface	**6AG1972-0BB42-7XA0**
Other accessories	See SIMATIC RS 485 diagnostic repeater

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Technical specifications

Article number	6AG1972-0AB01-4XA0 SIPLUS Diagnose-Repeater fuer Profibus
Supply voltage	
Rated value (DC)	24 V
Power loss	
Power loss, typ.	4 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Connection method	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	FastConnect insulation displacement, 10 clamping cycles possible
Dimensions	
Width	80 mm
Height	125 mm

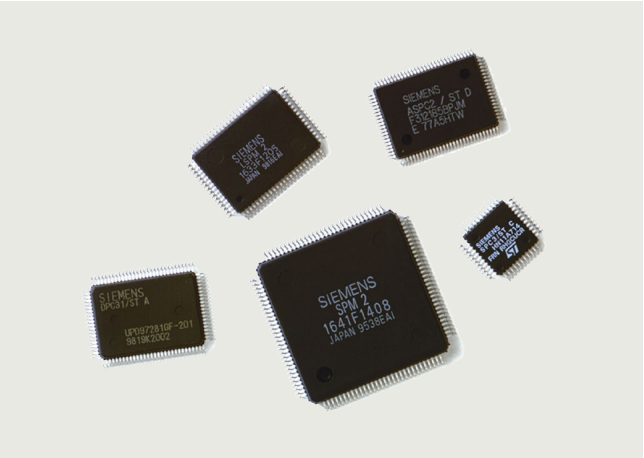
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Technical specifications (continued)

Article number	6AG1972-0AB01-4XA0 SIPLUS Diagnose-Repeater fuer Profibus
Depth	67.5 mm
Weights	
Weight, approx.	300 g

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Overview



- Easy connection of field devices to PROFIBUS
- Integrated low-power management
- Different ASICs for the different functional requirements and application areas

Selection and ordering data

ASIC ASPC2	
For constructing master interface modules (quantity discount)	
• 6 units (lead-free)	**6ES7195-0AA05-0XA0**
• 66 units (lead-free)	**6ES7195-0AA15-0XA0**
• 660 units (lead-free)	**6ES7195-0AA25-0XA0**
• 4620 units (lead-free)	**6ES7195-0AA35-0XA0**
ASIC SPC3	
For constructing intelligent DP slave interface modules (quantity discount)	
• 6 units (lead-free)	**6ES7195-0BD04-0XA0**
• 96 units (lead-free)	**6ES7195-0BD14-0XA0**
• 960 units (lead-free)	**6ES7195-0BD24-0XA0**
• 4800 units (lead-free)	**6ES7195-0BD34-0XA0**
• 750 units (lead-free) (tape & reel)	**6ES7195-0BD44-0XA0**
ASIC DPC31 STEP C1	
For constructing intelligent DP slave interface modules (quantity discount)	
• 6 units (lead-free)	**6ES7195-0BF02-0XA0**
• 66 units (lead-free)	**6ES7195-0BF12-0XA0**
• 660 units (lead-free)	**6ES7195-0BF22-0XA0**
• 4620 units (lead-free)	**6ES7195-0BF32-0XA0**
ASIC SPC 4-2	
For constructing intelligent DP slave interface modules (quantity discount)	
• 5 units for laboratory development (lead-free)	**6GK1588-3AA00**
• 160 units (lead-free, 1 tray)	**6GK1588-3AA15**

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Technical specifications

	LSPM2	SPC3	DPC31
Protocol	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP, PROFIBUS PA
Application range	Simple slave application	Intelligent slave application	Intelligent slave application
Transmission rate, max.	12 Mbps	12 Mbps	12 Mbps
Bus access	in ASIC	in ASIC	in ASIC
Automatic determination of transmission rate	Yes	Yes	Yes
Microprocessor required	No	Yes	integrated
Scope of firmware	not required	6 to 24 KB	Approx. 38 KB
Message buffer	-	1.5 KB	6 KB
Power supply	5 V DC	5 V DC	3.3 V DC
Power loss, max.	0.35 W	0.5 W	0.2 W
Permissible ambient temperature	-40 °C to +75 °C	-40 °C to +85 °C	-40 °C to +85 °C
Enclosure	MQFP, 80-pin	PQFP, 44-pin	PQFP, 100-pin
Frame size	4 cm^2	2 cm^2	4 cm^2
Delivery quantities (pcs.)	6/66/330/4950	6/96/750/960/4800	STEP B: 6/60/300/5100 STEP C1: 6/66/660/4620

	SPC 4-2	ASPC2	SIM 1-2
Protocol	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS PA
Application range	Intelligent slave application	Master application	Medium Attachment
Transfer rate, max.	12 Mbps	12 Mbps	31.25 Kbps
Bus access	in ASIC	in ASIC	-
Automatic determination of transfer rate	Yes	Yes	-
Microprocessor required	Yes	Yes	-
Scope of firmware	3 to 30 KB	80 KB	not required
Message buffer	3 KB	1 MB (external)	-
Power supply	5 V DC, 3.3 V	5 V DC	via bus
Power loss, max.	0.6 W at 5V 0.01 W at 3.3 V	0.9 W	0.05 W
Permissible ambient temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Enclosure	TQFP, 44-pin	P-MQFP, 100-pin	MLPQ, 40-pin
Frame size	2 cm^2	4 cm^2	36 mm^2
Delivery quantities (pcs.)	5/160	6/66/660/4620	30/60/1000

More information

Support

Please contact the following Competence Centers for any technical questions:

Germany and Europe

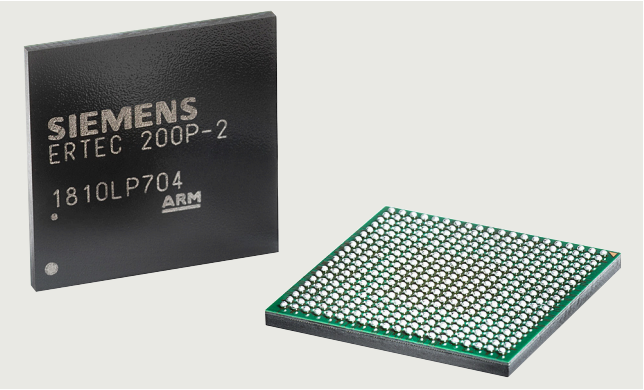
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USA and International

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Overview



Innovative and well-proven

As a dedicated PI member, Siemens has been actively advancing the development of PROFINET from the beginning. Siemens technology components benefit from the accumulated know-how. They have been field-proven in countless products, provide maximum performance capability and can be scaled to exact requirements.

And that is not all. Siemens Competence Centers offer advice for choosing the right technology component for the device, training opportunities and support throughout the development process, up to and including successful certification.

ERTEC 200P-2 – Your path to the fastest PROFINET

The ERTEC 200P-2 (Enhanced Real-Time Controller) sets new standards for communication.
Designed for cycle times as low as 125 µs, the performance upgrade for PROFINET has been integrated in the ERTEC 200P-2. With its 250 MHz ARM9 CPU and integrated IRT (isochronous real-time) switch, field devices with demanding performance requirements can be implemented. The reduced chip size simplifies integration into compact field devices. The CPU also allows integration of a user's own applications, which makes an external host CPU unnecessary depending on the application.

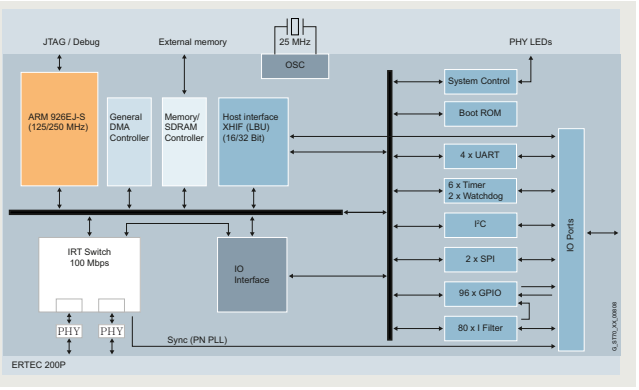
Development kit for ERTEC 200P-2

The development kit includes an evaluation board with sample applications so that commissioning can be completed in minimum time. The PROFINET stack is delivered as source code and includes the eCos open source real-time operating system and all development tools, analysis programs and documentation. Field devices with RT (real-time) and IRT (isochronous real-time) can be implemented with the ERTEC ASICs. The integrated switch allows the construction of field devices with two ports.

Functions:

- Isochronous mode
- Shared device for 4 controllers
- S2 system redundancy
- PROFINET performance upgrade with a minimum cycle time of 125 µs.
- MRP/MRPD
- Regular, no-cost updates
- Current technology certificate

Overview (continued)



Internal structure of ERTEC 200P-2

Selection and ordering data

ERTEC 200P-2 ASIC for connection to switched Ethernet 100 Mbps, Ethernet controller with integrated 2-port switch, ARM 926 processor and integrated PHYs; recommended for new developments	
• 10 units (evaluation pack)	**6ES7195-0BH02-0XA0**
• 90 units (single tray)	**6ES7195-0BH12-0XA0**
• 450 units (drypack, 5 trays)	**6ES7195-0BH22-0XA0**
• 1 000 units (tape & reel)	**6ES7195-0BH32-0XA0**
PROFINET Device Development Kit for ERTEC 200P	**6ES7195-3BE00-0YA1**
ERTEC 200 ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbps, Ethernet controller with integral 2-port switch, ARM 946 processor and integral PHYs	
• 70 units (single tray)	**6GK1182-0BB01-0AA1**
• 350 units (drypack, 5 trays)	**6GK1182-0BB01-0AA2**
• 3500 units (package, 10 drypacks)	**6GK1182-0BB01-0AA3**
• 1050 units (tape & reel)	**6GK1182-0BB01-0AA4**
ERTEC 400 ASIC ERTEC 400 for connection to Switched Ethernet 10/100 Mbps, Ethernet controller with integrated 4-port switch, ARM 946 processor and PCI interface (V2.2), data preparation for real-time and isochronous real-time for PROFINET IO	
• 70 units (single tray)	**6GK1184-0BB01-0AA1**
• 350 units (drypack, 5 trays)	**6GK1184-0BB01-0AA2**

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Technical specifications

	ERTEC 200P-2
Integrated IRT switch	2-port
Integrated PHYs	Yes
Copper and fiber-optic cable supported	Yes
Minimum cycle time	125 µs
ARM CPU	ARM 926
Clock frequency	250 MHz
Configurable IOs, general purpose IOs	96
Enclosure size	17x17 mm
Ball pitch	0.8 mm

More information

Support

The competent and experienced staff at the PROFINET Competence Centers in Europe, China and the U.S. offer free telephone advice, as well as individual and agreed development and support on-site—from initial information all the way to conclusion of the development with certification.

If you have any questions, your contact partner will be pleased to help:

Technical support

Technical information and assistance for development packages is provided by the support team:

Siemens Sanayi ve Ticaret A.Ş.
Office address:
Yakacık Caddesi No 111
34870 Istanbul, Turkey
Email: profinet.devkits.industry@siemens.com

PROFINET certification

For an efficient and successful development process, comprehensive consulting before the start of the development project is particularly important. The final step in field device development is certification. Siemens also offers you independent, accredited test labs for PROFINET, such as ComDeC in Germany, PIC in the USA, and ITEI in China, as well as a test lab in the Czech Republic.

Germany and Europe

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China

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Email: profinet.cn@siemens.com

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Overview



With the development kits for PROFINET, compact or modular PROFINET field devices can be developed quickly and with little effort. Depending on the application, different development kits are available.

The development kits for the ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller) are suitable for the development of field devices with an integrated IRT switch (Isochronous Real-Time). The demand for real-time capability, linear topology capability, and for IT integration is therefore met perfectly.

With the help of the development kit for standard Ethernet controllers, PROFINET devices can be developed on the basis of a standard Ethernet controller. Devices with RT (Real-Time) can be implemented in the field device without special hardware.

The PROFIsafe starter kit permits the implementation of fail-safe devices. In so doing, the PROFIsafe stack applicatively builds on the PROFINET stack.

Selection and ordering data

ERTEC Development Kits / Evaluation Kits	
PROFINET Device Development Kit for ERTEC 200P	**6ES7195-3BE00-0YA1**
PROFIsafe starter kit V3.5 according to the PROFIsafe V2.6.1 profile	**6ES7195-3BF03-0YA0**
ERTEC ASICs	
ERTEC 200P-2	
ASIC for connection to Switched Ethernet 100 Mbps, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs	
• 10 units (evaluation pack)	**6ES7195-0BH02-0XA0**
• 90 units (single tray)	**6ES7195-0BH12-0XA0**
• 450 units (drypack, 5 trays)	**6ES7195-0BH22-0XA0**
• 1 000 units (tape & reel)	**6ES7195-0BH32-0XA0**

More information

More information is available on the internet under this link.

Licensing

All of the development kits contain a development license which authorizes the user to develop and test PROFINET devices on the basis of the stack provided.

For the production of series devices, one product line license with Article No. 6ES7195-3BC10-0YA0 must also be obtained for each product line.

For detailed information on the currently applicable licensing rules, contact our Competence Centers ComDeC and PIC.

Support

The competent and experienced staff at the PROFINET Competence Centers in Europe, China and the U.S. offer free telephone advice, as well as individual and agreed development and support on-site—from initial information all the way to conclusion of the development with certification.

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Technical support

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Yakacık Caddesi No 111
34870 Istanbul, Turkey
Email: profinet.devkits.industry@siemens.com

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Germany and Europe

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China

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Overview

PROFINET driver for controllers

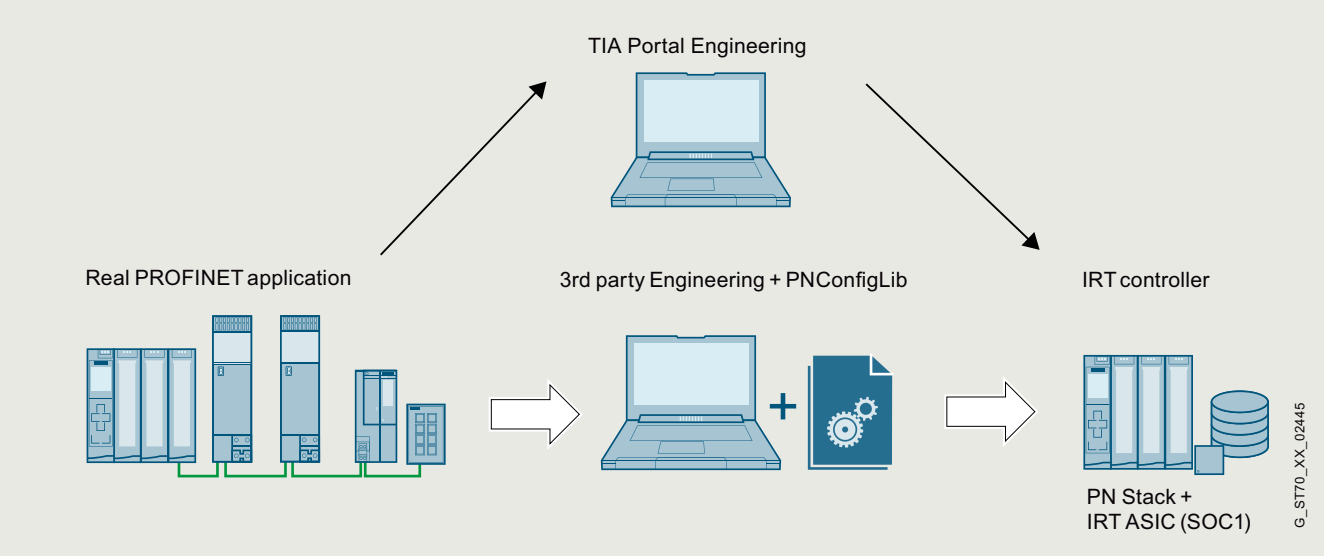
Reasonably priced components are a major competitive advantage, especially in series machine building. Here, users often develop in-house control software. For reasons of performance, flexibility and cost, the individual application is then implemented on standard PCs. The PROFINET driver supports this in-house development and requires no special hardware thanks to its conventional Ethernet interface.

Because the PROFINET driver is delivered as source code, proprietary solutions can be ported into various operating systems and hardware platforms. As a result, the PROFINET driver can also be optimally used in embedded systems for in-house controller solutions. Design and configuration is easy and takes place via an open XML interface without the need for engineering tools. The well-proven PROFINET stack from SIMATIC forms the centerpiece.

The PROFINET driver is suitable for both simple applications, such as individual PROFINET lines, as well as for complex machines. It supports PROFINET RT for cycle times starting from 1 ms via a standard Ethernet interface. Alternatively, PROFINET IRT can also be used for cycle times starting from 500 µs, in connection with the CP1625 controller development kit.

PROFINET ConfigLib

PROFINET networks must be planned. This can be carried out for the PROFINET driver using the TIA Portal. A license is not required. ConfigLib is a standalone API for generating PROFINET hardware configurations. It can be used to create RT and IRT projects, whereby ConfigLib takes over the planning algorithm.



PNConfigLib – Efficient creation of hardware configurations without the TIA Portal

CP1625 Controller Development Kit

Siemens SOC1 gives you the hardware support required to build an IRT controller. The CP1625 Controller Development Kit is suitable for both standalone and host modes.

- Stand-alone mode: PN stack and application run on the CP1625
- Host mode: Application runs on the PC or, for example, ARM. The stack runs on the CP1625



SIMATIC CP1625

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Selection and ordering data

PROFINET driver	
For connecting distributed I/O and drives to user-specific control applications via PROFINET	
Development kit PROFINET controller and device for download; source code with example implementation, IRT controller in connection with CP1625 or CP1625 Dev (to be ordered separately); Consignee email address required for delivery	**6ES7195-3AA00-0YA1**
SIMATIC CP1625 Development Board; PCIe card for PROFINET IRT	**6ES7648-2CF10-1BA0**
Runtime licenses	
• 1 unit	**6ES7195-3AA05-0XA0**
• 10 units	**6ES7195-3AA10-0XA0**
• 50 units	**6ES7195-3AA20-0XA0**
• 200 units	**6ES7195-3AA30-0XA0**
• 500 units	**6ES7195-3AA40-0XA0**

More information

Support

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Phone: +1 (423) - 262 - 2576
Email: pic.industry@siemens.com
Web: www.profiinterfacecenter.com

China

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7, Wang Jing Zhong Huan Nan Lu, Chaoyang District, Beijing
100102, PR. China
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Overview



- Used to terminate bus segments at transfer rates of 9.6 Kbps to 12 Mbps
- Power supply independent of the bus nodes

Designed for Industry

- End-device independent bus termination thanks to own power supply

Selection and ordering data

Active RS 485 terminating element for PROFIBUS For terminating bus segments at transmission rates of 9.6 kbps to 12 Mbps	**6ES7972-0DA00-0AA0**

Technical specifications

Article number	**6ES7972-0DA00-0AA0** **RS485 Termin. resistor f. PROFIBUS/MPI,**
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	30 mA
Power loss	
Power loss, max.	0.72 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at +25 °C
Connection method	
Design of electrical connection for supply voltage	Screw terminal block
Design of electrical connection for PROFIBUS cables	Screw terminal block
Dimensions	
Width	60 mm
Height	70 mm
Depth	43 mm
Weights	
Weight, approx.	95 g

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More information

Selection tools

Two tools, the SIMATIC NET Selection Tool and the TIA Selection Tool, are available to assist you in selecting the right cabling system for SIMATIC NET:

- this link or
- this link.

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Overview



- Automatic detection of transfer rates
- Transfer rates from 9.6 Kbps to 12 Mbps are possible, incl. 45.45 Kbps
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

Designed for Industry

- For increasing the expansion
- Galvanic isolation of segments
- Commissioning support
  - Switches for separation of segments
  - Bus activity display
  - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostic repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality.

Selection and ordering data

RS 485 repeater for PROFIBUS Transfer rate up to max. 12 Mbps, 24 V DC, IP20 enclosure	**6ES7972-0AA02-0XA0**

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Technical specifications

Article number	6ES7972-0AA02-0XA0 Repeater RS485 f. PROFIBUS/MPI
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, max.	100 mA; 100 mA without loads at PG/OP socket; 130 mA load at PG/OP socket (5 V/90 mA); 200 mA load at PG/OP socket (24 V/100 mA)
Power loss	
Power loss, typ.	0.7 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C
Connection method	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	2 terminal blocks
Dimensions	
Width	45 mm
Height	128 mm
Depth	59.3 mm
Weights	
Weight, approx.	350 g

More information

Selection tools

Two tools, the SIMATIC NET Selection Tool and the TIA Selection Tool, are available to assist you in selecting the right cabling system for SIMATIC NET:

- this link or
- this link.

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Overview



- Used to terminate bus segments at transfer rates of 9.6 Kbps to 12 Mbps
- Power supply independent of the bus nodes

Designed for Industry

- End-device independent bus termination thanks to own power supply

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Technical documentation on SIPLUS can be found here:

http://www.siemens.com/siplus-extreme

Selection and ordering data

SIPLUS active RS 485 terminating element for PROFIBUS	
To terminate bus segments at transfer rates of 9.6 kbps to 12 Mbps	
Extended temperature range and exposure to environmental substances	**6AG1972-0DA00-2AA0**

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Technical specifications

Article number	6AG1972-0DA00-2AA0 SIPLUS Profibus Terminator
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	30 mA
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Connection method	
Design of electrical connection for supply voltage	Screw terminal block
Design of electrical connection for PROFIBUS cables	Screw terminal block
Dimensions	
Width	60 mm
Height	70 mm
Depth	43 mm

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Technical specifications (continued)

Article number	6AG1972-0DA00-2AA0 SIPLUS Profibus Terminator
Weights	
Weight, approx.	95 g

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Overview



- Automatic detection of transfer rates
- 45.45 Kbps transfer rate is possible
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

Designed for Industry

- For increasing the number of participants and the expansion
- Galvanic isolation of segments
- Commissioning support
  - Switches for separation of segments
  - Bus activity display
  - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostic repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described in "Distributed I/O / Diagnostics / Diagnostic repeater for PROFIBUS DP".

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Technical documentation on SIPLUS can be found here:

Selection and ordering data

SIPLUS RS 485 repeater for PROFIBUS	
Transfer rate up to max. 12 Mbps, 24 V DC, enclosure IP20	
Extended temperature range and exposure to environmental substances	**6AG1972-0AA02-7XA0**

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Technical specifications

Article number	6AG1972-0AA02-7XA0 SIPLUS DP RS485-Repeater
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, max.	100 mA; 100 mA without loads at PG/OP socket; 130 mA load at PG/OP socket (5 V/90 mA); 200 mA load at PG/OP socket (24 V/100 mA)
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Connection method	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	2 terminal blocks
Dimensions	
Width	45 mm

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Technical specifications (continued)

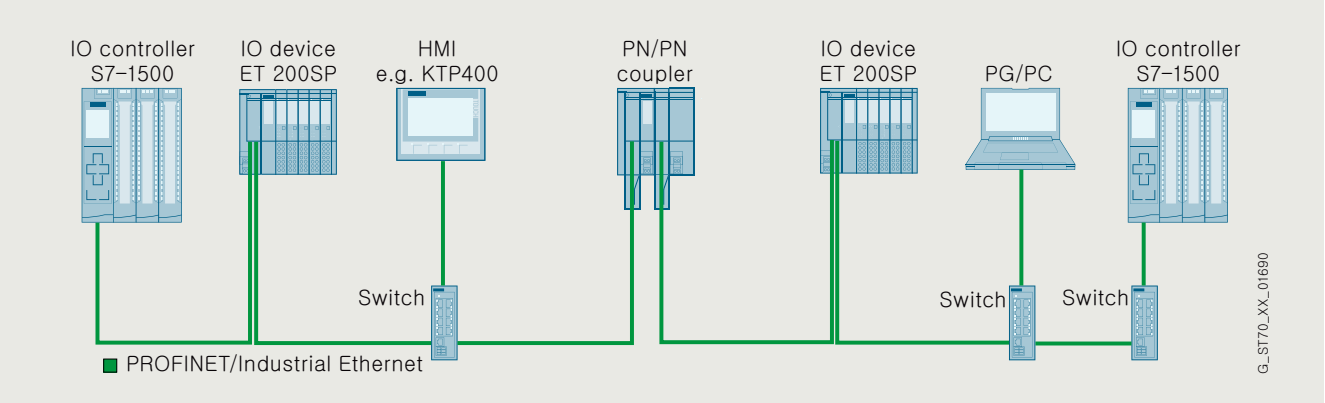
Article number	6AG1972-0AA02-7XA0 SIPLUS DP RS485-Repeater
Height	128 mm
Depth	67 mm
Weights	
Weight, approx.	350 g

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Overview



- Fast deterministic data exchange between CPUs with PROFINET controller, even beyond network boundaries
- Configuration with two PROFINET devices completely independent of the communication technology



Data transmission between two S7-1500 IO controllers beyond a PROFINET limit

- Very simple configuration of the data exchange via virtual IO modules or alternatively via data records for larger amounts of data
- Simultaneous data transfer to up to 3 CPUs on own network side and/or up to 4 CPUs on opposite network side
- Easy to integrate into any PROFINET network with 2 ports per network side
- Fieldbus connection via a SIMATIC BusAdapter; this allows free selection of the connection system (RJ45, FC cable direct connection) and connection hardware (copper, POF, PCF, fiberglass). FO-to-copper media conversion can also be realized economically and without external converters.

Additional functions

- Quantity structures
  - Cyclic transmission: Up to 1440 bytes each for input and output data
  - Data record transfer: Up to 4096 bytes per slot. Buffering of up to eight data records per slot
  - Maximum 16 input/output areas for data exchange
  - Max. 254 bytes of input and 253 bytes of output data per module
- Exchange of fail-safe data between two F-CPUs via F-SendDP and F_ReceiveDP
- Shared device with up to four IO controllers per network side
- Module-internal shared input / shared output (MSI/MSO)
- Device replacement without programming device
  - With topological configuration via proximity detection (LLDP)
  - Without topological configuration via redundant storage of the station name in the BusAdapter. A separate removable memory card is not required.
- Reset button for restoring the factory settings
- Redundant power supply
- Galvanic isolation between the two PROFINET IO subnets

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Overview (continued)

- Media redundancy (MRP and MRPD)
- I&M data
- Firmware update
- Support for Ethernet services (ping, arp, SNMP, MIP-2, LLDP)
- Comprehensive diagnostics via LED displays and interrupts
- Extensive compatibility with the PN/PN coupler up to firmware version V3.0

Selection and ordering data

SIMATIC PN/PN coupler For deterministic data exchange between max. 4 PN controllers per side, also beyond network boundaries, transfer of PROFIsafe, I/O, MSI, MSO and data record communication, redundant power supply, PN connection via SIMATIC BusAdapter (BA), supplied without BusAdapter	**6ES7158-3AD10-0XA0**
Accessories	
DIN rail 35 mm	
SIMATIC, DIN rail 35 mm Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
SIMATIC, DIN rail 35 mm, length 2 m	**6ES5710-8MA41**
SIMATIC ET 200SP, BA 2xRJ45 BusAdapter 2 RJ45 sockets	**6ES7193-6AR00-0AA0**
SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connection	**6ES7193-6AF00-0AA0**
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	**6ES7193-6AP00-0AA0**
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	**6ES7193-6AP20-0AA0**
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	**6ES7193-6AP40-0AA0**
SIMATIC BA 2XLC BusAdapter 2x LC glass fiber-optic cable connections	**6ES7193-6AG00-0AA0**
SIMATIC BusAdapter: BA LC/RJ45 Media converter glass FOC/CU 1x LC FO connection and 1x RJ45 connection	**6ES7193-6AG20-0AA0**
SIMATIC BusAdapter: BA LC/FC Media converter glass FOC/CU 1x LC FO connection and 1x FastConnect (FC) connection	**6ES7193-6AG40-0AA0**
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	**6ES7193-6LF30-0AW0**
Labeling strips	
SIMATIC ET 200SP, 500 labeling strips light gray, roll with 500 strips	**6ES7193-6LR10-0AA0**
SIMATIC ET 200SP, 500 labeling strips yellow, roll with 500 strips	**6ES7193-6LR10-0AG0**
SIMATIC ET 200SP, 1000 labeling strips light gray, 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AA0**
SIMATIC ET 200SP, 1000 labeling strips yellow gray, 10 sheets DIN A4, perforated, paper, 180 g/sqm	**6ES7193-6LA10-0AG0**
Spare parts	
Cover for BusAdapter interface 5 units	**6ES7591-3AA00-0AA0**
Power supply connector	

Selection and ordering data (continued)

Plug, socket, 2x2-pole, for ET 200SP, interface module, KP32F, PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	**6ES7193-4JB00-0AA0**

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Technical specifications

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
General information	
Product type designation	PN/PN coupler
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes; 500 µs
• Tool changer	Yes; Docking station and docking unit
• Local coupling, IO data	Yes
- Number of coupling modules	16; in non-isochronous mode, otherwise 3
- Number of coupling submodules per module	4; 1x write, 3x read in non-isochronous mode, otherwise see description in the manual
• Local coupling, data records	Yes; in non-isochronous mode
- Number of coupling modules	16
- Number of coupling submodules per module	4; 1x write, 3x read
- Record length, max.	4 096 byte
- FIFO depth in storage mode	8
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V20 or higher
• STEP 7 configurable/integrated from version	V5.7 SP3
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
Installation type/mounting	
Mounting	Mounting rail 7.5 mm and 15 mm
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Address area	
Address space per station	
• Address space per station, max.	1 440 byte; per input / output
Hardware configuration	
Submodules	
• Number of submodules per station, max.	116
Interfaces	
Number of PROFINET interfaces	2; via BusAdapter
Optical interface	Yes; Via SIMATIC BusAdapter
Transmission rate, max.	100 Mbit/s
1. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
PROFINET IO Device	
- Services	
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- Prioritized startup	Yes
- Shared device	Yes
2. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC

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Technical specifications (continued)

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
PROFINET IO Device	
- Services	
- IRT	Yes
- Dynamic Frame Packing (DFP)	Yes
- Prioritized startup	Yes
- Shared device	Yes
Interface types	
RJ 45 (Ethernet)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	No
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
EtherNet/IP	No
Protocols (Ethernet)	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
PROFINET IO Device	
- Services	
- IRT	Yes
- PROFIenergy	No
- Prioritized startup	Yes; in non-isochronous mode
- Shared device	Yes; in non-isochronous mode
- Number of IO Controllers with shared device, max.	4; per line side
Redundancy mode	
• PROFINET system redundancy (S2)	Yes; NAP S2 acc. to IEC, only in non-isochronous mode
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
- Media redundancy	
- MRP	Yes
- MRPD	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes; Parameterizable
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• LINK LED	Yes; 2x green link LEDs on BusAdapter
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Monitoring 24 V voltage supply ON (green)	Yes; for each side

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Technical specifications (continued)

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Standards, approvals, certificates	
Network loading class	3
Security	
PROFINET Security Class	1
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C; From FS05
• max.	60 °C; = Tmax for horizontal installation; for vertical installation Tmax = 50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see section "Climatic and mechanical environmental conditions"
Mechanics/material	
Strain relief	Yes; Optional, for RJ45 and FC BusAdapter only
Dimensions	
Width	100 mm; Minimized with good handling
Height	117 mm
Depth	74 mm; with mounting rail
Weights	
Weight, approx.	200 g; without BusAdapter

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Overview



- For data exchange between PROFINET and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
  - Node / lifeguarding
  - Heartbeat
  - SYNC (producer / consumer)
- Configuration in TIA via HSP from TIA Portal V14 or integrated from TIA Portal V18
- PROFINET switch and 9-pin D-sub plug integrated for CAN
- Up to 126 CAN nodes
- 512 receiver/transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Integrated data logger tool enables monitoring of CAN bus traffic
- Supported controllers: S7-1200, S7-1500, ET 200SP, Open Controller

Selection and ordering data

SIMATIC PN/CAN LINK PROFINET gateway according to CAN or CANopen networks CAN Bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302; IP20	**6BK1620-0AA00-0AA0**

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Technical specifications

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
General information	
Product type designation	PN/CAN Link
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V14 or higher
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
Rail mounting	Yes
Control cabinet installation	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Interfaces	
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
1. Interface	
Interface type	CAN according to CiA 303-1
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
• Design of the connection	9-pin sub D socket
CAN	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	50 kbit/s
• Transmission rate, max.	1 000 kbit/s
• max. number of devices	126
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	512; Send / receive
- Services	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes
2. Interface	
Interface type	PROFINET
Isolated	Yes; 1 500 V AC or 2 250 V DC

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Technical specifications (continued)

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
Marine approval	
• Germanischer Lloyd (GL)	Yes
• American Bureau of Shipping (ABS)	Yes
• Bureau Veritas (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (Class NK)	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

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Overview



- For data exchange between PROFINET and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
  - Node / lifeguarding
  - Heartbeat
  - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V14 or higher
- PROFINET switch and 9-pin SUB-D plug integrated for CAN
- Up to 126 CAN nodes
- 512 receiver/transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Supported controllers: S7-1200, S7-1500, ET 200SP, Open Controller

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Technical documentation on SIPLUS can be found here:

http://www.siemens.com/siplus-extreme

Selection and ordering data

SIPLUS PN/CAN Link PROFINET gateway according to CAN Bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302; IP20 Ambient temperature -40 ... +70 °C (+85 °C for 10 min.)	**6AG1620-0AA00-7AA0**

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Technical specifications

Article number	6AG1620-0AA00-7AA0 SIPLUS PN/CAN LINK
General information	
Product type designation	PN/CAN Link
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
• PROFINET from GSD version/GSD revision	GSDML V2.4.x
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
Rail mounting	Yes
Control cabinet installation	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Interfaces	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
1. Interface	
Interface type	CAN according to CiA 303-1
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
• Design of the connection	9-pin sub D socket
CAN	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	50 kbit/s
• Transmission rate, max.	1 000 kbit/s
• max. number of devices	126
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	512; Send / receive
- Services	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes
2. Interface	
Interface type	PROFINET

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Technical specifications (continued)

Article number	6AG1620-0AA00-7AA0 SIPLUS PN/CAN LINK
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO device	Yes
• Open IE communication	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin
• vertical installation, max.	55 °C; = Tmax
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance	
- Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
- Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; in preparation
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
- Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life

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Technical specifications (continued)

Article number	6AG1620-0AA00-7AA0 SIPLUS PN/CAN LINK
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

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Overview



- For data exchange between PROFINET and SAE J1939 networks
- J1939 functions:
  - Broadcast Announce Message (BAM)
  - Connection Mode Data Transfer (CMDT)
  - PDU 1 & 2
- Integration into TIA via GSDML file in TIA Portal. No separate software required
- Integrated PROFINET switch with 9-pin SUB-D socket for J1939
- Up to 253 logical nodes
- Up to 30 addressable ECUs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Supported controllers: S7-1200, S7-1500, ET 200SP, Open Controller

Selection and ordering data

SIMATIC PN/J1939 LINK PROFINET gateway to J1939 networks; IP20	**6BK1623-0AA00-0AA0**

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Technical specifications

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
General information	
Product type designation	PN/J1939 LINK
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V14 SP1 or higher
• PROFINET from GSD version/GSD revision	GSDML V2.3.x
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
Rail mounting	Yes
Control cabinet installation	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms; PN side
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Interfaces	
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
1. Interface	
Interface type	J1939 according to the standard "SAE J1939"
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
• Design of the connection	9-pin sub D socket
CAN	
• CAN operating modes	J1939 according to the standard "SAE J1939"
• Transmission rate, min.	100 kbit/s
• Transmission rate, max.	500 kbit/s
• max. number of devices	30
J1939	
• Addressable ECUs, max.	30
• Logical nodes, max.	253
• PDU 1	Yes
• PDU 2	Yes
• DM data	Yes
• BAM	Yes
• CMDT	Yes
• PGN request	Yes

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Technical specifications (continued)

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
2. Interface	
Interface type	PROFINET
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
Marine approval	
• Germanischer Lloyd (GL)	Yes
• Bureau Veritas (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (Class NK)	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

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Overview

Product phase-out of the SIMATIC PN/BACnet Link

As part of the further development of the product portfolio and in light of regulatory requirements, particularly the EU Cyber Resilience Act (CRA), the product phase-out of the SIMATIC PN/BACnet Link (6BK1621-0AA00-0AA0) is hereby announced effective October 1, 2026. Type cancellation will take place on October 1, 2027.

A functional replacement is available from our technology and product partner MBS GmbH at the following link.

You can find more information at the following link.

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Overview

Product phase-out of the SIMATIC PN/M-Bus Link

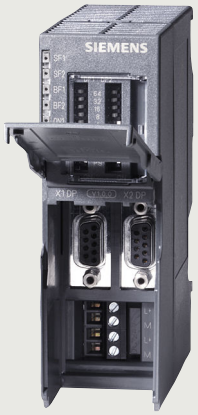
As part of the further development of the product portfolio and in light of regulatory requirements, particularly the EU Cyber Resilience Act (CRA), the product phase-out of the SIMATIC PN/M-Bus Link (6BK1622-0AA00-0AA0) is hereby announced effective October 1, 2026. Type cancellation will take place on October 1, 2027.

A functional replacement is available from our technology and product partner MBS GmbH at the following link.

You can find more information at the following link.

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Overview



- For interconnecting two PROFIBUS DP networks
- The interchange of data between both DP networks takes place by internal copying in the coupler

Selection and ordering data

SIMATIC DP, DP/DP coupler Coupling module for connecting two PROFIBUS DP networks, redundant power supply	**6ES7158-0AD01-0XA0**

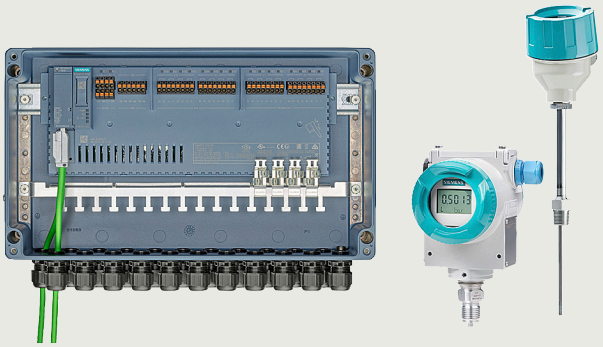
Note:
The manual is available free of charge on the Internet.

Technical specifications

DP/DP transceiver	
PROFIBUS transmission rate	max. 12 Mbit/s
Interfaces	
• PROFIBUS DP	9-pin Sub-D connector
Supply voltage	24 V DC
Current consumption typ.	150 mA
Mounting	Upright (DIP switches above)
Perm. environmental conditions	
• Operating temperature	
- horizontal mounting	0°C ... +60°C
- all other mounting positions	0°C ... +40°C
• Transport/storage temperature	-40 °C ... +70 °C
• Relative humidity	10-95 % at +25 °C
Design	
• Dimensions (W x H x D) in mm	40 x 127 x 117
• Weight	approx. 250 g
Degree of protection	IP20

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Overview



Smart Field Distributor – SIMATIC Compact Field Unit

With the new SIMATIC Compact Field Unit (CFU), we are re-interpreting the conventional approach to field device connection. The smart field distributor is installed at the process level and is connected via PROFINET, the world's leading Industrial Ethernet standard, directly to the automation system to form the foundation for digitalization in the field.

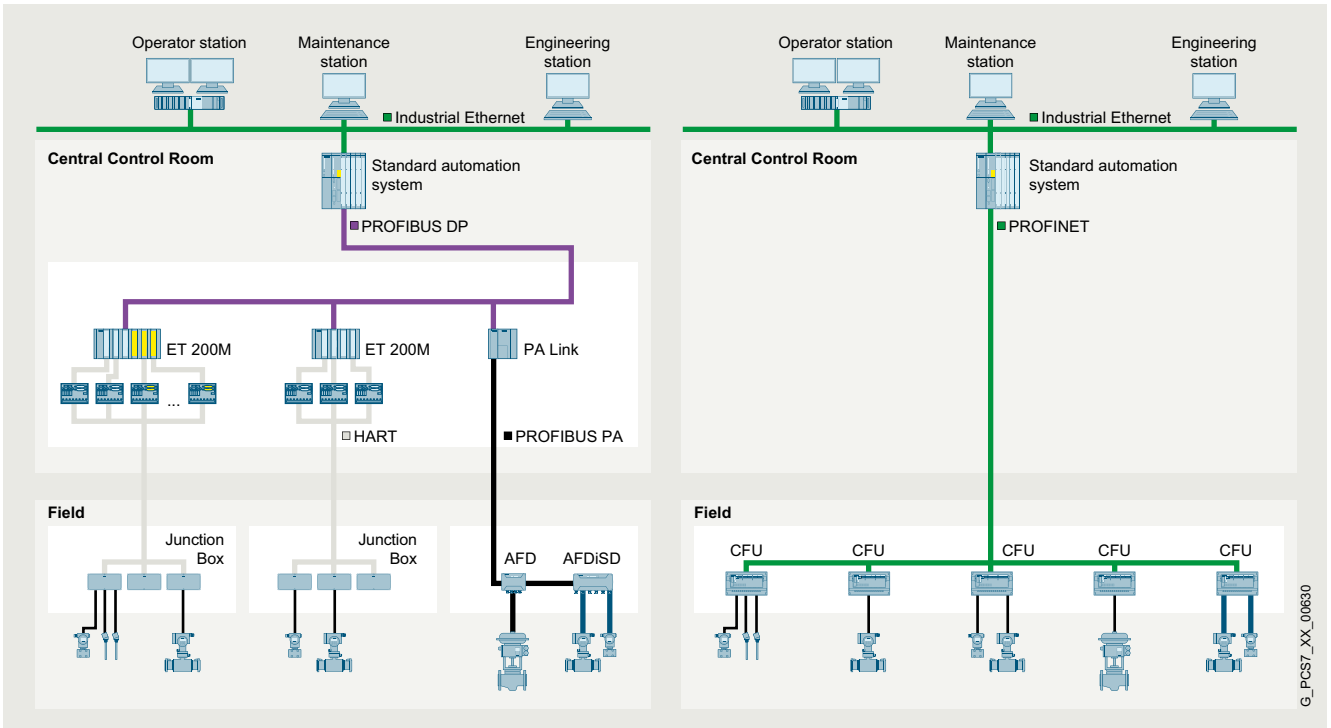
You benefit from greater flexibility and very simple handling coupled with maximum availability. This allows you to efficiently transfer your familiar system concept to the digital world.

Today's challenges for field device connection:

- High overhead for device integration and replacement
- Complicated, error-prone wiring and routing over multiple levels, making the hardware FAT very complex
- Extremely long copper cables and numerous terminal points in the field
- Multiple individual control cabinets
- Large numbers of different components and protocols necessitate costly spare parts inventories and training sessions
- High planning and documentation costs

SIMATIC CFU – The answer to these challenges

Mode of operation



Field device connection with previous technology (left) and with SIMATIC CFU (right)

The SIMATIC Compact Field Unit (CFU) is a real game-changer in field device connection and offers you entirely new prospects regarding simplicity, flexibility and standardization. The smart field distributor is installed at the process level and is connected via

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Overview (continued)

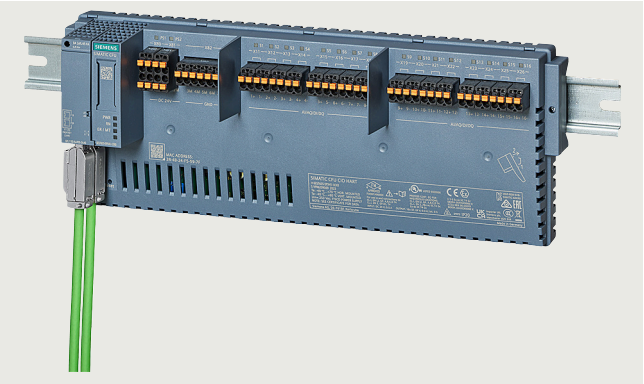
PROFINET directly to the automation system to form the foundation for digitalization in the field. Utilization of digital fieldbus communication considerably simplifies device interfacing compared to conventional 4 ... 20 mA engineering.

Greater flexibility thanks to consistent decentralization

Distributed installation of the SIMATIC CFU means that classic control cabinets are no longer required and you can make considerable savings in cabling and the number of terminal points, as well as reducing planning and documentation overheads. The high granularity (16 I/O per SIMATIC CFU) enables flexible assignment to the higher-level controllers.

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Overview



SIMATIC CFU CIO HART edition, in this case with BusAdapter, PROFINET bus cable and push-in terminals

SIMATIC CFU CIO HART edition

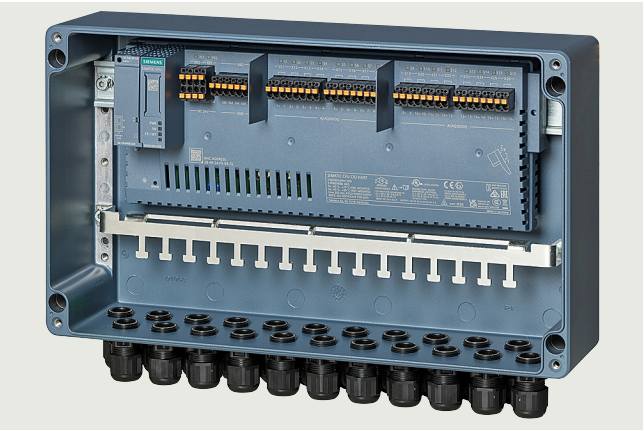
One device for all signal types

The SIMATIC CFU CIO HART is an innovative PROFINET device and offers the possibility of flexibly connecting all signal types to any channel. It is possible to process analog inputs (optionally with HART), analog outputs (optionally with HART), digital inputs and digital outputs. The corresponding signal types are configured conveniently using drag-and-drop in engineering. The SIMATIC CFU CIO HART thus offers a versatile solution for using the different signal types in your system with just one device.

16 freely configurable IO channels:

- Analog input/analog output:
  - 0-20 mA, 4-20 mA, 4-20 mA with HART
- Digital input/digital output:
  - Multiple modes available: Standard-DI, DI-Namur, DI Open-Collector
  - Counter up to 5 kHz
  - DI 24 V DC; DQ 24 V DC 0.5/2 A

Aluminum field enclosure



SIMATIC CFU CIO HART edition, aluminum field enclosure, open

Overview (continued)



SIMATIC CFU CIO HART edition, aluminum field enclosure, closed

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure scope of supply:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has an inspection window for LED diagnostics.

Selection and ordering data

SIMATIC CFU CIO HART with aluminum enclosure Comprising: • 1 × SIMATIC CFU CIO HART (6ES7655-5PX41-1XX0) • 1 × aluminum enclosure with cable glands, shield busbar, shield terminals pre-assembled and tested	**6ES7655-5PX41-1AX0**
SIMATIC CFU CIO HART SIMATIC Compact Field Unit CIO HART edition with 16 × freely configurable channels (AI; AQ; HART; DI 24 V DC; DI NAMUR; DQ 24 V DC 0.5/2 A; Counter) • Installation up to hazardous zone 2 • Channel diagnostics • PROFINET interface • Use of PROFINET BusAdapter • Configuration in RUN (CiR) • Media redundancy (MRP) • PROFINET system redundancy (S2) • Temperature range -40 ... +70 °C • Installation on a 35 mm DIN rail	**6ES7655-5PX41-1XX0**

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Technical specifications

Article number	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing
General information		
Product type designation	CFU CIO HART	CFU CIO HART with aluminum enclosure
Number of channels	16	16
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
• The user can configure digital channels as input/output as required	Yes	Yes
• Digital channels can be parameterized	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V19 Update 2	V19 Update 2
• STEP 7 configurable/integrated from version	STEP 7 V5.7.1.4	STEP 7 V5.7.1.4
• PCS 7 configurable/integrated from version	V9.1 SP2 UC7 (+PDM V9.3 Upd1)	V9.1 SP2 UC7 (+PDM V9.3 Upd1)
• PROFIBUS from GSD version/GSD revision	- / -	- / -
• PROFINET from GSD version/GSD revision	GSDML V2.43 2024.03.04	GSDML V2.43 2024.03.04
Operating mode		
• DI	Yes	Yes
• Counter	Yes	Yes
• DQ	Yes	Yes
Installation type/mounting		
Mounting	on 35 mm DIN rail, 2 spacing units wide	For horizontal and vertical mounting
Mounting position	Horizontal, vertical	Horizontal, vertical
Recommended mounting position	horizontal set up	horizontal set up
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Short-circuit protection	Yes	Yes
redundant power supply	Yes	Yes
Mains buffering		
• Mains/voltage failure stored energy time	1 ms; For communication	1 ms; For communication
Input current		
Current consumption (rated value)	4.1 A; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 2 A each	4.1 A; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 2 A each
Current consumption, max.	9 A	9 A
Inrush current, max.	7 A	7 A
I^2t	0.5 $A^2 \cdot s$	0.5 $A^2 \cdot s$
Encoder supply		
Number of outputs	16	16
Output voltage, min.	12 V	12 V
Short-circuit protection	Yes; Electronic	Yes; Electronic
Output current		
• up to 60 °C, max.	8 A; total current DQ + additional current for analog channels	6 A; total current DQ + additional current for analog channels
• up to 70 °C, max.	6 A; total current DQ + additional current for analog channels	
Power loss		
Power loss, typ.	6.6 W; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 12 ohms load each	6.6 W; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 12 ohms load each
Address area		
Address space per station		
• Address space per station, max.	1 440 byte; Dependent on configuration	1 440 byte; Dependent on configuration
Digital inputs		
Number of digital inputs	16	16
Digital inputs, parameterizable	Yes	Yes
Sourcing/sinking input	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes

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Technical specifications (continued)

Article number	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing
Input characteristic curve in accordance with IEC 61131, type 2	No	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Pulse extension	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Digital input functions, parameterizable		
• Gate start/stop	Yes; hardware gate, usable by multiple DI counters	Yes; hardware gate, usable by multiple DI counters
• Freely usable digital input	Yes; Parameterizable input filter	Yes; Parameterizable input filter
• Counter	Yes	Yes
- Number, max.	16	16
- Counting frequency, max.	5 kHz; fast counter mode, sinking input; 1 kHz sourcing input, NAMUR	5 kHz; fast counter mode, sinking input; 1 kHz sourcing input, NAMUR
- Counting width	32 bit	32 bit
- Counting direction up/down	Yes; Up	Yes; Up
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-9 V to +5 V	-9 V to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.5 mA; max: 2.5 mA sourcing input; 2.3 mA sinking input; 10 mA fast counter; 6.5 mA NAMUR	2.5 mA; max: 2.5 mA sourcing input; 2.3 mA sinking input; 10 mA fast counter; 6.5 mA NAMUR
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	Yes; none / 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; none / 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	16
Current-sinking	No	No
Current-sourcing	Yes	Yes
Short-circuit protection	Yes	Yes
• Response threshold, typ.	4.1 A	4.1 A
Open-circuit detection	Yes	Yes
Overload protection	Yes	Yes
Limitation of inductive shutdown voltage to	typ. L+ (-11 V)	typ. L+ (-11 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	2 A	2 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	12 Ω	12 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• Type of output voltage	DC	DC
• for signal "1", min.	Ue minus 1 V	Ue minus 1 V
Output current		
• for signal "1" rated value	2 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA
Output delay with resistive load		
• "0" to "1", typ.	50 µs	50 µs
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", typ.	50 µs	50 µs

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Technical specifications (continued)

Article number	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing
• "1" to "0", max.	100 µs	100 µs
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	No	No
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	1 Hz; at 2 A; 2 Hz at 0.5 A	1 Hz; at 2 A; 2 Hz at 0.5 A
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	2 A	2 A
- horizontal installation		
- up to 60 °C, max.	8 A	6 A
- up to 70 °C, max.	6 A	
- vertical installation		
- up to 60 °C, max.	8 A	6 A
- up to 70 °C, max.	6 A	
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Analog inputs		
Number of analog inputs	16	16
Input ranges (rated values), currents		
• 0 to 20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
HART communication		
• Primary Master	Yes	Yes
• input resistance (with HART communication)	233 Ω	233 Ω
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Analog outputs		
Number of analog outputs	16; short-circuit proof with respect to ground	16; short-circuit proof with respect to ground
Output ranges, current		
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	No	No
• 4 mA to 20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Connection of actuators		
• for current output two-wire connection	Yes	Yes
Load impedance (in rated range of output)		
• for current outputs, min.	50 Ω	50 Ω
• with current outputs, max.	750 Ω	750 Ω
• with current outputs, inductive load, max.	10 mH	10 mH
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes; channel by channel	Yes; channel by channel
Smoothing of measured values		
• Parameterizable	Yes; none, weak, medium, strong, channel-by-channel	Yes; none, weak, medium, strong, channel-by-channel
Analog value generation for the outputs		
Settling time		

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Technical specifications (continued)

Article number	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing
• for resistive load	2 ms; 750 ohm	2 ms; 750 ohm
• for inductive load	1.2 ms	1.2 ms
Encoder		
Connection of signal encoders		
• for current measurement as 2-wire transducer	Yes	Yes
Connectable encoders		
• NAMUR encoder/changeover contact according to EN 60947	Yes; no CO contact	Yes; no CO contact
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Current, relative to input range, (+/-)	0.1 %	0.1 %
• Current, relative to output range, (+/-)	0.1 %	0.1 %
Interfaces		
Number of PROFINET interfaces	1	1
1. Interface		
Interface type	PROFINET	PROFINET
Isolated	Yes	Yes
Interface types		
• Number of ports	2; via BusAdapter	2; via BusAdapter
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes	Yes
Protocols		
• PROFINET IO device	Yes	Yes
• Media redundancy	Yes; as MRP client	Yes; as MRP client
Interface types		
RJ 45 (Ethernet)		
• 100 Mbps	Yes	Yes
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
HART protocol	Yes	Yes
• Protocol version	up to Revision 7	up to Revision 7
Redundancy mode		
• PROFINET system redundancy (S2)	Yes; Type S2	Yes
- Media redundancy		
- MRP	Yes	Yes
Open IE communication		
• LLDP	Yes	Yes
Interrupts/diagnostics/status information		
Status indicator	Yes	Yes
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Maintenance interrupt	Yes	Yes
• Limit value alarm	Yes	Yes
• Hardware interrupt	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel	Yes; channel by channel

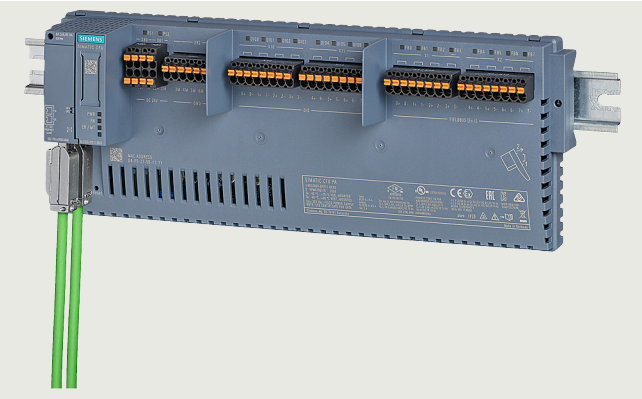
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Technical specifications (continued)

Article number	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing
• Group error	Yes	Yes
• Overflow/Underflow	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green/red LED	Yes; green/red LED
• Channel status display	Yes; green/red LED	Yes; green/red LED
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Integrated Functions		
Frequency measurement	Yes	Yes
• Number of frequency meters	16	16
Counting functions		
• Continuous counting	Yes	Yes
• Counter response parameterizable	Yes	Yes
• Hardware gate via digital input	Yes	Yes
• Software gate	Yes	Yes
Measuring functions		
• Dynamic measurement period adjustment	Yes	Yes
- Measuring range		
- Frequency measurement, min.	0.1 Hz	0.1 Hz
- Frequency measurement, max.	25 kHz; fast counter mode, sinking input; 1 kHz sourcing input, NAMUR	25 kHz; fast counter mode, sinking input; 1 kHz sourcing input, NAMUR
- Accuracy		
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation	100 ppm; depending on measuring interval and signal evaluation
Potential separation		
Potential separation digital inputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Potential separation digital outputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP20	IP66
Connection method		
Design of electrical connection	Connection plug	Connection plug
Dimensions		
Width	329 mm	414 mm
Height	123 mm	266 mm
Depth	74 mm	111 mm
Weights		
Weight, approx.	0.7 kg	5.5 kg

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Overview



SIMATIC CFU here with BusAdapter, PROFINET bus cable and push-in terminals

SIMATIC CFU PA edition

Plug-and-produce simplicity

Digitalization requires a digital infrastructure facilitating integrated digital communication right down to the sensors and actuators. You can use the established and proven PROFIBUS PA standard to achieve this. It is integrated into the PA edition of the SIMATIC CFU, thus combining ruggedness and easy handling with all the advantages of the PROFINET standard based on Industrial Ethernet. Connected devices are automatically addressed. The device is integrated via standardized communication profiles.

This innovative new implementation of the PROFIBUS PA concept makes it possible to combine the simplicity of a point-to-point wiring system with the scalability of digital PROFIBUS PA fieldbus communication. As with digital field devices, it is not necessary to know prior to connection whether the discrete field device is a sensor or actuator – This can be easily configured afterwards via software.

Combination of digital fieldbus and discrete I/Os

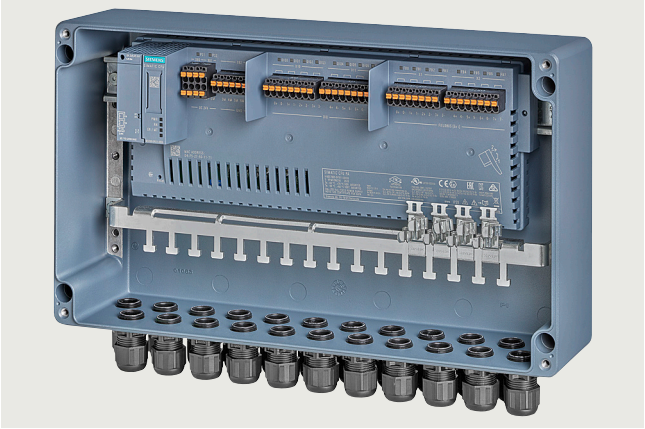
- 8 × digital fieldbus (PROFIBUS PA)
- 8 × digital inputs/outputs, freely configurable (1 x counter functionality / frequency measurement)

Easy to use

- Automatic addressing of PROFIBUS PA field devices
- System-supported detection and integration of PROFIBUS PA field devices into the process control system
  - Utilization of standardized PA profiles
  - Commissioning, device replacement and maintenance wizards
- Implementation of diagnostic messages according to NAMUR NE 107
- Installation on a 35 mm DIN rail

Overview (continued)

Aluminum field enclosure



CFU PA with RJ45 and push-in terminals, aluminum field enclosure, open



SIMATIC CFU aluminum field enclosure, closed

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure scope of supply:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has an inspection window for LED diagnostics.

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Selection and ordering data

SIMATIC CFU PA bundle with push-in terminals Comprising: • SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0 pre-assembled and tested	**6ES7655-5PX11-1XX0**
SIMATIC CFU PA bundle with aluminum enclosure Comprising: • SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0 • Aluminum enclosure with cable glands, shield busbar, shield connection clamps pre-assembled and tested	**6ES7655-5PX11-1AX0**

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Technical specifications

Article number	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing	6ES7655-5PX11-1XX0 SIMATIC CFU PA
General information		
Product type designation	PA Bundle	CFU PA
Number of channels	16	16
Product function		
• I&M data	Yes; I&M0 to I&M4	Yes; I&M0 to I&M3
• Isochronous mode	No	No
• The user can configure digital channels as input/output as required	Yes	Yes
• Digital channels can be parameterized	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V19 Update 2	V19 Update 2
• STEP 7 configurable/integrated from version	STEP 7 V5.7.1.4	STEP 7 V5.7.1.4
• PCS 7 configurable/integrated from version	V9.1 SP2 UC7	V9.1 SP2 UC7
• PROFIBUS from GSD version/GSD revision	- / -	- / -
• PROFINET from GSD version/GSD revision	GSDML V2.43 2024.03.08	GSDML V2.43 2024.03.08
Operating mode		
• DI		Yes
• Counter	Yes	Yes
• DQ		Yes
Installation type/mounting		
Mounting		on 35 mm DIN rail, 2 spacing units wide
Mounting position	Horizontal, vertical	Horizontal, vertical
Recommended mounting position	horizontal set up	
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Short-circuit protection	Yes	Yes
redundant power supply	Yes	Yes
Mains buffering		
• Mains/voltage failure stored energy time	5 ms; Bridging for field devices and communication	5 ms; Bridging for field devices and communication
Input current		
Current consumption (rated value)	2.5 A	2.5 A
Current consumption, max.	2.55 A	2.55 A
Inrush current, max.	8 A	8 A
I^2t	0.3 $A^2 \cdot s$	0.3 $A^2 \cdot s$
Encoder supply		
Number of outputs	8	8
Output voltage, min.	18.2 V	18.2 V
Short-circuit protection	Yes; Electronic	Yes; Electronic
Output current		
• up to 60 °C, max.	2 A	2 A
• up to 70 °C, max.	1 A	1 A
Power loss		
Power loss, typ.	8.2 W; Depending on the type of BusAdapter used (typ. RJ45)	8.2 W; Depending on the type of BusAdapter used (typ. RJ45)
Address area		
Address space per station		
• Address space per station, max.	1 440 byte; Dependent on configuration	1 440 byte; Dependent on configuration
Digital inputs		
Number of digital inputs	8	8
Digital inputs, parameterizable		Yes
Sourcing/sinking input	Yes; P-reading	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	No

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Technical specifications (continued)

Article number	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing	6ES7655-5PX11-1XX0 SIMATIC CFU PA
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Pulse extension	No	No
Number of simultaneously controllable inputs		
- horizontal installation		
- up to 60 °C, max.	8; Total current must be observed, see DQ	8; Total current must be observed, see DQ
- up to 70 °C, max.	8; Total current must be observed, see DQ	8; Total current must be observed, see DQ
- vertical installation		
- up to 60 °C, max.	8; Total current must be observed, see DQ	8; Total current must be observed, see DQ
Digital input functions, parameterizable		
• Counter	Yes	Yes
- Number, max.	1	1
- Counting frequency, max.	1 kHz	1 kHz
- Counting width	32 bit	32 bit
- Counting direction up/down	Yes; Up	Yes; Up
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.5 mA; Typical	2.5 mA; Typical
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	No	No
- at "0" to "1", max.	3.2 ms; for counter function 0,1 ms	3.2 ms; for counter function 0,1 ms
- at "1" to "0", max.	3.2 ms; for counter function 0,1 ms	3.2 ms; for counter function 0,1 ms
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	8	8
Current-sinking	No	No
Current-sourcing	Yes	Yes
Short-circuit protection	Yes	Yes
• Response threshold, typ.	0.7 to 1.3 A	0.7 to 1.3 A
Open-circuit detection		Yes
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.		0.5 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• Type of output voltage	DC	DC
• for signal "1", min.	Ue minus 1 V	Ue minus 1 V
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA
Output delay with resistive load		
• "0" to "1", max.	50 µs	50 µs
• "1" to "0", max.	100 µs	100 µs
Parallel switching of two outputs		
• for uprating	No	No

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Technical specifications (continued)

Article number	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing	6ES7655-5PX11-1XX0 SIMATIC CFU PA
• for redundant control of a load	No	No
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A	0.5 A
- horizontal installation		
- up to 60 °C, max.		2 A
- up to 70 °C, max.		1 A
- vertical installation		
- up to 60 °C, max.		2 A
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interfaces		
Number of PROFINET interfaces	1	1
Number of PROFIBUS interfaces	0	0
PROFIBUS PA		
• Transmission rate, max.	31.25 kbit/s	31.25 kbit/s
• Number of connectable PA field devices	8; electrically isolated from other interfaces, isolation tested at 2 500 V DC	8; isolated between power supply and PROFINET interface
• Current output to PA field devices, max.	320 mA	320 mA
• permissible current per spur line	40 mA	40 mA
• Automatic addressing	Yes	Yes
• System-supported integration of field devices via PA profiles	Yes	Yes
• Extended fieldbus diagnostics	Yes	Yes
1. Interface		
Interface type	PROFINET	PROFINET
Isolated	Yes	Yes
Interface types		
• Number of ports	2	2; via BusAdapter
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes	Yes
Protocols		
• PROFINET IO device	Yes	Yes
• PROFIBUS DP device	No	No
• Media redundancy		Yes; as MRP client
Interface types		
RJ 45 (Ethernet)		
• 100 Mbps	Yes	Yes
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET IO Device		
- Services		
- Shared device		No
Redundancy mode		
• PROFINET system redundancy (S2)	Yes; Type S2	Yes; Type S2
- Media redundancy		

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Technical specifications (continued)

Article number	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing	6ES7655-5PX11-1XX0 SIMATIC CFU PA
- MRP	Yes	Yes
Open IE communication		
• LLDP	Yes	Yes
Interrupts/diagnostics/status information		
Status indicator	Yes	Yes
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm		Yes
• Maintenance interrupt		Yes
• Limit value alarm		Yes
• Hardware interrupt		Yes
Diagnoses		
• Monitoring the supply voltage		Yes
• Monitoring of encoder power supply	Yes	
• Wire break	Yes	Yes
• Short-circuit	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes; green/red LED
• Channel status display		Yes; green/red LED
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
• Connection display LINK TX/RX		Yes; 2x green LEDs on BusAdapter
• Spur line status/fault	Yes	Yes
Potential separation		
between the channels and PROFINET	Yes	Yes
Potential separation digital inputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Potential separation digital outputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP66	IP20
Ambient conditions		
Ambient temperature during operation		
• min.		-40 °C
• max.		70 °C
Connection method		
Design of electrical connection	Connection plug	Connection plug
Spur line		
• Number of spur lines	8	8
• Type of cable	Type A	Type A
• Cable diameter, min.	6 mm	6 mm
• Cable diameter, max.	12 mm	12 mm
• Conductor cross-section, min.	0.2 mm²	0.2 mm²
• Conductor cross-section, max.	2.5 mm²	2.5 mm²
• Cable length, max.	120 m	120 m
• total current output to field devices, max.	320 mA	320 mA
• Number of connectable field devices	8	8
• Current limitation per field device, max.	40 mA	40 mA
• No-load voltage, max.	15.3 V	15.3 V

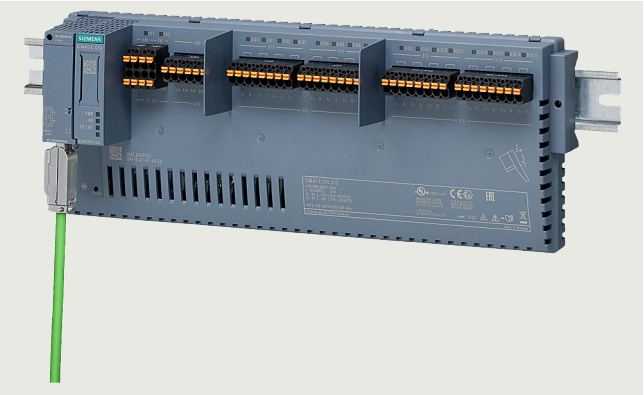
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Technical specifications (continued)

Article number	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing	6ES7655-5PX11-1XX0 SIMATIC CFU PA
• short-circuit proof	Yes	Yes
• Short-circuit current (test current); max.	8 mA	8 mA
• intrinsically safe according to FISCO model	Yes	Yes
• Debounce logic	Yes	Yes
Dimensions		
Width	414 mm	329 mm
Height	266 mm	123 mm
Depth	111 mm	74 mm
Weights		
Weight, approx.	5.5 kg	650 g

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Overview



SIMATIC CFU DIQ edition

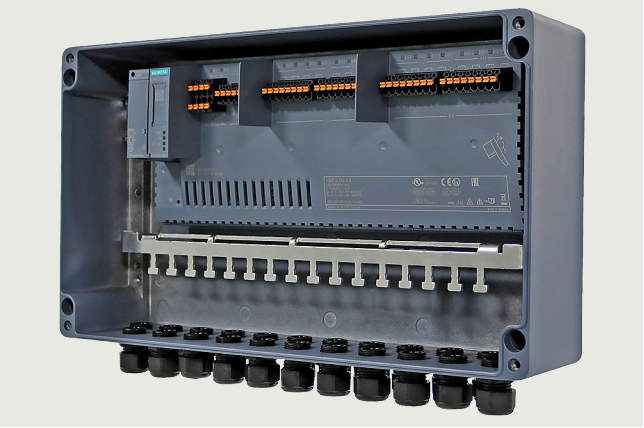
Individual, customer-specific solutions and flexible system/plant extensions are requirements that are becoming increasingly important in the process industry due to digitalization. SIMATIC CFU DIQ edition with 16 freely configurable digital IO channels offers a solution for the growing demands of distributed I/O.

SIMATIC CFU also has expansion functions for optional configuration. Two additional operating modes can be activated for selected digital inputs. "Counter" operating mode and "Frequency measurement" operating mode with a cut-off frequency of 1 kHz.

Actuator shutdown can be set for the digital outputs. The actuator shutdown of the SIMATIC CFU uses a monitoring channel (DI channel) to quickly set all digital outputs to a low digital level.

- 16 × digital inputs/outputs, freely configurable (2 x counter functionality / frequency measurement)

Aluminum field enclosure



SIMATIC CFU DIQ aluminum field enclosure, open

Overview (continued)



SIMATIC CFU aluminum field enclosure, closed

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure scope of supply:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has an inspection window for LED diagnostics.

Selection and ordering data

SIMATIC CFU DIQ with aluminum housing Comprising: • SIMATIC CFU DIQ, Article No. 6ES7655-5PX31-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0 • Aluminum housing with cable glands, shield busbar, shield connection clamp pre-assembled and tested	**6ES7655-5PX31-1AX0**
SIMATIC CFU DIQ Comprising: • SIMATIC CFU DIQ, Article No. 6ES7655-5PX31-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX31-1XX0 pre-assembled and tested	**6ES7655-5PX31-1XX0**

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Technical specifications

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
General information		
Product type designation	DIQ with aluminum enclosure	CFU DIQ
Number of channels	16	16
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
• The user can configure digital channels as input/output as required	Yes	Yes
• Digital channels can be parameterized	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V19 Update 2	V19 Update 2
• STEP 7 configurable/integrated from version	STEP 7 V5.7.1.4	STEP 7 V5.7.1.4
• PCS 7 configurable/integrated from version	V9.1 SP2 UC7	V9.1 SP2 UC7
• PROFIBUS from GSD version/GSD revision	- / -	- / -
• PROFINET from GSD version/GSD revision	GSDML V2.43 2024.02.08	GSDML V2.43 2024.02.08
Operating mode		
• DI		Yes
• Counter	Yes	Yes
• DQ		Yes
Installation type/mounting		
Mounting	For horizontal and vertical mounting	on 35 mm DIN rail, 2 spacing units wide
Mounting position	Horizontal, vertical	Horizontal, vertical
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Short-circuit protection	Yes	Yes
redundant power supply	Yes	Yes
Mains buffering		
• Mains/voltage failure stored energy time	5 ms; For communication	5 ms; For communication
Input current		
Current consumption (rated value)	5.12 A	5.12 A
Current consumption, max.	5.13 A	5.13 A
Inrush current, max.	4.8 A	4.8 A
I^2t	0.073 $A^2 \cdot s$	0.073 $A^2 \cdot s$
Encoder supply		
Number of outputs	16	16
Output voltage, min.	18.2 V	18.2 V
Short-circuit protection	Yes; Electronic	Yes; Electronic
Output current		
• up to 60 °C, max.	5 A	5 A
• up to 70 °C, max.	4 A	4 A
Power loss		
Power loss, typ.	2.88 W; Depending on the type of BusAdapter used (typ. RJ45)	2.88 W; Depending on the type of BusAdapter used (typ. RJ45)
Address area		
Address space per station		
• Address space per station, max.	1 440 byte; Dependent on configuration	1 440 byte; Dependent on configuration
Digital inputs		
Number of digital inputs	16	16
Digital inputs, parameterizable		Yes
Sourcing/sinking input	Yes; P-reading	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Pulse extension	No	No

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Technical specifications (continued)

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
Number of simultaneously controllable inputs		
- horizontal installation		
- up to 60 °C, max.	16; Total current must be observed, see DQ	16; Total current must be observed, see DQ
- up to 70 °C, max.	16; Total current must be observed, see DQ	16; Total current must be observed, see DQ
- vertical installation		
- up to 60 °C, max.	16; Total current must be observed, see DQ	16; Total current must be observed, see DQ
Digital input functions, parameterizable		
• Counter	Yes	Yes
- Number, max.	2	2
- Counting frequency, max.	1 kHz	1 kHz
- Counting width	32 bit	32 bit
- Counting direction up/down	Yes; Up	Yes; Up
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.5 mA; Typical	2.5 mA; Typical
Input delay (for rated value of input voltage)		
- for standard inputs		
- parameterizable	No	No
- at "0" to "1", max.	3.2 ms; for counter function 0,1 ms	3.2 ms; for counter function 0,1 ms
- at "1" to "0", max.	3.2 ms; for counter function 0,1 ms	3.2 ms; for counter function 0,1 ms
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	16
Current-sinking	No	No
Current-sourcing	Yes	Yes
Short-circuit protection	Yes	Yes
• Response threshold, typ.	0.7 to 1.3 A	0.7 to 1.3 A
Open-circuit detection		Yes
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.		0.5 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• Type of output voltage	DC	DC
• for signal "1", min.	Ue minus 1 V	Ue minus 1 V
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA
Output delay with resistive load		
• "0" to "1", max.	50 µs	50 µs
• "1" to "0", max.	100 µs	100 µs
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	No	No
Switching frequency		

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Technical specifications (continued)

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A	0.5 A
- horizontal installation		
- up to 60 °C, max.	5 A	5 A
- up to 70 °C, max.	4 A	4 A
- vertical installation		
- up to 60 °C, max.	5 A	5 A
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interfaces		
Number of PROFINET interfaces	1	1
Number of PROFIBUS interfaces	0	0
1. Interface		
Interface type	PROFINET	PROFINET
Isolated	Yes	Yes
Interface types		
• Number of ports	2	2; via BusAdapter
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes	Yes
Protocols		
• PROFINET IO device	Yes	Yes
• PROFIBUS DP device	No	No
• Media redundancy		Yes; as MRP client
Interface types		
RJ 45 (Ethernet)		
• 100 Mbps	Yes	Yes
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET IO Device		
- Services		
- Shared device		No
Redundancy mode		
• PROFINET system redundancy (S2)	Yes; Type S2	Yes; Type S2
- Media redundancy		
- MRP	Yes	Yes
Open IE communication		
• LLDP	Yes	Yes
Interrupts/diagnostics/status information		
Status indicator	Yes	Yes
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm		Yes
• Maintenance interrupt		Yes
• Limit value alarm		Yes

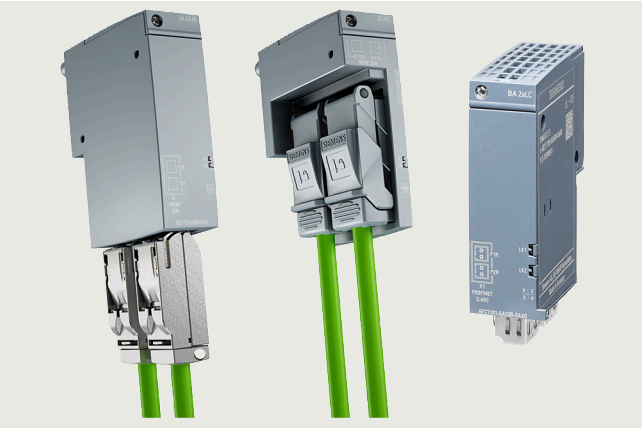
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Technical specifications (continued)

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
• Hardware interrupt		Yes
Diagnoses		
• Monitoring the supply voltage		Yes
• Monitoring of encoder power supply	Yes	
• Wire break	Yes	Yes
• Short-circuit	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes; green/red LED
• Channel status display		Yes; green/red LED
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
• Connection display LINK TX/RX		Yes; 2x green LEDs on BusAdapter
Potential separation		
between the channels and PROFINET	Yes	Yes
Potential separation digital inputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Potential separation digital outputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP66	IP20
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	60 °C	70 °C
Connection method		
Design of electrical connection	Connection plug	Connection plug
Dimensions		
Width	414 mm	329 mm
Height	266 mm	123 mm
Depth	111 mm	74 mm
Weights		
Weight, approx.	5.5 kg	610 g

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Overview



BA 2×RJ45, 2×FC and 2×LC BusAdapter

BusAdapters

A BusAdapter as a separate component allows a free choice of SIMATIC CFU connection to PROFINET:

- BA 2×RJ45:
  2 electrical connections for bus cables with standard RJ45 connectors
- BA 2×FC:
  2 electrical connections for direct connection of FastConnect bus cable
- BA 2×LC:
  2 optical ports for fiber-optic cables
- BA 1×LC, 1×RJ45:
  Mixed BusAdapter 1 optical connection and 1 electrical connection standard RJ45
- BA 1×LC, 1×FC:
  Mixed BusAdapter 1 optical connection and 1 electrical connection for direct connection of FastConnect bus cable
- BA 2×RJ45 VD:
  2 electrical connections for Ethernet communication via 2-, 4- or 8-wire copper cables and distances up to 500 m

Selection and ordering data

BusAdapters	
BA 2×RJ45 BusAdapter 2 × RJ45 connections for PROFINET (standard Ethernet socket)	**6DL1193-6AR00-0AA0**
BA 2×FC BusAdapter 2 × FastConnect (FC) connections for PROFINET	**6DL1193-6AF00-0AA0**
BA 2×LC BusAdapter 2 × glass fiber-optic connections	**6DL1193-6AG00-0AA0**
BA LC/RJ45 BusAdapter 2 × glass fiber-optic connections	**6DL1193-6AG20-0AA0**
BA LC/FC BusAdapter 2 × glass fiber-optic connections	**6DL1193-6AG40-0AA0**
BA 2×RJ45 (VD) BusAdapter 2 × electrical connections for Ethernet communication via 2, 4 or 8-wire copper cables and distances up to 500 m	**6GK5991-2VA00-8AA2**
BA 2xLC-LD BusAdapter 2 × LC-LD port, for single-mode glass fiber-optic, up to max. 20 km	**6ES7193-6AG50-0AA0**
BA LC-LD/RJ45 BusAdapter 1 × LC-LD port, for single-mode fiber-optic, up to max. 20 km, 1 × RJ45 port	**6ES7193-6AG60-0AA0**

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Technical specifications

Article number	6ES7193-6AG50-0AA0 SIMATIC Busadapter BA 2xLC-LD	6ES7193-6AG60-0AA0 SIMATIC Busadapter BA LC-LD/RJ45
General information		
Product type designation	BA 2x LC-LD	BA LC-LD / RJ45
Interfaces		
Number of PROFINET interfaces	1; 2 ports (switch) 2x LC-LD single-mode fiber-optic cable	1; 2 ports (switch) LC-LD / RJ45
Supports protocol for PROFINET IO		
• Number of RJ45 ports		1
• Number of LC ports	2; wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-LX	1; wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-LX
- Cable length		
- Cu conductors		100 m
- single-mode fiber-optic cable 9/125 µm	20 km; 10 km for topology or IRT configuration; min. transmit power -15 dB, min. receiver sensitivity -28 dB	20 km; 10 km for topology or IRT configuration; min. transmit power -15 dB, min. receiver sensitivity -28 dB
Ambient conditions		
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions		
Width	20 mm	20 mm
Height	69.5 mm	69.5 mm
Depth	59 mm	59 mm
Weights		
Weight, approx.	40 g	32 g

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11/6	STEP 7 Basic (TIA Portal)
11/8	STEP 7 Professional (TIA Portal)
11/12	STEP 7 (TIA Portal) options
11/12	SIMATIC STEP 7 CFC (TIA Portal)
11/14	STEP 7 Safety (TIA Portal)
11/16	S7-PLCSIM Advanced
11/17	ODK 1500S
11/18	SIMATIC Target for Simulink
11/20	SIMATIC Safe Kinematics
11/21	SIMATIC Kinematics Operate
11/22	SIMATIC Motion Interpreter
11/23	S7-1500T Motion Control KinPlus
11/24	PID Professional (TIA Portal)
11/25	SIMATIC TPCamGen technology package
11/26	OPC UA S7-1200/S7-1500
11/28	TIA Portal options
11/28	TIA Portal Multiuser Engineering
11/29	TIA Portal Test Suite
11/30	TIA Portal Cloud Connector
11/31	TIA Portal Teamcenter Gateway
11/32	TIA Portal CAx Publication Tools
11/33	SIMATIC Visualization Architect
11/34	SIMATIC ProDiag
11/35	SIMATIC Modular Application Creator
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11/46	Basic software and editors
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11/64	SIMATIC S7 F Systems
11/65	SIMATIC S7 Safety Matrix
11/68	Software redundancy
11/69	Options for diagnostics and service
11/69	S7-PDIAG
11/70	Options for technology and drive systems
11/70	Loadable function blocks
11/70	Standard PID Control
11/72	Modular PID Control
11/76	PID Self-Tuner
11/78	D7-SYS
11/79	Drive ES engineering software
11/81	**Software for robotics**
11/81	SIMATIC Robot Library
11/82	SIMATIC Robot Simulator
11/83	SIMATIC Cartesian Portal
11/84	SIMATIC Robot Pick AI
11/85	**Software for common tasks**
11/85	For network planning/commissioning
11/85	PROFINET Asset Management PRONETA Professional
11/86	For maintenance
11/86	SIMATIC Automation Tool
11/88	SIMATIC PDM
11/94	For administration
11/94	Central user management (UMC)
11/95	SIMATIC Version Cross Manager
11/96	Version Trail
11/97	**Industrial AI**
11/97	Introduction
11/98	Applications
11/98	SIMATIC Robot Pick AI
11/99	**Machine Vision**
11/99	Visual Inspection
11/99	Inspekto
11/105	Visual Inspection Cockpit

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Overview

Software types

Every software subject to a license is assigned to a type.
The following software types are defined:

- Engineering software
- Runtime software

Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning, or servicing. Data generated with Engineering software or executable programs can be duplicated for your own use or for use by third parties free-of-charge.

Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.
The duplication of the Runtime software or executable programs created with the Runtime software for your own use or for use by third parties is subject to a charge. You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.
Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery of the Runtime software can be found in the accompanying readme files.

License types

Siemens Digital Industries and Smart Infrastructure offers different types of licenses for software:

- Floating license
- Single license
- Rental license
- Rental floating license
- Trial license
- Demo license
- Demo floating license

Floating license

The software may be installed by the licensee for internal use on any number of devices. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started. One license is required for each concurrent user.

Single license

Unlike the floating license, only one installation of the software is permitted per license. The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include, for example, per instance, per axis, per channel, etc.
One single license is required for each type of use defined.

Rental license

The rental license supports the "sporadic use" of Engineering software. Once the license key has been installed, the software can be used for a defined time (the operating hours do not have to be consecutive). One license is required for each installation of the software.

Rental floating license

The rental floating license corresponds to the rental license; however, a license is not required for each installation of the software. Instead, one license per object (e.g. user or device) is required.

Overview (continued)

Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Demo license

A demo license supports "sporadic use" of the Engineering software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license. Once the license key has been installed, the software can be used for a defined time (the operating hours do not have to be consecutive).
One license is required for each installation of the software.

Demo floating license

The demo floating license corresponds to the demo license; however, a license is not required for each installation of the software. Instead, one license per object (e.g. user or device) is required.

Certificate of License (CoL)

The CoL is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Available versions

Software is constantly being updated. The delivery versions

- PowerPack
- Upgrade

can be used to access these updates.

Existing bug fixes are supplied with the ServicePack delivery version.

PowerPack

PowerPacks are conversion packages used to upgrade to more powerful software.

The licensee receives a new license agreement and Certificate of License (CoL) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.
A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade

An upgrade allows a newer, available version of the software to be used under the condition that a license for a previous version has already been acquired. The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous version, proves that the new software is licensed.
A separate upgrade must be purchased for each original license of the software to be upgraded.

ServicePack

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Digital Industries and Smart Infrastructure offers software products with and without license keys.
The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, floating license, etc.)
The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Software Update Service (SUS)

Within the framework of the SUS contract, you are provided with all software updates for the relevant product at no cost over a period of

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Overview (continued)

one year from the date of invoice. The contract is automatically extended by a further year unless canceled three months before expiration.

The prerequisite for agreeing to an SUS is the presence of the current version of the relevant software.

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Overview

- Service for automatic dispatch of all new software versions during contract lifetime
- Reduced logistics effort thanks to automatic contract extension
- Reduced costs as updates are provided free of charge

Ordering

- The Software Update Service is ordered in the same way as any other product. The corresponding order number is given in the ordering information of the software product in question.
- You must own the current version of the software.
- One Software Update Service is ordered for each software license installed.
- The Software Update Service runs for 1 year from date of order.
- It is extended automatically by a further year in each case, as long as it is not canceled 3 months before it expires.
- An annual lump sum is invoiced per license.

Application

SIMATIC Software is continuously enhanced and improved. The **Software Update Service** (previously: software maintenance service) is the easiest way to regularly take advantage of these improvements. It ensures automatic delivery of all new software versions that are released after ordering the Software Update Service so that your software is always up to date.

The Software Update Service

- Saves time and effort:
  Once it is ordered, the Software Update Service is automatically renewed every year.
- Lowers costs:
  The service pays for itself after the first update as it costs less than an individually ordered update.
- Makes budgeting easier:
  Software expenditures can be accounted for early in the budgeting process and they are easier to write off.

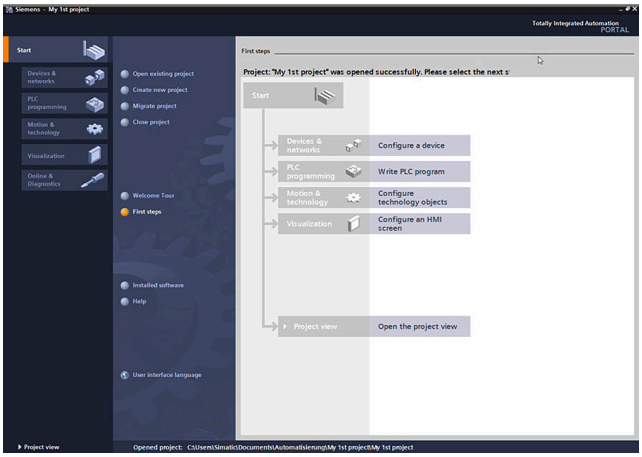
Design

Scope of supply

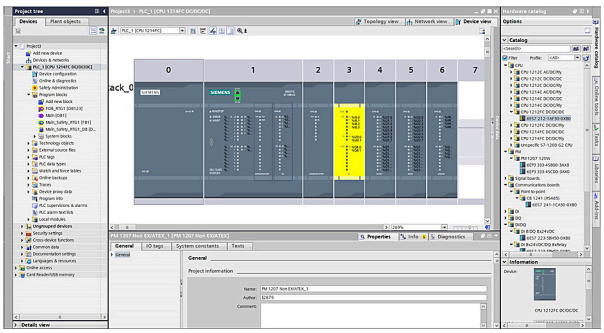
- All new software versions that are released after ordering the Software Update Service (usually several deliveries per year)
- CD-ROM SIMATIC Customer Support Knowledge Base with FAQs, tips & tricks and downloads (several times per year).

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Overview



STEP 7 Basic V21 (TIA Portal), portal view



STEP 7 Basic V21 (TIA Portal), device view: Configuring and parameterizing in realistic photo-quality representation

Intuitive, efficient and future-oriented - the engineering software for programming SIMATIC Controllers

SIMATIC STEP 7 Basic V21 is the engineering system for the SIMATIC S7-1200.

STEP 7 Basic V21 is based on the Totally Integrated Automation Portal (TIA Portal) central engineering framework which offers users a uniform, efficient and intuitive solution to all automation tasks.

Overview (continued)

New with V21

- STEP 7 V21 provides an extended range of functions of SIMATIC SD (SIMATIC Source Documents). With this conversion format, engineering objects from TIA Portal in text format can be used platform-independently. As the boundaries between OT (operational technology) and IT (information technology) become increasingly blurred, SIMATIC SD offers decisive advantages. It makes mechanisms from industrial production usable in the world of software development. For the PLC program code, the conversion format opens up new possibilities:
  - Compatibility and versioning capability:
    The converted format ensures compatibility across different software versions (from TIA Portal V20 onwards) and makes it easier to track changes.
  - Integration into version control systems such as Git:
    SIMATIC SD supports teamwork and promotes a consistent development process by integrating common version control systems.
  - Automation of engineering workflows:
    The converted files can be opened with any text editor. This increases efficiency by automating recurring tasks and accelerating development processes.
  - Use of external comparison tools:
    The files in text format enable precise analyses, which supports the optimization of control projects.
- Global search - additional filters for program blocks:
  Additional filter options for code and interfaces simplify the search for variables and signals that are used in the code, for example. This simplifies signal tracking across block boundaries.
- The maximum number of lines that can be displayed in a data block has been increased from 40,000 to 60,000 lines.

More information on the new functions of STEP 7 V21 is available at this link.

Licensing

- STEP 7 Basic V21 is supplied with a floating license. The floating license allows the software to be used on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- With the STEP 7 Basic V21 license, the following products can also be used:
  - STEP 7 Safety Basic V21 for configuration and programming of the fail-safe S7-1200 controllers
  - S7-PLCSIM V21 for simulation of S7-1200 controllers
  - WinCC Unified Basic V21 for configuration of SIMATIC Unified Basic Panels
- Existing STEP 7 Basic licenses of versions V11-20 can be upgraded to V20. This requires an upgrade license.
- The STEP 7 Basic V20 license can be upgraded to a STEP 7 Professional V21 license with a PowerPack.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

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Selection and ordering data

STEP 7 Basic V21 **Target system:** SIMATIC S7-1200, S7-1200 G2 **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (for Basic edition only) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
STEP 7 Basic V21, floating license	**6ES7822-0AA25-0YA5**
STEP 7 Basic V21, floating license, software download including license key[1] Consignee email address required for delivery	**6ES7822-0AE25-0YA5**
Upgrade from STEP 7 Basic V11...V20 to STEP 7 Basic V21, floating license	**6ES7822-0AA25-0YE5**
Upgrade from STEP 7 Basic V11...V20 to STEP 7 Basic V21, floating license, software download including license key[1] Consignee email address required for delivery	**6ES7822-0AE25-0YE5**
PowerPack STEP 7 Basic V19...V21 to STEP 7 Professional V19...V21, floating license, software download including license key[1] Consignee email address required for delivery	**6ES7822-1AE23-0YC5**
Software Update Service For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 3 months prior to expiration. Requires the current software version	
Software Update Service (Standard Edition)[2] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 USB flash drives, etc.)	
• STEP 7 Basic	**6ES7822-0AA00-0YL0**
Software Update Service (Compact Edition)[2] The delivery items are combined. For multiple contracts, only one package containing one USB flash drive with the respective installation media and the corresponding number of licenses, as well as the corresponding number of COLs, will be supplied. Delivery items to be combined must be ordered as one item.	
• STEP 7 Basic	**6ES7822-0AA00-0YM0**
Software Update Service (Download)[2] Upgrades and Service Packs are available for downloading. Consignee email address required for delivery	
• STEP 7 Basic	**6ES7822-0AE00-0YY0**

[1] Up-to-date information and download availability can be found at this link.

Selection and ordering data (continued)

[2] For more information see Software Update Service.

Technical specifications

	STEP 7 Basic V21 (TIA Portal)
Type of license	Floating license
Software class	A
Current version	V21
Target system	SIMATIC S7-1200, S7-1200 G2
Operating systems	Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Home Version 24H2 (only for Basic edition) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation)
Recommended PC hardware	
Computer	SIMATIC IPC MD-57A (successor of the Field PG M6) or comparable PC
Processor	Intel® Core™ i5 -12600HE processor (16 threads, 18 MB cache, up to 4.50 GHz)
RAM	16 GB or more (min. 8 GB, 32 GB for large projects)
Hard disk	SSD with at least 50 GB storage space available
Network	1 Gbit (for multi-user)
Screen	15.6" Full HD display (1920 x 1080 or higher)

Compatibility with other products and operating systems

STEP 7 V21 can be installed on a PC in parallel with other versions of STEP 7 V13 SP2 to V20, STEP 7 V5.6 or higher. More information on compatibility is available at this link.

As of TIA Portal project version V14, projects can be directly upgraded to V21. Projects from versions V11 to V13 must first be upgraded to V13 SP1 or SP2 (last update recommended). After that, the projects can be upgraded to a project version (V14 - V20) that can be upgraded to V21.

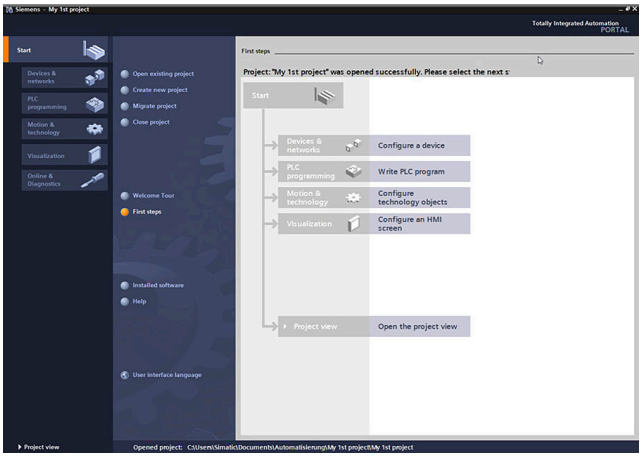
Important note

TIA Portal project versions V14..V20 are upgraded to project version V21 with TIA Portal V21. If you need to edit a TIA Portal project version V11 .. V20, we recommend an additional installation of the corresponding software to TIA Portal V21. The license purchased for V21 is also valid for all older TIA Portal versions.

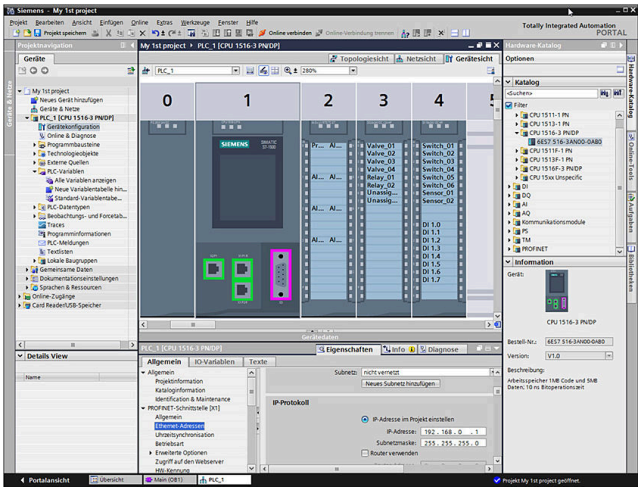
The migration of projects from STEP 7 V5.x (Classic), WinCC flexible, WinCC V7, and integrated projects is no longer supported by TIA Portal V21 (or later). To use a project with TIA Portal V21 (or later), you can migrate the project using Migration Tool and TIA Portal V20 (or earlier).

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Overview



STEP 7 Professional V21 (TIA Portal), portal view



STEP 7 Professional V21 (TIA Portal), device view: Configuring and parameterizing in realistic photo-quality representation

Intuitive, efficient and future-oriented - the engineering software for programming the SIMATIC Controllers

SIMATIC STEP 7 Professional V21 is the engineering system for the SIMATIC S7-1200, S7-1500, S7-300, S7-400 Controllers, WinAC and Software Controllers.

STEP 7 V21 is based on the Totally Integrated Automation Portal (TIA Portal) central engineering framework which offers users a uniform, efficient and intuitive solution to all automation tasks.

Overview (continued)

New in V21

- STEP 7 V21 provides an extended range of functions of SIMATIC SD (SIMATIC Source Documents). With this conversion format, engineering objects from TIA Portal in text format can be used platform-independently. As the boundaries between OT (operational technology) and IT (information technology) become increasingly blurred, SIMATIC SD offers decisive advantages. It makes mechanisms from industrial production usable in the world of software development. For the PLC program code, the conversion format opens up new possibilities:
  - Compatibility and versioning capability:
    The converted format ensures compatibility across different software versions (from TIA Portal V20 onwards) and makes it easier to track changes.
  - Integration into version control systems such as Git:
    SIMATIC SD supports teamwork and promotes a consistent development process by integrating common version control systems.
  - Automation of engineering workflows:
    The converted files can be opened with any text editor. This increases efficiency by automating recurring tasks and accelerating development processes.
  - Use of external comparison tools:
    The files in text format enable precise analyses, which supports the optimization of control projects.
- Loading without reinitializing the actual values - even with structural changes to data blocks:
  When loading into the device, the "Preview Load" dialog now offers the "Keep actual values" action. The new action allows you to make structural changes to data blocks and load them into the device without reinitializing the actual values of all variables.
- Global search - additional filters for program blocks:
  Additional filter options for code and interfaces simplify the search for variables and signals that are used in the code, for example. This simplifies signal tracking across block boundaries.
- Named value data types:
  STEP 7 offers the following new features for programming named value data types:
  - The detail view now displays the contents of a selected named value data type
  - Variables can be controlled directly in watch tables using their descriptive values, the named values.
  - Named value data types can now be opened via the list of accessible participants (LifeList) and from a card reader (read-only).
  - Named value data types that are only available online can be opened directly from the online view of the CPU.
  - Comments on the named value data types used can be displayed in code and block interface.
  - When the name or namespace is changed, all uses in the PLC program can be updated automatically.
- The maximum number of lines that can be displayed in a data block has been increased from 40,000 to 60,000 lines.

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Overview (continued)

- Trace:
  - In addition to recording values over time, events on a Motion Control technology object can now also be recorded with a trace starting with version V9.0.
  - A long-term trace configuration can now be created directly from a long-term trace, a long-term trace measurement, a long-term project trace measurement, or a superimposed long-term trace measurement.
- PID Control:
  The new version V2.0 of the PID_Temp controller is now available.
- Name and instance label as new properties in ProDiag:
  A name and instance label can now be assigned to each monitoring function in ProDiag. This makes it easier to identify and assign monitoring functions. The new properties allow message texts to be made more informative and monitoring functions to be evaluated more specifically in MES systems.

More information on the new functions of STEP 7 V21 is available at this link.

Licenses

- STEP 7 Professional V21 is supplied with a STEP 7 Professional V21 floating license. The floating license allows the installation of the software on up to 10 computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- With the STEP 7 Professional V21 license, the following products can also be used:
  - STEP 7 Safety Basic V21 for configuration and programming of the fail-safe S7-1200 controllers
  - S7-PLCSIM V21 for the simulation of S7-1200 and S7-1500 controllers
  - WinCC Unified Basic V21 for configuration of SIMATIC Unified Basic Panels
- Existing STEP 7 Professional licenses of versions V11-20 can be upgraded to V21. This requires an upgrade license.
- The user receives a combo license when upgrading from STEP 7 V5.x. The combo license enables engineering to be performed both on the STEP 7 V5.x and the STEP 7 V21 platform.
- The STEP 7 Basic V21 license can be upgraded to a STEP 7 Professional V21 license with a PowerPack.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

STEP 7 Professional V21 **Target system:** SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC **Requirement:** Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation) **Type of delivery:** 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download	
STEP 7 Professional V21, floating license	**6ES7822-1AA25-0YA5**
STEP 7 Professional V21, floating license, software download including license key [1] Consignee email address required for delivery	**6ES7822-1AE25-0YA5**
STEP 7 Professional V21/2021 SR4 Combo, floating license	**6ES7810-5CC18-0YA5**
STEP 7 Professional V21/2021 SR4 Combo, floating license, Software download including license key [1] Consignee email address required for delivery	**6ES7810-5CE18-0YB5**
Upgrade from STEP 7 Professional V11...20 to STEP 7 Professional V21 or STEP 7 Professional V17/2021 Combo...V20/2021 SR3 Combo to V21/2021 SR4 Combo, floating license	**6ES7822-1AA25-0YE5**
Upgrade from STEP 7 Professional V11...20 to STEP 7 Professional V21 or STEP 7 Professional V17/2021 Combo...V20/2021 SR3 Combo to V21/2021 SR4 Combo, floating license Software download including license key[1] Consignee email address required for delivery	**6ES7822-1AE25-0YE5**
Upgrade from STEP 7 Professional V11/2010...V16/2017 Combo to STEP 7 Professional V21/2021 SR4 Combo, floating license	**6ES7822-1AA25-0YE3**
Upgrade from STEP 7 Professional V11/2010...V16/2017 Combo to STEP 7 Professional V21/2021 SR4 Combo, floating license; Software download including license key[1] Consignee email address required for delivery	**6ES7822-1AE25-0YE3**
PowerPack STEP 7 Professional V21 Trial 365 to STEP 7 Professional V20, floating license Only valid if ordered together with Software Update Service 6ES7 822-1AE00-0YY0 (STEP 7 Professional Vxx) Prerequisite is a STEP 7 V21 Trial 365 license. License key download [1] Consignee email address required for delivery	**6ES7822-1BE23-0YC5**
50 hours of engineering with STEP 7 Professional V21, STEP 7 Professional 2021 SR4, WinCC Professional V21 (incl. WinCC flexible 2008) and STEP 7 Safety Advanced V21 (incl. Distributed Safety V5.4), floating license Software download including license key [1] Consignee email address required for delivery	**6ES7823-1GE23-0YA5**

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Selection and ordering data (continued)

PowerPack STEP 7 Basic V19...V21 to STEP 7 Professional V19...V21, floating license, software download including license key [1] Consignee email address required for delivery	**6ES7822-1AE23-0YC5**
PowerPack & upgrade from STEP 7 V5.7 to STEP 7 Professional V21/2021 SR4 Combo, floating license Software download including license key [1] Consignee email address required for delivery	**6ES7822-1AE23-0XC5**
PowerPack & upgrade from STEP 7 V5.3...V5.6 to STEP 7 Professional V21/2021 SR4 Combo, floating license Software download including license key [1] Consignee email address required for delivery	**6ES7822-1AE23-0XC3**
Software Update Service For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 3 months prior to expiration. Requires the current software version	
Software Update Service (Standard Edition) [2] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages, 10 USB flash drives, etc.)	
• STEP 7 Professional in the TIA Portal	**6ES7822-1AA00-0YL5**
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC04-0YE2**
Software Update Service (Compact Edition) [2] The delivery items are combined. For multiple contracts, only one package containing one USB flash drive with the respective installation media and the corresponding number of licenses, as well as the corresponding number of COLs, will be supplied. Delivery items to be combined must be ordered as one item.	
• STEP 7 Professional in the TIA Portal	**6ES7822-1AA00-0YM5**
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC00-0YM2**
Software Update Service (Download) [2] Upgrades and Service Packs are available for downloading. Consignee email address required for delivery	
• STEP 7 Professional V2x	**6ES7822-1AE00-0YY0**
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC04-0YY2**
TIA Portal Cloud TIA Portal software packages for use in a virtual cloud environment without local installation. TIA Portal Cloud includes the main packages of the TIA Portal versions V15.1 and higher, as well as the most important option packages of these versions. Can only be ordered via SiePortal. Consignee email address required for delivery.	

Selection and ordering data (continued)

TIA Portal Cloud, pay-per-use (hourly). Only available via Industry Mall. Consignee email address required for delivery. For this service, the following T&Cs apply exclusively https://tiacloudservices.siemens.com/terms-and-conditions (i) Documentation and Supplemental Terms for the Subscription to free accessible services of Industry Premium Portal – Basic Services, (ii) Documentation and Supplemental Terms for the Subscription to the TIA Portal Cloud and (iii) Universal Customer Agreement.	**6ES7804-0CP41-3YA0**
TIA Portal Cloud, monthly subscription. Only available via Industry Mall. Consignee email address required for delivery. For this service, the following T&Cs apply exclusively https://tiacloudservices.siemens.com/terms-and-conditions (i) Documentation and Supplemental Terms for the Subscription to free accessible services of Industry Premium Portal – Basic Services (ii) Documentation and Supplemental Terms for the Subscription to the TIA Portal Cloud and (iii) Universal Customer Agreement.	**6ES7804-0CP41-2YA0**
TIA Portal Cloud and SITRAIN access, annual subscription. Your benefit: In addition to use of TIA Portal Cloud, you receive free access to SITRAIN access - the digital learning platform. Your engineering environment and know-how are always up to date, thanks to cloud technology anywhere at any time. Consignee email address required for delivery. The specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply exclusively	**6ES7804-0CP41-1YA0**
TIA Portal Cloud, 365-day subscription. You will receive a Certificate of Contract to unlock TIA Portal Cloud for 365 days, starting from the delivery date. This subscription ends automatically. Content: Certificate of Contract (CoC) Consignee email address required for delivery. The specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply exclusively	**6ES7804-0CP41-1YA8**

[1] Up-to-date information and download availability can be found at this link.

[2] For more information see Software Update Service.

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Technical specifications

	STEP 7 Professional V21 (TIA Portal)
Type of license	Floating license
Software class	A
Current version	V21
Target system	SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC, Software Controller
Operating systems	Windows 10 (64-bit) • Windows 10 Enterprise 21H2/2021 LTSC Windows 11 (64-bit) • Windows 11 Professional Version 24H2 • Windows 11 Enterprise 24H2 • Windows 11 Enterprise 24H2 LTSC • Windows 11 Enterprise 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation) • Windows Server 2025 Standard (full installation)
Recommended PC hardware	
Computer	SIMATIC IPC MD-57A (successor of the Field PG M6) or comparable PC
Processor	Intel® Core™ i5 -12600HE processor (16 threads, 18 MB cache, up to 4.50 GHz)
RAM	16 GB or more (32 GB for large projects)
Hard disk	SSD with at least 50 GB storage space available
Network	1 Gbit (for multi-user)
Screen	15.6" Full HD display (1920 x 1080 or higher)

Compatibility with other products and operating systems

STEP 7 V21 can be installed on a PC in parallel with other versions of STEP 7 V13 SP2 to V20 and STEP 7 V5.6. More information on compatibility is available at this link.

As of TIA Portal project version V14, projects can be directly upgraded to V21. Projects from versions V11 to V13 must first be upgraded to V13 SP1 or SP2 (last update recommended). After that, the projects can be upgraded to a previous version (V14-V20) that can be upgraded to V21.

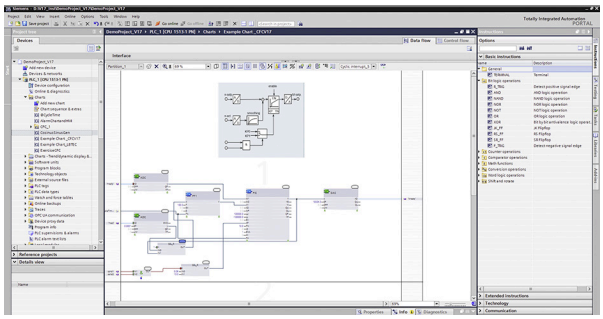
Important note

TIA Portal project versions V14.. V20 are upgraded with TIA Portal V21 to the project version V21. If you need to edit a TIA Portal project version V11 .. V20, we recommend an additional installation of the corresponding software to TIA Portal V21. The license purchased for V21 is also valid for all older TIA Portal versions.

The migration of projects from STEP 7 V5.x (Classic), WinCC flexible, WinCC V7, and integrated projects is no longer supported by TIA Portal V21 (or later). To use a project with TIA Portal V21 (or later), you can migrate the project using Migration Tool and TIA Portal V20 (or earlier).

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Overview



- Creation of automation programs by drawing a technology chart
- Minimized outlay and reduced error susceptibility due to the interconnection of ready-made blocks
- Optimal integration in the TIA Portal automation world
- Released for the standard, T, TF and R/H CPUs of the SIMATIC S7-1500 automation system
- For more information on the supported hardware, see this link.

Licensing

- SIMATIC STEP 7 CFC requires an engineering license and a runtime license for each CPU.
- Engineering license: For configuration of CFC charts, a license key needs to be installed on the PC.
- Runtime licenses: A license key is required for each PLC.
  Depending on the number of instance data blocks created during configuration with CFC, a limited or unlimited license is required:
  - A limited license allows a limited number of instance DBs to be created and loaded into the PLC.
  - With an unlimited license, any number of instance DBs can be created and loaded.

Selection and ordering data

SIMATIC STEP 7 CFC V21	
Task: Graphic configuring and programming of automation applications in the form of technology charts **Target system:** SIMATIC S7-1500 **Requirement:** STEP 7 V21 or higher **Type of delivery:** Engineering software, electronic documentation and license key on USB flash drive	
Floating license	**6ES7658-1ET25-0YA5**
Floating license for download. Email address required for delivery[2]	**6ES7658-1ET25-0YH5**
Upgrade Advanced Engineering License V20.0 to V21.0	**6ES7658-1ET25-0YE5**
Upgrade Advanced Engineering License V20.0 to V21.0 For download. Email address required for delivery[2]	**6ES7658-1ET25-0YK5**
Runtime license for 100 objects; one runtime license is required per PLC	**6ES7658-1ET00-3YH5**
Runtime license for an unlimited number of objects; one runtime license is required per PLC	**6ES7658-1ET00-4YH5**
Software Update Service (requires current software version)[1]	**6ES7658-1ET00-0YV8**

1) For more information on the Software Update Service, see Catalog section "Software for SIMATIC controllers"
2) Up-to-date information and download availability can be found under this link.

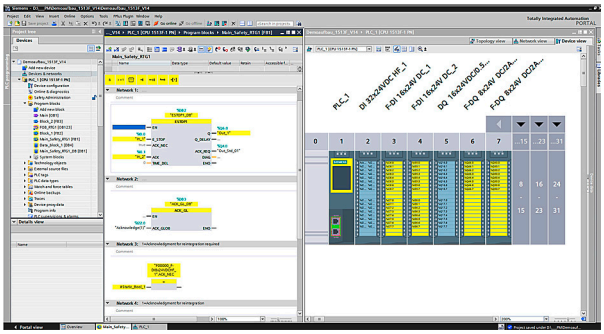
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Technical specifications

Engineering tool	**SIMATIC STEP 7 CFC**
Current version	V21.0
Software class	A
Application areas	
Can be used for	Graphical creation, interconnection and parameterization of (preconfigured) blocks and functions
Marketing message	Simply interconnect and configure instead of programming!
Advantages	• Can be used to optimum effect even during the design phase • Reduced configuration effort thanks to graphical interconnection • High degree of reusability of charts that have already been created • Quick and easy familiarization • Quick and transparent interconnection of preconfigured functions • Technological creation of the program as a whole • Clear representation of control loop structures • Comment fields with texts and images • Short commissioning time
Sectors	• Automobile engineering • Chemicals industry • Power engineering and supply • Rubber and plastics processing machines • Metalworking machines • Food and beverage machines • Petrochemicals • Rolling mills • Water industry • Coilers
Target systems	
Can be used in	S7-1500
System requirements	
Operating system	Windows 10 (64-bit) • Windows 10 Enterprise 2019 LTSC Windows 11 (64-bit) • Windows 11 Professional 22H2 and 23H2 Windows Server (64-bit) • Windows Server 2022 Standard (full installation)
Required software	SIMATIC STEP 7 V20 or higher
Properties	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	-
Integration in CFC	Yes
Program runtimes	
With S7-1500 (typical)	Depending on the interconnected blocks
Supported standards	
IEC 61131-3	Based on the IEC standard
Status of PLCopen activities	-
Available versions/licenses	
Floating license	• 1 memory stick

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Overview



STEP 7 Safety Advanced, configuration and programming

- For creating safety-related programs on the STEP 7 user interface
- For seamless and easy to use integration of safety-related functions into the standard automation
- All the required configuration and programming tools are integrated into the STEP 7 user interface and utilize a common project structure
- STEP 7 Safety Basic for parameter assignment and programming of the fail-safe S7-1200 Basic Controller. Included in STEP 7 license (no separate Safety license required)
- STEP 7 Safety Advanced option package for all fail-safe TIA SIMATIC controller classes (S7-1200, S7-1500, S7-1500 Software Controller, S7-1500V, S7-300, S7-400, WinAC)

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- STEP 7 Safety Basic is a subset of STEP 7 Safety Advanced for programming the fail-safe S7-1200 F Basic Controller.
- Combo licenses allow you to choose between programming with the predecessor product S7 Distributed Safety and STEP 7 Safety Advanced.
- An upgrade to a combo license is offered for the latest version of S7 Distributed Safety.
- Software Update Service (SUS) contracts can be concluded for STEP 7 Safety Advanced.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

STEP 7 Safety Advanced V21	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco **Requirement:** STEP 7 Professional V21 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FA25-0YA5**
Floating license for 1 user, license key for download[2]; Email address required for delivery	**6ES7833-1FA25-0YH5**
STEP 7 Safety Advanced V21 Combo	
Delivery includes STEP 7 Safety Advanced V21 and S7 Distributed Safety V5.4 SP5 Update 2	
Floating combo license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC25-0YA5**
Floating combo license for 1 user; software, documentation and license key for download[2]; Email address required for delivery	**6ES7833-1FC25-0YH5**
Software Update Service	
Software Update Service (Standard Edition) [1] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.). Requires the current software version.	**6ES7833-1FC00-0YX2**
Software Update Service (Compact Edition) [1] The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. The deliveries that are to be grouped together must be ordered as a single item. Requires the current software version. Minimum order quantity: 3 units	**6ES7833-1FC00-0YM2**
Software Update Service (Download) [1] Requires the current software version. Email address required for delivery	**6ES7833-1FC00-0YY0**
STEP 7 Safety Advanced Upgrade	
Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Upgrade from Distributed Safety V5.4 SP5 or STEP 7 Safety Advanced V11..V20 (Combo) to STEP 7 Safety Advanced V21 (Combo) for parallel use of the versions; upgrade of combo license for 1 user; license key on USB flash drive	**6ES7833-1FA25-0YF5**
Upgrade from Distributed Safety V5.4 SP5 or STEP 7 Safety Advanced V11..V20 (Combo) to STEP 7 Safety Advanced V21 (Combo) for parallel use of the versions; upgrade of combo license for 1 user; license key for download[2]; Email address required for delivery	**6ES7833-1FA25-0YY5**

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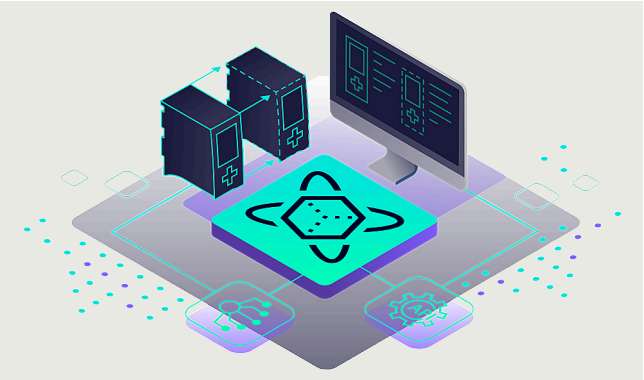
Selection and ordering data (continued)

STEP 7 Safety Advanced PowerPack	
PowerPack STEP 7 Safety Basic V19 to STEP 7 Safety Advanced V19; floating license for 1 user; license key on USB flash drive	**6ES7833-1FA23-0YC5**
PowerPack STEP 7 Safety Basic V19 to STEP 7 Safety Advanced V19; floating license for 1 user; license key for download[2]; Email address required for delivery	**6ES7833-1FA23-0YJ5**
STEP 7 Safety Basic V19	
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC **Requirement:** STEP 7 Basic V19 or higher Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Floating license for 1 user; license key on USB flash drive	**6ES7833-1FB23-0YA5**
Floating license for 1 user, license key for download[2]; Email address required for delivery	**6ES7833-1FB23-0YH5**
STEP 7 Safety Basic Upgrade	
Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
Upgrade from STEP 7 Safety Basic V13 SP1...V18 to STEP 7 Safety Basic V19 for parallel use of the versions; upgrade license for 1 user; license key on USB flash drive;	**6ES7833-1FB23-0YE5**
Upgrade from STEP 7 Safety Basic V13 SP1...V18 to STEP 7 Safety Basic V19 for parallel use of the versions; upgrade license for 1 user; license key for download[2]; Email address required for delivery	**6ES7833-1FB23-0YK5**

1) For more information see Software Update Service.
2) Up-to-date information and download availability can be found under this link.

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Overview



With SIMATIC S7-PLCSIM Advanced, digital twins can be used for simulation of SIMATIC controllers and for extensive function simulation.

The digital twins can also be tested and validated in conjunction with a plant/machine. An extensive API is available for interfacing plant/machine simulations.

Highlights of SIMATIC S7-PLCSIM Advanced V8.0

New CPU types

- The controllers of the new SIMATIC S7-1200 G2 series are now supported in addition to the S7-1500-based controllers.

Compatibility

S7-PLCSIM Advanced now supports TIA Portal projects of versions V14 to V21 and CPU firmware versions V1.8 – V4.1.

The user interface of S7-PLCSIM V21 is also intended for use with S7-PLCSIM Advanced V8.0.

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license). For each license, the use of two simultaneously started S7-PLCSIM Advanced instances is permitted.
- Users of previous versions V1.0 ... V7.0 are offered an upgrade to version V8.0.
- It makes sense to benefit from the annual improvements by signing Software Update Service (SUS) contracts.
- In addition, it is possible to purchase the software as an annual subscription.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

SIMATIC S7-PLCSIM Advanced V8.0	
Option for simulation of S7-1500 and ET 200SP	
Floating license, software, documentation, and license key on USB flash drive	**6ES7823-1FA07-0YA5**
Floating license, software, documentation and license key for download [1] Email address required for delivery	**6ES7823-1FE07-0YA5**
Upgrade	
Upgrade from SIMATIC S7-PLCSIM Advanced V1.0 ... V7.0 to V8.0, floating license	**6ES7823-1FA07-0YE5**
Upgrade from SIMATIC S7-PLCSIM Advanced V1.0 ... V7.0 to V8.0, floating license from download [1]; Email address required for delivery	**6ES7823-1FE07-0YE5**
Software Subscription Service	
SIMATIC S7-PLCSIM Advanced Subscription Download, Single License, software, documentation and license key for download [1] Email address required for delivery	**6ES7823-1FE00-0YN5**
Software Update Service[2]	
For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version.	
Software Update Service: The upgrades, Service Packs, and licenses are provided via USB flash drives.	**6ES7823-1FA00-0YL5**
Software Update Service (Download)[1] Upgrades and Service Packs are available for downloading. Email address required for delivery	**6ES7823-1FE00-0YL5**

[1] Up-to-date information and download availability can be found at this link.

[2] For more information see Software Update Service.

Technical specifications

Minimum requirements for use

Hardware / software	Requirements
Processor	• A modern multicore processor with sufficient performance • One core is occupied for each simulation instance started • At least one additional core for the operating system • For virtual machines: The required number of cores is physically required on the host system • At least one additional core for additional active applications
RAM	• At least 16 GB • Additional RAM work memory according to the requirements of the remaining active applications
Free hard disk space	20 GB
Operating systems (64-bit version)	As TIA Portal
Screen resolution	At least 1920 x 1080 (Full HD)

Compatibility with other products

- S7-PLCSIM Advanced V8.0 and S7-PLCSIM V21 can be installed and operated on the same PC or the same virtual machine. Communication between the two applications cannot be simulated.
- Compatible with TIA Portal projects from versions V14 to V21
- Support of the CPU firmware versions V1.8 to V4.1

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Overview

- For developing dynamically loadable function libraries for the S7-1500 Software Controllers and S7-1500 Advanced Controllers CPU 1518 MFP and PLCSIM Advanced:
  - Implementation of function libraries for the SIMATIC S7-1500 Software Controllers that are executed under Windows with the high-level languages C/C++, C# and VB
  - Implementation of function libraries for the PLCSIM Advanced that are executed under Windows with the high-level languages C/C++
  - Implementation of function libraries that are executed in real-time in the context of the user program of the CPU with the high-level language C++
  - Implementation of applications for the C++ runtime of the CPU 1518 MFP
- "Eclipse" development environment for real-time function libraries in the CPU user program and applications for the C++ runtime in the scope of delivery.
- Development of library functions under Windows with MS Visual Studio (optional)
- Easy introduction to development by using basic projects via templates
- Automatic creation of function blocks for calling the library functions
- Simple integration of the function blocks into STEP 7 by importing.
- Simple use of the library functions in the PLC without specific high-level language know-how.

Licensing

- ODK 1500S is supplied with a floating license. The floating license allows installation of the software on any number of computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- The integrated development environment Eclipse, required for developing real-time libraries, is included in the scope of supply of ODK 1500S as well as templates for Visual Studio.
- SIMATIC ODK 1500S is available as a standalone product or in a bundle with SIMATIC Target 1500S™ for Simulink®.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

SIMATIC ODK 1500S	
SIMATIC ODK 1500S V2.5, floating license for 1 user E-SW, software and documentation on DVD, license key on USB flash drive, Class A, 6 languages (de, en, fr, es, it, cn), runs on Windows 7, Windows 8.1 and Windows 10	**6ES7806-2CD03-0YA0**
SIMATIC ODK 1500S V2.5, floating license for 1 user E-SW, software, documentation and license key download[1], Class A, 6 languages (de, en, fr, es, it, cn), runs on Windows 7, Windows 8.1 and Windows 10 Consignee email address required for delivery	**6ES7806-2CD03-0YG0**

[1] Up-to-date information and download availability can be found at this link.

Technical specifications

System requirements

The SIMATIC ODK 1500S can be used on PC platforms with the following requirements:

- Operating systems Windows 7/8.1/10
- Min. 3 GB hard disk memory
- Min. 4 GB work memory
- Mouse, keyboard, monitor

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Overview

SIMATIC Target™ is an add-on for the Simulink®software from The MathWorks. This makes it possible to also use model-based design with MATLAB® and Simulink for SIMATIC S7-1500 Controllers and Industrial Edge from Siemens. For this purpose, executable code for all ODK-compatible S7-1500 Controllers (S7-1500 Software Controllers, ET 200SP Open Controllers, CPU 1518 ODK/MFP and PLCSIM Advanced as of V3.0) or the LiveTwin Edge app is generated directly from Simulink via SIMATIC Target.

New with V6.0

- Support for Simulink External Mode for the LiveTwin Edge app: This allows the model behavior to be observed directly on the runtime. This enables a comparison of model behavior between Simulink simulation and real-time execution on LiveTwin. In addition, External Mode allows module parameters to be adjusted directly in the runtime, thus directly influencing the runtime behavior of the model.
- "Download in RUN" also for Simulink models: The handling of the Load and Unload ODK blocks is directly included in the generated PLC blocks. This eliminates the need for a RUN/STOP transition to run the updated model in an S7-1500.
- The web visualization of the Simulink model is now based on the new PLC Web API: This means that additional DBs are no longer created in the user program for the website. In addition, no special system function calls are required. Web visualization is also possible for up to four different Simulink models simultaneously.
- Support of TIA Portal Multiuser: Code generation from a Simulink model can now be done directly in a Local Session of a TIA Portal Multiuser project.

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- SIMATIC Target™ for Simulink® V6.0 is available as a standalone product or in a bundle with the SIMATIC S7-1500 Software Controller Open Development Kit.
- An upgrade to latest versions is available for previous versions

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

SIMATIC Target (TM) for Simulink(R) V6.0 floating license download Engineering software; software, documentation and license key for download[1]; Class A; 2 languages: de, en; runs under Win10; Win11; Software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge runtime via the LiveTwin Edge app Consignee email address required for delivery	**6ES7823-1BE05-0YA5**
SIMATIC Target (TM) for Simulink(R) V6.0 Upgrade V2.0 .. V5.0 -> V6.0 floating license download Engineering software; software, documentation and license key for download[1]; Class A; 2 languages: de, en; runs under Win10; Win11; Software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge runtime via the LiveTwin Edge app Consignee email address required for delivery	**6ES7823-1BE05-0YE5**
Target + ODK 1500S bundle Contains: SIMATIC ODK 1500S V2.5 and SIMATIC Target (TM) for Simulink (R) V6.0, floating license download, E-SW, software, documentation and license key for download[1], Class A, 2 languages: de, en; runs under Win10; Win11; Software for integrating Simulink models into the S7 program of the S7-1500 SW controller / CPU1518 ODK/MFP and the Industrial Edge runtime via the LiveTwin Edge app Consignee email address required for delivery	**6ES7823-1BE15-0YA0**
SIMATIC Model Based Design 2023 PoC 90-day bundle download Contains: SIMATIC Target (TM) for Simulink (R) V6.0 SP1 PoC DL, SIMATIC ODK 1500S V2.5 PoC 90-day download, SIMATIC S7-PLCSIM Advanced V6.0 PoC 90-day download, SIMATIC STEP 7 Professional V19 PoC 90-day download, floating license download, E-SW, software, documentation and license key for download[1], Class A, 2 languages: de, en; The system requirements specification can be found at this link. Consignee email address required for delivery	**6ES7823-1BE25-0YA3**

[1] Up-to-date information and download availability can be found at this link.

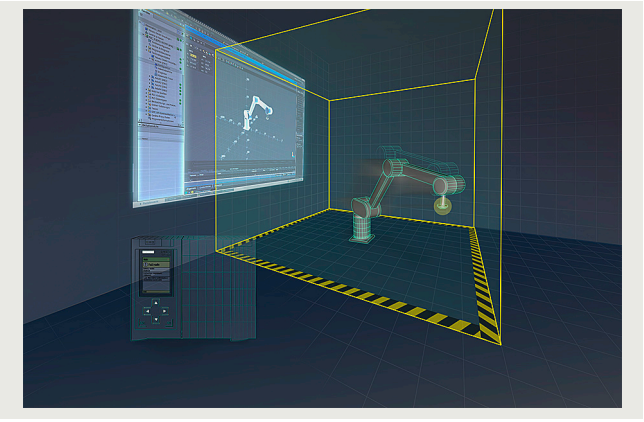
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Technical specifications

Requirements at the MATLAB end	
MATLAB 2019b (64-bit) or more recent version	• MATLAB 9.13 • MATLAB Coder 5.5 • Simulink 10.6 • Simulink Coder 9.8 • Embedded Coder 7.9 (optional) • Stateflow 10.7 (optional)
Requirements at the SIMATIC end	
SIMATIC ODK 1500S V2.0/V2.5	Must be installed together with SIMATIC Target, MATLAB and Simulink on the same PC
STEP 7 Professional as of V15.1	For configuration of the S7-1500 CPUs, not essentially on the same PC as the SIMATIC Target
Supported CPUs	• CPU 1507S(F) with firmware V2.0 or higher • CPU 1515SP PC (F) with firmware V2.0 or higher • CPU 1518 (F) ODK/MFP • S7-PLCSIM Advanced as of V3.0

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Overview



SIMATIC Safe Kinematics enables safe monitoring of the movement of predefined kinematics with up to 12 interpolating axes in Delta picker
multidimensional space. The following monitoring functions are available:

- Safe Speed Monitor:
  Safe speed monitoring can be used to monitor the Cartesian speed of individual points in the kinematics, e.g. at the tool center point or at joints.
- Safe Zone Monitor:
  Safe zone monitoring is used to monitor the position of the kinematics in the Cartesian space, e.g. to limit the traversing range of the kinematics or to monitor areas that can be entered by operating personnel.
- Safe Orientation Monitor:
  Safe orientation monitoring enables monitoring of the orientation of the flange on user-defined serial kinematics, e.g. a workpiece may only be machined if the tool is perpendicular to the floor.

The following kinematics are supported:

- Cartesian portal
- Roller picker (vertical and horizontal)
- Delta pickers
- SCARA
- Articulated arm
- User-defined serial kinematics

SIMATIC Safe Kinematics includes an engineering option package for the TIA Portal and must be subsequently installed via a setup in TIA Portal V21.
The product contains a fail-safe block library that can be integrated in the STEP 7 Safety Advanced programming environment and can be connected on the input and output side.
SIMATIC Safe Kinematics supports the following control platforms:

- S7-1500 F-CPUs
- Open Controller
- SIMATIC Drive Controller
- Software Controller
- SINUMERIK ONE

Overview (continued)

System requirements

- SIMATIC STEP 7 Professional (TIA Portal) V21
- STEP 7 Safety Advanced V21

SIMATIC Safe Kinematics requires as a subordinate drive system SINAMICS S120 with CU320-2 as of firmware V5.1 with Safety Integrated Advanced Functions.

Licensing

- The software is supplied with a Single Runtime License. A license is required for each F-CPU on which SIMATIC Safe Kinematics runs.
- The software can only be ordered via Online Software Delivery (OSD). The download contains one license certificate and the TIA Portal installation setup for SIMATIC Safe Kinematics.
- The following additional licenses are required to use SIMATIC Safe Kinematics:
  - SIMATIC STEP 7 Professional (TIA Portal) V21
  - STEP 7 Safety Advanced V21
  - SINAMICS Safety Integrated Advanced Functions (for each monitored axis of the kinematics)

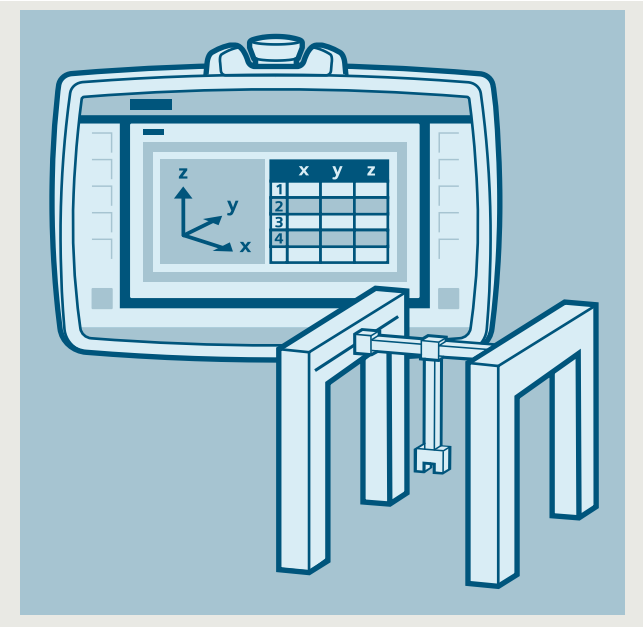
Selection and ordering data

SIMATIC Safe Kinematics	
SIMATIC Safe Kinematics V19 single Runtime license download[1)] Includes license certificate and installation setup for the block library for safe monitoring of the movement of predefined kinematics with up to 12 interpolating axes. Runs on S7-1500 (T)F-CPU (CPU 1516 FW 4.0 or higher, CPU 1517, CPU 1518) Open Controller, Drive Controller (1507D TF), Software Controller and SINUMERIK ONE with TIA Portal V21 and STEP 7 Safety Advanced V21 Consignee email address required for delivery	**6ES7823-0FE04-1AA0**

1) Up-to-date information and download availability can be found under this link.

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Overview



With SIMATIC Kinematics Operate, kinematics can be configured, programmed and operated with up to 6 positioning axes with synchronous point-to-point control (sPTP).
The Plug & Play solution comprises a convenient user interface for programming, diagnostics and operation of the kinematics via HMI.

The SIMATIC Kinematics Operate V1.0 software solution consists of a TIA Portal project and an HMI project for TIA Portal as of V15.0.

SIMATIC Kinematics Operate V1.0 contains the following HMI configuration functions:

- Configuration of kinematics and additional axes;
  6 axes are available in total for multi-axis positioning with sPTP. The axes not used in the multi-axis group can be created as independent single axes.
- Axis configuration;
  The dynamic parameters, the axis limits and the homing of the different axes can be configured.
- Tag and I/O configuration;
  Bool and Real tags can be created. Logical step enabling conditions consisting of multiple inputs and tags can be combined into one Boolean tag. Digital inputs and outputs can be configured via the I/O address.
- Points table;
  By means of input or teaching of axis positions, path points can be defined that can be used for programming the kinematics.
- Zone configuration;
  Multiple restricted zones can be created in the workspace as protection zones. These are checked cyclically against both the target coordinates and the current axis values. A violation leads to a stop response of the axes

The program editor offers the following functions:

Overview (continued)

- Synchronous point-to-point commands;
  All axes are traversed synchronously with multi-axis positioning. The destination is specified either using the points table or by direct input with optional blending.
- Single axis commands;
  the additional axes can be homed, positioned, torque-limited or speed-controlled.
- Wait functions;
  Step enabling conditions, based on a digital input, a Bool tag or a wait time, can be programmed.
- Calculate tags and assign values;
  digital outputs can be set via an input mask. In addition, floating point tags can be calculated, incremented or assigned absolute values.
- Program control structures;
  Labels, branches, loops and parallel sequences allow flexible program design.

SIMATIC Kinematics Operate can be run on SIMATIC S7-1500 CPU S7-1511T-1 PN. Alternatively, SIMATIC S7-1500 CPU S7-1512C-1 PN or a faster CPU can be used. Please refer to the operating instructions for details on scalability and the configuration limits.

System requirements

- SIMATIC STEP 7 Professional (TIA Portal) as of V15
- SIMATIC WinCC Advanced ES as of V15

Licensing

- SIMATIC Kinematics Operate is available as Runtime option for TIA Portal. A license is required for each CPU on which SIMATIC Kinematics Operate runs.
- The product can only be ordered via Online Software Delivery (OSD). The download contains the license certificate. The software is downloaded via the Siemens Industry Online Support Portal.
- The following additional licenses are required to use SIMATIC Safe Kinematics:
  - SIMATIC STEP 7 Professional (TIA Portal) as of V15
  - SIMATIC WinCC Advanced ES as of V15

Selection and ordering data

SIMATIC Kinematics Operate	
SIMATIC Kinematics Operate V1.0 single machine license download [1] Includes license certificate, programming and control of multi-axis kinematics with sPTP for 2-6 positioning axes based on a SIMATIC S7-1500 PLC from SIMATIC S7-1511T upwards Including user operating concept Consignee email address required for delivery	**6ES7823-0GE01-1AA0**

[1] Up-to-date information and download availability can be found at this link.

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Overview



The SIMATIC Motion Interpreter of the CPU S7-1500T can be used to create motion tasks for single axes, coordinated axes, and kinematics with up to six interpolating axes. The motion tasks that you want the Interpreter to perform are contained in an Interpreter program, which is part of the Motion Interpreter. The Interpreter program and the cyclic user program of the machine are separate from each other. This means that the technological production process can be implemented without interfering with the cyclical user program of the machine and can be changed during ongoing machine operation.

The Interpreter program can be validated and simulated with an integrated digital twin independently of the user program, enabling parallel development of a customer machine and a fast time-to-market.

Requirements

- TIA Portal V19 with STEP 7 Professional
- SIMATIC T-CPU (technology CPU) from FW version V3.1

Licenses

The SIMATIC Motion Interpreter is a product subject to licensing. A Runtime license is required for each technology CPU.

Selection and ordering data

SIMATIC Motion Interpreter	
Motion Interpreter basic Single Runtime license for 1 CPU Download contains license certificate without software and documentation. Executable under SIMATIC technology CPUs. TIA Portal V19 or higher is required for execution. Download product[1)] Consignee email address required for delivery	**6ES7823-0SJ00-1AA0**

1) Up-to-date information and download availability can be found at this link

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Overview



The SIMATIC S7-1500 Technology CPUs support kinematics with up to 4 interpolating axes, e.g. for handling tasks such as pick & place, assembly and palletizing.
With the Motion Control package "S7-1500T Motion Control KinPlus", this scope of functions is expanded so that kinematics with up to 6 interpolating axes can be controlled – e.g. for "oriented" handling of products by means of rotary and swivel axes.
The following additional kinematics are available with "S7-1500T Motion Control KinPlus":

- Predefined kinematics:
  - Cartesian portal 3D with 2 orientations
  - Delta picker 3D with 2 orientations
  - 6-axis articulated arm with central hand
  - 6-axis articulated arm with angular hand
- User-defined kinematics 3D with 3 orientations

Prerequisites:

- TIA Portal V18 with STEP 7 Professional
- From FW version V3.0: SIMATIC CPU 1518T(F)-4 PN/DP or CPU 1507D TF
- From FW version V4.0: SIMATIC CPU 1518T(F)-3 PN
- From FW version V4.1: SIMATIC CPU 1518T(F)-3 PN, 1517T(F)-3 PN, 1516T(F)-3 PN
- Required for each CPU:
  - Motion control package "S7-1500T Motion Control KinPlus" with up-to-date Motion Control firmware part
  - Special SIMATIC Memory Card of the type "S7-1500T Motion Control KinPlus" (available as 2 GB and as 32 GB variant)

The Motion Control package "S7-1500T Motion Control KinPlus" contains the complete Motion Control firmware part of a T-CPU and additionally the function extensions for up to 6 interpolating axes. This package must be copied to a SIMATIC Memory Card of the type "S7-1500T Motion Control KinPlus" and is loaded by the controller at runtime.

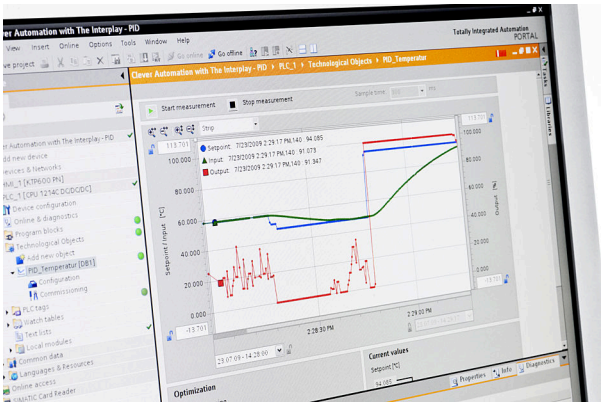
Selection and ordering data

S7-1500T Motion Control KinPlus	
S7-1500T Motion Control KinPlus Runtime software without documentation Class A runs under T-CPU 1518 T//TF-3 PN, T-CPU 1517 T//TF-3 PN, T-CPU 1516 T//TF-3 PN Download product[1] Consignee email address required for delivery The SD card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution	**6ES7823-0KE03-1AA0**
S7-1500T Motion Control KinPlus Runtime software without documentation Class A runs under T-CPU 1518 T//TF-3 PN, T-CPU 1517 T//TF-3 PN, T-CPU 1516 T//TF-3 PN Supplied on USB flash drive The SD card 6ES7 954-8LP80-0AA0 or 6ES7 954-8LT80-0AA0 is required for execution	**6ES7823-0KU03-1AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 2 GB	**6ES7954-8LP80-0AA0**
SIMATIC S7, memory card for S7-1500T Motion Control KinPlus 3.3 V flash, 32 GB	**6ES7954-8LT80-0AA0**

[1] Up-to-date information and download availability can be found at this link

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Overview



- PID Professional combines the two option packages Modular PID Control and Standard PID Control in TIA Portal.
- Permits the simple integration of continuous PID Controllers, pulse controllers and step controllers in the application program
- Can be used for simple to complex closed-loop control tasks in SIMATIC S7-300 (CPU 313 or higher), S7-400, and WinAC.
- The engineering software for PID Professional is already included in the STEP 7 package in STEP 7 V13 or higher.
- Tuning functionality by means of PID Self-Tuner (part of STEP 7 as of V11 SP1).
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The engineering software requires STEP 7 Professional. The software is part of the STEP 7 Professional DVD and/or the program download. A license key is required for activation.
- During runtime, each CPU requires its own runtime license.
- Upgrades to PID Professional (engineering license or Runtime single license) are offered for Standard PID Control/Modular PID Control from V11 onwards.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

PID Professional for TIA Portal	
SIMATIC S7 PID Professional for TIA Portal, floating license V11 or higher, Runtime single license Without software and documentation License key on USB flash drive, Class A, requires STEP 7 Professional V1x, reference hardware: S7-300/400/WinAC	**6ES7860-1XA02-0XA5**
SIMATIC S7 PID Professional Runtime single license Without software and documentation, Class A, reference hardware: S7-300/400/WinAC	**6ES7860-1XA01-0XB0**
SIMATIC S7 PID Professional license key download[1] floating license from V11 Without software and documentation, Class A, requires STEP 7 Professional V1x, reference hardware: S7-300/400/WinAC Consignee email address required for delivery	**6ES7860-1XA01-0XH5**
SIMATIC S7 PID Professional license key download[1], upgrade license Standard PID Control/ Modular PID Control V5.1 or higher -> PID Professional V11 or higher Without software and documentation, Class A, requires STEP 7 Professional V1x, reference hardware: S7-300/400/WinAC Consignee email address required for delivery	**6ES7860-1XA01-0XK5**
SIMATIC S7 PID Professional for TIA Portal, upgrade license Standard PID Control/ Modular PID Control V5.1 or higher -> PID Professional V11 or higher Runtime single license Without software and documentation License key on USB flash drive, Class A, requires STEP 7 Professional V1x, reference hardware: S7-300/400/WinAC	**6ES7860-1XA02-0XE5**

[1] Up-to-date information and download availability can be found at this link.

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Overview

The SIMATIC Software option package, TPCamGen, is used to calculate optimized motion profiles for servo presses where the tool is connected to the drive axle via a connecting rod.

When calculating the profiles, TPCamGen takes into account various constraints, e.g.:

- Maximum eccentric speed
- Maximum ram speed
- Maximum acceleration
- etc.

It minimizes the drive load at the same time.

TPCamGen is the core of the SIMATIC SimaPressServo software package and can only be used suitably in conjunction with this application software.
The SIMATIC Open Controller platform (from TPCamGen V1.1) or a Windows 10 Industrial PC (IPC) with a SIMATIC S7-15xx technology CPU (from TPCamGen V1.2) serves as runtime environment.

System requirements:

- SIMATIC STEP 7 (TIA Portal) as of V17.
- ET 200 SP Open Controller: Technology CPU 1515SP PC2 T or 1515SP PC2 TF from V21.9
  or
  any SIMATIC S7-15xx technology CPU from V2.9/V21.9 in connection with Windows 10 Industrial PC.

Licensing

- The software can only be obtained as download via Online Software Delivery (OSD). The download includes a license certificate and a ZIP file containing the Windows Installation Setup, TPCamGen function blocks for TIA Portal and the Function Manual (DE/EN).
- The software purchase includes the license for a specific servo press configuration.
- The software is additionally delivered with a Floating Runtime License. It allows the installation of the software on any number of Open Controller CPUs.
- To use the TPCamGen, a signature is additionally required, which is provided in coordination with Siemens. This signature corresponds to a technical license key and is queried each time the software package is generated in the context of the specific press solution. The signature must be stored once in the implemented solution. You will find more information in the Siemens Industry Online Support at this link.
- Note:
  You may use one software license and the associated signature for any number of presses with identical design. For a press with changed design data you need a new license, which has to be ordered separately.

Selection and ordering data

TPCamGen technology package Requirement:Runs on: Floating License Download[1]; contains license certificate, Windows Installation Setup, TPCamGen function blocks for TIA Portal and Function Manual (de/en); consignee email address required for delivery	**6ES7823-0FE30-1AA0**

[1] Up-to-date information and download availability can be found under this link.

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Overview

The vendor- and platform-independent OPC Unified Architecture (UA) is the communication standard for Industry 4.0 and is the standard mechanism for accessing SIMATIC S7-1500 and S7-1200 data from non-Siemens devices.

SIMATIC S7-1200

OPC UA Server with the following functionality:

- OPC UA Data Access, Read/Write, Subscription
- OPC UA Methods for consistent data transmission
- Modeling of the server interface or companion specifications
- Support for modern OPC UA Security Profiles (signing and encryption)
- Openness support for easy handling, e.g., via SiOME
- Diagnostic buffer entries for OPC UA server and OPC UA diagnostics in the TIA Portal

S7-1500

OPC UA Server with the following functionality:

- OPC UA Data Access, Read/Write, Subscription
- OPC UA Methods for consistent data transmission
- Simple use of OPC UA with the standard SIMATIC interface
- Modeling of the server interface or companion specifications
- Alarms & Conditions in the OPC UA server of SIMATIC Alarms & Conditions at the standard SIMATIC interface
- Global Discovery Service (GDS) support for certificate management
- Support for modern OPC UA Security Profiles (signing and encryption)
- Access control with role management
- Openness support for easy handling, e.g., via SiOME
- Diagnostic buffer entries for OPC UA server and OPC UA diagnostics in the TIA Portal

OPC UA Client with the following functionality:

- PLCopen OPC UA Client function blocks for easy handling
- OPC UA Data Access, Read/Write
- OPC UA Methods for consistent data transmission

Licensing

An OPC UA Server or OPC UA Client is present on the target systems (CPUs), and the purchase of the necessary runtime licenses must be confirmed and proven.

Runtime licenses are offered in four levels for different target systems:

Target system	OPC UA S7-1200 Basic	OPC UA S7-1500 Small	OPC UA S7-1500 Medium	OPC UA S7-1500 Large
S7-1200 CPUs	Yes	No	No	No
ET 200SP CPU 1510SP/1512SP (Open Controller) S7-1500 CPU 1511/1513 CPU 1504D Drive Controller	No	Yes	Yes	Yes
1515SP (Open Controller), ET 200pro CPU 1516pro S7-1500 CPU 1515/1516 PLC 1507S software	No	No	Yes	Yes
S7-1500 CPU 1517/1518/1508S CPU 1507D Drive Controller S7-1517V (virtual PLC)	No	No	No	Yes

The runtime license contains the certificate for OPC UA (server and client) and can be executed on the respective target systems including F, C, T/TF, R, H.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

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Selection and ordering data

SIMATIC OPC UA S7-1200 Basic	
Single runtime license; can run on all S7-1200 CPUs (incl. F) from firmware V4.4	
License certificate for OPC UA server (data access)	**6ES7823-0BA00-2BA0**
Download incl. license certificate for OPC UA server (data access) [1] Email address required for delivery	**6ES7823-0BE00-2BA0**
SIMATIC OPC UA S7-1500 Small	
Single runtime license; can run on ET 200SP CPU 1510SP/1512SP (Open Controller), S7-1500 CPU 1511/1513, CPU 1504D, CPU 1505S Drive Controllers	
License certificate for OPC UA Server (Data Access and OPC UA Client)	**6ES7823-0BA00-1BA0**
Download incl. license certificate for OPC UA server (data access and OPC UA client) [1] Email address required for delivery	**6ES7823-0BE00-1BA0**
SIMATIC OPC UA S7-1500 Medium	
Single runtime license; can run on ET 200pro CPU 1516pro, ET 200SP CPU up to 1515SP (Open Controller), S7-1500 CPU up to 1516, Software PLC 1507S	
License certificate for OPC UA Server (Data Access and OPC UA Client)	**6ES7823-0BA00-1CA0**
Download incl. license certificate for OPC UA server (data access and OPC UA client) [1] Email address required for delivery	**6ES7823-0BE00-1CA0**
SIMATIC OPC UA S7-1500 Large	
Single runtime license; can run on ET 200pro CPU, ET 200SP CPU (Open Controller), S7-1500 CPU, Software PLC 1507S, 1508S, Drive Controller CPU 1504D, CPU 1507D, S7-1517V (virtual PLC)	
License certificate for OPC UA Server (Data Access and OPC UA Client)	**6ES7823-0BA00-1DA0**
Download incl. license certificate for OPC UA server (data access and OPC UA client) [1] Email address required for delivery	**6ES7823-0BE00-1DA0**

[1] Up-to-date information and download availability can be found under this link.

Technical specifications

Can be used for	
SIMATIC OPC UA S7-1200	For all S7-1200 CPUs from firmware V4.4
SIMATIC OPC UA S7-1500	For all S7-1500 CPUs and ET 200SP CPUs with firmware V2.0 or higher (incl. S/F/T versions) and PLCSIM Advanced

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Overview



TIA Portal Multiuser Engineering is a TIA Portal option for collaborative engineering of automation projects. It allows several engineers to work on one TIA Portal project at the same time. A separate server application manages the central project data. It runs flexibly alongside a TIA Portal installation. This architecture ensures data integrity during parallel work. The result is coordinated and efficient project development even during parallel processing.

Licensing

- The number of available licenses determines the number of TIA Portal computers on which the software can be used simultaneously (Floating License).
- The software is included in the STEP 7 / WinCC (TIA Portal) installation. A license key is required for use.
- Users of previous versions V14 to V20 can upgrade to version V21.
- A Software Update Service is optionally available.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your software licenses with the Automation License Manager under this link.

Selection and ordering data

TIA Portal Multiuser Engineering	
V21	
Software is a component of STEP 7 / WinCC as of V21. Only the Certificates of License (CoL) are delivered with the license.	
Data storage medium package, floating license, license key on USB flash drive	**6ES7823-1AA25-0YA5**
Download incl. license key, floating license; license key for download [1] Email address required for delivery	**6ES7823-1AE25-0YA5**
Upgrade	
Software is a component of STEP 7 / WinCC as of V21. Only the Certificates of License (CoL) are delivered with the license.	
Upgrade TIA Portal Multiuser Engineering V14...V20 to V21, floating license; license key on USB flash drive	**6ES7823-1AA25-0YE5**
Upgrade TIA Portal Multiuser Engineering V14...V20 to V21, floating license; license key for download [1] Email address required for delivery	**6ES7823-1AE25-0YE5**
V20	
Software is a component of STEP 7 / WinCC as of V20. Only the Certificates of License (CoL) are delivered with the license.	
Data storage medium package, floating license, license key on USB flash drive	**6ES7823-1AA24-0YA5**
Download incl. license key, floating license; license key for download [1] Email address required for delivery	**6ES7823-1AE24-0YA5**
Upgrade	
Software is a component of STEP 7 / WinCC as of V20. Only the Certificates of License (CoL) are delivered with the license.	
Upgrade TIA Portal Multiuser Engineering V14...V19 to V20, floating license; license key on USB flash drive	**6ES7823-1AA24-0YE5**
Upgrade TIA Portal Multiuser Engineering V14...V19 to V20, floating license; license key for download [1] Email address required for delivery	**6ES7823-1AE24-0YE5**
Software Update Service [2]	
Data storage medium package	**6ES7823-1AA00-0YL5**
Download [1] Email address required for delivery	**6ES7823-1AE00-0YL5**

[1] Up-to-date information and download availability can be found at this link.

[2] For more information see Software Update Service.

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Overview

Software to support quality assurance of automation programs in the TIA Portal

Contains tools for checking the programming style and for creating test routines for software modules:

- Styleguide Checker:
  To ensure a unified programming style, rule sets with programming guidelines in the TIA Portal project can be defined as well as their compliance regularly checked.
- Application test:
  To check the correct processing of individual logic blocks or entire S7-1200 G2 and S7-1500 applications, test routines with function tests can be created in a TIA Portal project and subsequently executed and validated with help of SIMATIC S7-PLCSIM Advanced.
- System test:
  The system test allows the user to define and execute test cases for a PLC program using OPC UA server interfaces. The system test permits the following tests to be performed:
  - Hardware-in-the-loop tests with S7-1200 and S7-1500
  - Software-in-the-loop tests with S7-PLCSIM Advanced

New with V21

General:

- A new function authorization for user administration in the TIA Portal is available. The new role "Edit Test Suite Data" has been added to protect tests/rules within the TIA Portal Test Suite from unauthorized access. Without this new right, the user may only execute the test cases/rule sets and adjust the scope.

Application test:

- S7-PLCSIM Advanced V8 supports the S7-1200 G2 controller family. Therefore, TIA Portal Test Suite supports the execution of application tests for the S7-1500 and S7-1200 G2 controllers.

Licensing

- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The application tests created with the Test Suite can only be executed in conjunction with SIMATIC S7-PLCSIM Advanced. An additional SIMATIC S7-PLCSIM Advanced license is only required in "ExternallyManagedPLCSIMInstance" mode.
- There is also the option of completing a Software Update Service.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

TIA Portal Test Suite Advanced V21 Software to support quality assurance of automation programs in the TIA Portal; Software can exclusively be used together with STEP 7 Professional / WinCC as of V21. To execute application tests, the SIMATIC S7-PLCSIM Advanced software must also be installed. Floating license, software, documentation and license key for download [1] Email address required for delivery	**6ES7823-1TE25-0AA5**
Bundle TIA Portal Test Suite V21 + PLCSIM Advanced V8.0 Floating license, software, documentation and license key for download [1] Email address required for delivery	**6ES7823-1TE25-0CA5**
Upgrade Upgrade from TIA Portal Test Suite Advanced V16...V20 to V21, floating license, software, documentation and license key for download [1] Email address required for delivery	**6ES7823-1TE25-0AE5**
Software Update Service [2] Download incl. license key [1] Email address required for delivery	**6ES7823-1TE00-0AL5**

[1] Up-to-date information and download availability can be found at this link.

[2] For more information see Software Update Service.

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Overview

The TIA Portal Cloud Connector makes it possible to access the local PG/PC interface and the connected SIMATIC hardware from a TIA Portal engineering system in a cloud environment. Access can be made directly from TIA Portal Cloud or a private cloud via Remote Desktop.

Licensing

- The TIA Portal Cloud Connector installed locally on the machine requires a license. Exception: no license is required when using TIA Portal Cloud

Selection and ordering data

TIA Portal Cloud Connector	
Single license; software is component of STEP 7 / WinCC V14 and higher. Only the Certificates of License (CoL) are delivered with the license.	
• TIA Portal Cloud Connector V2.0 – USB flash drive - Single license. For use with separately licensed TIA Portal products; refer to entry ID 109739390, FAQ "What are the conditions for using the TIA Portal Cloud Connector?"; license key on USB flash drive; software and documentation see entry ID 109780755; Class A; 6 languages: en, de, fr, it, es, zh; executable under Win10, Win11 - Contents: 1x USB flash drive	**6ES7823-1CA02-0YA0**
• TIA Portal Cloud Connector V2.0 – download [1] - Single license download. For use with separately licensed TIA Portal products; refer to entry ID 109739390, FAQ "What are the conditions for using the TIA Portal Cloud Connector?"; license key for download; software and documentation, see entry ID 109780755; Class A; 6 languages: en, de, fr, it, es, zh; executable under Win10, Win11 - Consignee email address required for delivery	**6ES7823-1CE02-0YA0**
• TIA Portal Cloud Connector V2.0 – For Industrial Edge	Industrial Edge Marketplace

[1] For up-to-date information and download availability, see: www.siemens.com/tia-online-software-delivery

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Overview

The Teamcenter Gateway permits storage and management of TIA Portal projects and global libraries in Teamcenter. Program handling is integrated into the TIA Portal.

Licensing

- Please note the compatibility of the installed program versions for the operation of the Teamcenter Gateway.
- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to the current version is offered for users of previous versions.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

TIA Portal Teamcenter Gateway Download, incl. license certificate and license key for TIA Portal Teamcenter Gateway V21, floating license Email address required for delivery	**6ES7823-1EE25-0YA5**
Upgrade Upgrade TIA Portal Teamcenter Gateway V14...V20 to V21, floating license; license key for download; Email address required for delivery	**6ES7823-1EE25-0YE5**
Software Update Service Download Email address required for delivery	**6ES7823-1EE00-0YL5**

More information on the license types, the download, and the Software Update Service can be found under this link.

Technical specifications

Can be used with:

- TIA Portal V14 or higher
- Teamcenter V13...V14/2306...2506

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Overview

The TIA Portal CAx Publication Tools are used to export metadata from TIA Portal that is required for the exchange of Openness attributes using AutomationML. This allows Openness attributes to be exchanged with other tools, e.g. EPLAN P8, via an AutomationML file.

Licensing

- Please note the compatibility of the installed program versions for the operation of the CAx Publication Tool.
- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

TIA Portal CAx Publication Tools V2.0 Floating license download; option for TIA Portal engineering software; software, documentation and license key for download, Class A; 1 language: en; executable with STEP 7 Professional V19; Consignee email address required for delivery	**6ES7823-1JE02-0EA5**
TIA Portal CAx Publication Tools V3.0 Floating license download; option for TIA Portal engineering software; software, documentation and license key for download, Class A 1 language: en; executable with STEP 7 Professional V20; Consignee email address required for delivery	**6ES7823-1JE03-0EA5**
TIA Portal CAx Publication Tools V3.0 Upgrade V1.0, V2.0 -> V3.0; floating license download; option for TIA Portal engineering software; software, documentation and license key for download, Class A; 1 language: en; executable with STEP 7 Professional V20; Consignee email address required for delivery	**6ES7823-1JE03-0EE5**
TIA Portal CAx Publication Tools V4.0 Floating license download; option for TIA Portal engineering software; software, documentation and license key for download, Class A 1 language: en; executable with STEP 7 Professional V21; Consignee email address required for delivery	**6ES7823-1JE04-0EA5**
TIA Portal CAx Publication Tools V4.0 Upgrade V1.0 .. V3.0 -> V4.0; floating license download; option for TIA Portal engineering software; software, documentation and license key for download, Class A 1 language: en; executable with STEP 7 Professional V21; Consignee email address required for delivery	**6ES7823-1JE04-0EE5**
TIA Portal CAx Publication Tools, Software Update Service (SUS), download for TIA Portal Under this contract, you receive all software versions for one year. The contract is automatically extended for one more year unless it is canceled three months before expiration. Delivery and service period: 1 year from date of invoice. Prerequisite for conclusion: current software version; Consignee email address required for delivery	**6ES7823-1JE03-0EL5**

1) Up-to-date information and download availability can be found under this link.

Technical specifications

Can be used with:

- V1 for TIA Portal V18
- V2 for TIA Portal V19
- V3 for TIA Portal V20
- V4 for TIA Portal V21

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Overview

SIMATIC Visualization Architect (SiVArc)

Challenge:

- To standardize the user interfaces of the visualizations throughout the plant
- Significant reduction of the engineering costs for generating the visualizations
- To make the in-house work standard usable

Solution:

- Automatic generation and creation of the visualizations, based on the program code of the PLC and corresponding visualization objects within the framework of system-wide library concepts.

Licensing

- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to the subsequent version is offered for users of previous versions.
- A rental license is available for temporary use
- The software can be tested in restricted mode without a license.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

SIMATIC Visualization Architect V20	
As package	
• SIMATIC Visualization Architect V20	**6AV2107-0PX02-4AA5**
• SIMATIC Visualization Architect V20 Rental	**6AV2107-0PX02-4AA6**
As download [1]	
• SIMATIC Visualization Architect V20	**6AV2107-0PX02-4AH5**
• SIMATIC Visualization Architect V20 Rental	**6AV2107-0PX02-4AH6**
• SIMATIC Visualization Architect V20 Trial	Download in Customer Support Portal
Upgrade SIMATIC Visualization Architect	
Engineering software in the TIA Portal; software and documentation on CD, License key on USB flash drive Class A; 6 languages: en, de, fr, es, it, zh	
V19 -> V20	
• As package	**6AV2107-3PX02-4AA5**
• As download [1] Email address required for delivery	**6AV2107-3PX02-4AH5**
V18 -> V19	
• As package	**6AV2107-3PX02-3AA5**
• As download [1] Email address required for delivery	**6AV2107-3PX02-3AH5**
Software Update Service (SUS)	
SIMATIC Visualization Architect	
Within the framework of the SUS contract, you are provided with all software updates for the SiVArc product at no cost over a period of one year from the date of invoice. The contract is automatically extended by a further year unless canceled three months before expiration. The prerequisite for agreeing to an SUS is the presence of the current version.	
• As package	**6AV2107-0PX00-0AL0**
• As download [1] Email address required for delivery	**6AV2107-0PX00-0AY0**

1) Up-to-date information and download availability can be found under this link.

Technical specifications

SIMATIC Visualization Architect	
Operating system requirements	In accordance with the requirements of the TIA Portal components: • SIMATIC STEP 7 (TIA Portal) • SIMATIC WinCC Unified, Professional, Advanced, Comfort, Basic
Supported STEP 7 version	SIMATIC STEP 7 V20
Supported WinCC versions	SIMATIC WinCC V20 Unified, Professional, Advanced, Comfort, Basic

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Overview

The TIA Portal option ProDiag makes it possible to monitor a machine or plant and to intervene in the event of a fault. The monitoring messages which can be generated for the various faults provide specific information on the monitoring mode, location and cause of the fault. Information on troubleshooting can be provided in addition. Plant operators can then not only recognize faults, they can also identify any potential danger in advance and take appropriate countermeasures.

Licensing

- The runtime license for controllers includes 250 supervisions or an unlimited number of supervisions per CPU. From FW 2.0 onwards, the software can run on S7-1500/ET 200SP CPUs regardless of the TIA Portal version.
- For the visualization of the messages, the controls are licensed according to the HMI runtime platforms.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

SIMATIC ProDiag for HMI	
For WinCC Unified PC Runtime	
Controls for SIMATIC WinCC Unified as of V18	
• Package with data storage medium	**6AV2157-0BD02-4AB0**
• Download incl. license key [1] Email address required for delivery	**6AV2157-0BD02-4LB0**
For WinCC Runtime Advanced	
Controls for SIMATIC WinCC as of V14.	
• Package with data storage medium	**6AV2107-0UA00-0BB0**
• Download incl. license key [1] Email address required for delivery	**6AV2107-0UA00-0BH0**
For WinCC Runtime Professional	
Controls for SIMATIC WinCC as of V14	
• Package with data storage medium	**6AV2107-0UB00-0BB0**
• Download incl. license key [1] Email address required for delivery	**6AV2107-0UB00-0BH0**
For SIMATIC Comfort / Mobile Panels	
Controls for SIMATIC WinCC as of V14.	
• Package with data storage medium	**6AV2107-0UP00-0BB0**
• Download incl. license key [1] Email address required for delivery	**6AV2107-0UP00-0BH0**
SIMATIC ProDiag S7-1500	
For 250 monitoring functions	
For SIMATIC S7-1500 CPUs and ET 200SP CPUs with FW 2.0 and higher. Independent of the TIA Portal version.	
• Package with data storage medium	**6ES7823-0AA00-1AA0**
• Download incl. license key [1] Email address required for delivery	**6ES7823-0AE00-1AA0**
For all configured monitoring functions on a CPU	
For SIMATIC S7-1500 CPUs and ET 200SP CPUs with FW 2.0 and higher. Independent of the TIA Portal version.	
• Package with data storage medium	**6ES7823-0AA00-1DA0**
• Download incl. license key [1] Email address required for delivery	**6ES7823-0AE00-1DA0**

[1] Up-to-date information and download availability can be found at this link.

Technical specifications

Can be used for	
SIMATIC ProDiag for HMI	For all Comfort and Mobile Panels, WinCC Runtime Advanced and WinCC Runtime Professional as of TIA Portal V14 For WinCC Unified PC Runtime as of TIA Portal V18
SIMATIC ProDiag for S7-1500	For all S7-1500 CPUs and ET 200SP CPUs with FW V2.0 and higher

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Overview

The SIMATIC Modular Application Creator enables the automated generation of TIA Portal projects based on pre-defined software modules. Especially with complex machine configurations, such as a multi-belt control, a printing machine or other applications with many axes,
this is very efficient compared to manually creating and parameterizing the associated automation project directly in the TIA Portal.

The software modules provide a technological view of the application and can be used in the TIA Portal without programming knowledge.
They are stored in a separate repository, independent of the tool, which needs to be connected to the tool.

Licensing

- The SIMATIC Modular Application Creator and the existing modules are available as a free download via the Siemens Industry Online Support.
- For modules that are charged for, an Engineering license is required that entitles the holder to generate TIA Portal projects for 365 days.

Selection and ordering data

SIMATIC Modular Application Creator For automated generation of TIA Portal projects with use of pre-configured software modules	Can be downloaded from this link.
SIMATIC Modular Application Creator Equipment modules Pre-configured software modules for use with the SIMATIC Modular Application Creator	Can be downloaded from this link.
SIMATIC Modular Application Creator licenses The license authorizes generation of TIA Portal projects with the corresponding equipment module for 365 days.	
• Multi-Carrier-System / TS 2 Booster	**6ES7823-1ME01-0BN8**
• Converting Toolbox	**6ES7823-1ME02-0BN8**
• Print Standard	**6ES7823-1ME03-0BN8**

[1] Up-to-date information and download availability can be found at this link.

Technical specifications

The SIMATIC Modular Application Creator can be used for:

- TIA Portal and StartDrive as of V16.0, with activated Openness interface and
- All SIMATIC S7-1500 CPUs as of FW version 4.8.

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Overview

The User Management Component (UMC) provides the possibility of central user management. Through the connection to the TIA Portal, users and user groups can be defined and managed across projects. Connection to a Microsoft Active Directory is also possible.

Licensing

- Central user management (UMC) is part of the scope of delivery of TIA Portal.
- The license model depends on the number of user accounts per UMC domain.
- Up to ten user accounts can be used without a license.
- For additional user accounts, 365-day rental licenses and single licenses are available to add to the required number of centrally managed users.

Selection and ordering data

Central user management (UMC) Software component to implement central user management, included in the scope of supply of the respective products (e.g. TIA Portal). The license model depends on the number of user accounts per UMC domain. Use of max. 10 user accounts possible without a license. 6 languages: de, en, fr, es, it, zh; executable on Windows 10 (21H2 or later), Windows 11 (21H2 or later), Windows Server 2019, Windows Server 2022 (21H2 or later)	
• Rental license 365 days with license certificate for 100 user accounts	**6ES7823-1UE30-0YA0**
• Rental license 365 days with license certificate for 4 000 user accounts	**6ES7823-1UE10-0YA0**
• Single license with license certificate for 100 user accounts	**6ES7823-1UE31-0YA0**
• Single license with license certificate for 1000 user accounts	**6ES7823-1UE21-0YA0**
• Single license with license certificate for 4000 user accounts	**6ES7823-1UE11-0YA0**

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Overview

Comprehensive TIA portfolio with flexible deployment and licensing options - tailored to your needs

TIA as a Service bundles cloud-based and on-premise software offerings for the flexible use of TIA Portal and related engineering services. It enables customers to choose the deployment model that best fits their individual IT strategy, security requirements, and operational needs.

The portfolio offers maximum freedom of choice through flexible licensing models, including subscription and usage-based options. This allows customers to scale their engineering capacity as needed and supports the transition from capital expenditure (CapEx) to operational expenditure (OpEx), enabling more predictable and adaptable cost structures.

TIA as a Service gives users the flexibility to select the right solution for each use case – from highly controlled local environments to flexible, on-demand software usage. By aligning licensing and deployment with business requirements, it helps optimize investment decisions, increase cost efficiency, and adapt engineering resources dynamically to project demands.

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Overview

Cloud-based services for engineering, simulation, and collaboration with TIA Portal

TIA Cloud Services bring engineering, simulation, and collaboration together in a flexible cloud environment. The portfolio combines three complementary services that cover the entire engineering lifecycle – from individual engineering workstations to simulation and team collaboration.

- TIA Portal Cloud provides a fully virtualized engineering environment, enabling instant access to TIA Portal without local installation and allowing users to scale engineering capacity on demand.
- TIA Simulation Cloud enables cloud-based execution of simulation scenarios, supporting virtual commissioning, testing, and validation without the need for local hardware.
- TIA Project-Server Cloud offers a centralized platform for collaborative engineering, allowing multiple users to work simultaneously on projects with full transparency and consistency.

TIA Cloud Services are based on flexible licensing models, including subscription and usage-based options, allowing customers to scale their usage according to project needs. All services are always up to date, eliminating the need for manual updates, infrastructure management, or maintenance activities.

By combining scalability, reduced IT effort, and seamless integration, TIA Cloud Services help increase engineering efficiency, reduce total cost of ownership, and accelerate time-to-market for automation solutions.

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Overview

Virtualized TIA Portal engineering environment in the cloud

TIA Portal Cloud provides a fully virtualized engineering environment, enabling seamless access to TIA Portal versions and option packages via the cloud. It allows rapid provisioning of engineering workplaces while significantly reducing local IT efforts.

Flexible usage scenarios – from occasional access to intensive project work – allow users to scale engineering capacity on demand. This increases efficiency and accelerates engineering processes through immediate availability of a ready-to-use engineering environment.

Licenses:

- 21-day trial:
  Free trial period enabling users to explore TIA Portal Cloud and its capabilities without commitment.
  https://tiacloudservices.siemens.com/tia-portal-cloud/trials/6ES7804-0CP20-1YA7/21-trial
- Pay-per-use (hour-based):
  Billed based on actual usage time with precise hourly accounting and monthly invoicing.
- Monthly subscription:
  Unlimited usage within one month; automatically renews unless cancelled before the end of the contract period.
- Annual subscription:
  Unlimited usage for one year, including free access to SITRAIN access – the digital learning platform.
- 365-day certificate:
  Fixed-term certificate with a validity of 365 days; does not renew automatically. Activation details are provided via PDF.
- 100-hour certificate:
  Certificate with a prepaid credit of 100 hours; activation details are provided via PDF.

Selection and ordering data

TIA Portal Cloud, 100 hours of credit You receive a Certificate of License with 100 hours of credit. The credit is valid for 365 days, starting at the delivery date. Content: Certificate of Contract (CoC) Consignee email address required for delivery. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0CP41-3YA8**
TIA Portal Cloud, 365-day certificate (CoC) You receive a Certificate of Contract for the activation of TIA Portal Cloud for 365 days, starting at the delivery date. This certificate expires automatically. Content: Certificate of Contract (CoC) Consignee email address required for delivery. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0CP41-1YA8**
TIA Portal Cloud, pay-per-use (hourly) The user's email address must be assigned directly in SiePortal. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0CP41-3YA0**
TIA Portal Cloud, monthly subscription The user's email address must be assigned directly in SiePortal. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0CP41-2YA0**
TIA Portal Cloud and SITRAIN access, annual subscription Your benefit: In addition to TIA Portal Cloud, you get free access to SITRAIN access - the digital learning platform. Your engineering environment and your know-how always up-to-date, thanks to cloud technology anywhere and anytime. Consignee email address required for delivery. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0CP41-1YA0**

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Overview

Cloud-based simulation for virtual commissioning

TIA Simulation Cloud enables efficient, scalable simulation of automation solutions directly in the cloud. Users can execute simulation models without local hardware, accelerating virtual commissioning and reducing setup efforts.

The solution supports both 2D and 3D simulation scenarios and allows flexible scaling based on project requirements. TIA Simulation Cloud helps minimize risks, shorten time-to-market, and improve engineering quality through comprehensive testing, training, and validation in a virtual environment.

Offerings:

2D Simulation Engineering

- Cost-efficient 2D engineering and simulation
- 8-hour free trial: https://tiacloudservices.siemens.com/tia-simulation-cloud/2d-simulation-engineering/20

3D Simulation Player

- 2D engineering and simulation with performant 3D visualization
- 8-hour free trial: https://tiacloudservices.siemens.com/tia-simulation-cloud/3d-simulation-player/20

Selection and ordering data

TIA Simulation Cloud, 50 hours for 2D simulation engineering You receive a Certificate of License with 50 hours of credit for 2D simulation engineering. The credit is valid for 365 days, starting at the delivery date. Content: Certificate of License (CoL) Consignee email address required for delivery. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0VP41-3AA8**
TIA Simulation Cloud, 50 hours for 3D simulation player You receive a Certificate of License with 50 hours of credit for 3D simulation player. The credit is valid for 365 days, starting at the delivery date. Content: Certificate of License (CoL) Consignee email address required for delivery. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0VP41-3BA8**

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Overview

Cloud-based TIA Project-Server for multi-user engineering

TIA Project-Server Cloud provides a centralized, cloud-based platform for managing and collaborating on TIA Portal projects. Multiple users can access projects simultaneously, track changes transparently, and coordinate engineering workflows efficiently.

The solution enables seamless collaboration across locations and teams, improving transparency, consistency, and productivity throughout the entire project lifecycle. By centralizing project data in the cloud, TIA Project-Server Cloud enhances collaboration, reduces coordination effort, and accelerates engineering execution.

Selection and ordering data

TIA Project Server Cloud, annual subscription including 500 GB project memory The user's email address must be assigned directly in SiePortal. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0PP01-1YA0**
TIA Project Server Cloud, monthly subscription including 200 GB project memory The user's email address must be assigned directly in SiePortal. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0PP01-2YA0**
TIA Project Server Cloud, 365-day certificate (CoC) You receive a Certificate of Contract for the activation of TIA Project Server Cloud for 365 days with 500 GB project memory, starting at the delivery date. This certificate expires automatically after 365 days. Content: Certificate of Contract (CoC). Consignee email address required for delivery. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0PP01-1YA8**
TIA Project Server Cloud, 31-day certificate You receive a Certificate of License for enabling the service for 31 days with 200 GB project memory. The credit is valid for 365 days, starting at the delivery date. The service can be used for 31 days, starting with the day of assignment. Content: Certificate of License (CoL) Consignee email address required for delivery. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0PP01-2YA8**
TIA Project Server Cloud, 10 hours of credit You receive a Certificate of License with 10 hours of credit with 200 GB project memory. The credit is valid for 365 days, starting at the delivery date. The service can be used for 10 hours , from the start of use. Interruptions are possible. Content: Certificate of License (CoL) Consignee email address required for delivery. Only the specific terms under https://tiacloudservices.siemens.com/terms-and-conditions apply.	**6ES7804-0PP01-3YA8**

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Overview

On-premise software solutions for TIA engineering

TIA On Premise Services provide the established software portfolio for local TIA Portal engineering. They offer maximum control over infrastructure, data, and system integration, making them ideal for environments with specific IT, compliance, or security requirements.

Modern subscription-based licensing models ensure flexibility and scalability, allowing customers to adapt their usage to project needs while maintaining full control of their local environment.

With full compatibility to the broader TIA ecosystem, TIA On Premise Services enable seamless integration into existing infrastructures and support long-term, stable engineering operations where cloud usage is limited or not desired.

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Overview

Preconfigured software packages for local TIA Engineering

TIA Portal Subscription Bundles offer preconfigured software packages for local engineering with TIA Portal. They combine core TIA Portal functionalities with optional add-ons, enabling a structured and ready-to-use solution for different engineering requirements.

The bundles support a wide range of use cases – from basic engineering tasks to advanced applications – while simplifying software selection and deployment.

With their subscription-based licensing model, TIA Portal Subscription Bundles provide predictable costs, continuous access to the latest software updates, and the flexibility to adapt usage as project needs evolve. This ensures efficient planning, reduced upfront investment, and a modern approach to local engineering software.

Bundles:

TIA Portal Basic

- STEP 7 Basic
- STEP 7 Safety Basic
- WinCC Basic

TIA Portal Engineering

- STEP 7 Professional (TIA Portal)
- STEP 7 Safety Advanced
- WinCC Adv/Unified (10k)
- TIA Portal Multiuser Engineering

TIA Portal Engineering & Simulation

- TIA Portal Engineering Bundle +
- S7-PLCSIM Advanced
- TIA Portal Test Suite Advanced

Selection and ordering data

TIA Portal Subscription Bundle Basic Engineering Subscription service download; T&Cs for the service can be found in the GTCs in the section "Rental Licenses"; 365-day floating licenses; Software, documentation and licenses for download; Within the framework of this contract, you will receive for one year all up-to-date software versions. Period of delivery and service: 1 year from date of invoice. Automatic extension of contract by 1 year if not canceled 3 months before expiry; Requirement for conclusion: none Consignee email address required for delivery	**6ES7823-1SE10-0YN5**
TIA Portal Subscription Bundle Engineering Subscription service download; T&Cs for the service can be found in the GTCs in the section "Rental Licenses"; 365-day floating licenses; Software, documentation and licenses for download; Within the framework of this contract, you will receive for one year all up-to-date software versions. Period of delivery and service: 1 year from date of invoice. Automatic extension of contract by 1 year if not canceled 3 months before expiry; Requirement for conclusion: none Consignee email address required for delivery	**6ES7823-1SE20-0YN5**
TIA Portal Subscription Bundle Engineering & Simulation Subscription service download; T&Cs for the service can be found in the GTCs in the section "Rental Licenses"; 365-day floating licenses; Software, documentation and licenses for download; Within the framework of this contract, you will receive for one year all up-to-date software versions. Period of delivery and service: 1 year from date of invoice. Automatic extension of contract by 1 year if not canceled 3 months before expiry; Requirement for conclusion: none Consignee email address required for delivery	**6ES7823-1SE30-0YN5**

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Overview

Subscription license for advanced PLC simulation

SIMATIC S7 PLCSIM Advanced Subscription enables powerful simulation of SIMATIC controller programs in a local environment. It supports virtual commissioning, testing, and validation of complex automation systems without requiring physical hardware.

With this subscription-based licensing model, users benefit from continuous access to the latest software updates, ensuring that their simulation environment is always up to date. At the same time, the subscription model offers flexibility to adapt usage to project needs while reducing upfront investment and enabling predictable costs.

Selection and ordering data

SIMATIC S7-PLCSIM Advanced subscription service download T&Cs for the service can be found in the GTCs in the section "Rental Licenses"; 365-day floating licenses; software, documentation and licenses for download; Within the framework of this contract, you will receive for one year all up-to-date software versions. Software class A; Period of delivery and service: 1 year from date of invoice. Automatic extension of contract by 1 year if not canceled 3 months before expiry; Requirement for conclusion: none; Consignee email address required for delivery	**6ES7823-1FE00-0YN5**

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Overview

SIMATIC AX Logic Control Engineering
Automation at the speed of software development

SIMATIC AX Logic Control Engineering brings IT practices to automation. It uses modular engineering to support IT-savvy automation engineers. The toolchain is versatile and adaptable to user needs. Engineers can work together from anywhere.

Development uses a modern IDE based on Visual Studio Code. Object-oriented ST code can be reused in ladder diagram (XLad). Unit testing improves software quality without hardware. Native GIT integration enables version and source control. A CLI-first approach accelerates engineering tasks. A GUI supports guided usage when needed. Package management with apax handles dependencies and updates. CI pipelines enable stable, automated release cycles. Cloud connections allow remote deployment from anywhere. Plain text source code supports transparency and automation. An open API enables extensions, scripts, and packages. A community on GitHub provides support and engagement.

Available as cloud SaaS or as a local AX Code IDE.

Runtime targets include S7-1500, S7-1200 G2 and Virtual S7-PLC. PLCSIM Advanced is also supported.

Runtime Targets:

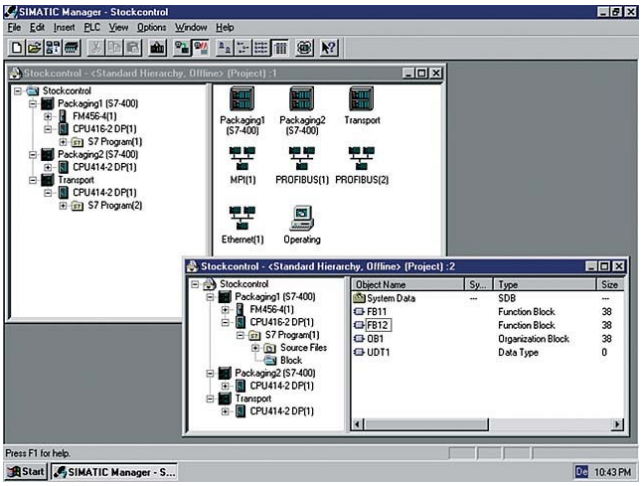
- S7-1500
- S7-1200 G2
- Virtual S7-PLC
- PLCSIM Advanced

SIMATIC AX can be ordered in the Industrial Software Store under this link.

Find more information on Siemens.com.

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Overview



- Basic software STEP 7:
  The standard tool for the SIMATIC S7, SIMATIC C7 and SIMATIC WinAC automation systems.
- For fully utilizing the performance capability of the systems.
- With user-friendly functions for all phases of an automation project:
  - Configuration and parameter assignment of the hardware
  - Specifying the communication
  - Programming
  - Testing, commissioning and service
  - Documentation, archiving
  - Operating, diagnostic functions

Note

The STEP 7 (TIA Portal) engineering software is required to program the new generation of S7-1200, S7-1500 and ET 200SP CPU PLCs as well as the S7-1500 Software Controller; it can also be used for programming the S7-300, S7-400 and SIMATIC WinAC.

Siemens offers a combo license for both platforms which enables you to work using both STEP 7 (TIA Portal) as well as traditional engineering software (STEP 7 V5.x). See "STEP 7 Professional" for more information.

Licensing

- STEP 7 V5.7 can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- A 50 h rental license is available for limited use.
- An upgrade to version V5.7 is offered for users of the previous V5.3...5.6 versions.
- A V5.6 license is also valid for the version V5.7.
- A trial license is available for testing purposes.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

STEP 7 Version 5.7 **Target system:** SIMATIC S7-300/400, SIMATIC C7 **Requirement:** Windows 11 Professional/Enterprise, Windows Server 2019/2022/2025 **Type of delivery:** English, German, French, Spanish, Italian	
Floating license; Software, documentation and license key on USB flash drive	**6ES7810-4CC12-0YA5**
Floating license, download[1]; Software, license key and documentation as download; Consignee email address required for delivery	**6ES7810-4CE12-0YB5**
Rental license for 50 hours; Software, documentation and license key on USB flash drive	**6ES7810-4CC12-0YA6**
Rental license for 50 hours, download[1]; Software, license key and documentation as download; Consignee email address required for delivery	**6ES7810-4CE12-0YB6**
Upgrade Floating License V5.3...5.6 to V5.7; Software, documentation and license key on USB flash drive	**6ES7810-4CC12-0YE5**
Upgrade floating license V5.3...V5.6 to V5.7, download[1]; Software, license key and documentation as download; Consignee email address required for delivery	**6ES7810-4CE12-0YE5**
Upgrade floating license V5.6 to V5.7, download[1]; Software, license key and documentation as download; Consignee email address required for delivery	**6ES7810-4CE12-0YC5**
STEP 7 Version 5.7 Japanese **Target system:** SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC **Requirement:** Windows 11 Professional/Enterprise, Windows Server 2019/2022/2025 **Type of delivery:** English, Japanese; incl. license key, with electronic documentation	
Floating license Japanese; Software, documentation and license key on USB flash drive	**6ES7810-4CC12-0JA5**
Upgrade floating license Japanese V5.3...V5.6 to V5.7; Software, documentation and license key on USB flash drive	**6ES7810-4CC12-0JE5**
Floating license, download[1]; Software, license key and documentation as download; Consignee email address required for delivery	**6ES7810-4CE12-0JB5**
Upgrade floating license V5.3...V5.6 to V5.7, download[1]; Software, license key and documentation as download; Consignee email address required for delivery	**6ES7810-4CE12-0JE5**
STEP 7 Version 5.7 Chinese **Target system:** SIMATIC S7-300/400, SIMATIC C7 **Requirement:** Windows 11 Professional/Enterprise, Windows Server 2019/2022/2025 **Type of delivery:** English, Chinese; incl. license key on USB flash drive, with electronic documentation	
Floating license Chinese; Software, documentation and license key on USB flash drive	**6ES7810-4CC12-0KA5**
Upgrade floating license Chinese V5.3...V5.6 to V5.7; Software, documentation and license key on USB flash drive	**6ES7810-4CC12-0KE5**

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Selection and ordering data (continued)

SIMATIC Manual Collection DL in 5 languages[1)] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[1)] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**
MPI cable For linking SIMATIC S7 and PG through MPI (5 m)	**6ES7901-0BF00-0AA0**
Components for connecting a PC to MPI and PROFIBUS • For PCs with a free PCI slot:	
CP 5612	**6GK1561-2AA00**
• For PCs without a free PCI slot:	
USB A2 PC adapter For connecting a programming device/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	**6GK1571-0BA00-0AA0**
Components for connecting the PC to Industrial Ethernet • For PCs with a free PCI slot:	
Layer 2 Ethernet cards	

1) Up-to-date information and download availability can be found at this link.

Technical specifications

Article number **product type designation**	**6GK1571-0BA00-0AA0** **PC adapter USB A2**
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK1571-0BA00-0AA0
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
number of interfaces according to USB	1
type of electrical connection	
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS 485)
• of the USB interface	Standard-B socket
standard for interfaces USB 2.0	Yes
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
type of voltage supply optional external power supply	No
supply voltage	
• from USB	5 V
• note	Supply direct from USB
relative symmetrical tolerance at DC	
• at 5 V	5 %
consumed current	
• from USB	0.2 A
power loss [W]	1 W
ambient conditions	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity at 30 °C during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	USB V2.0 adapter
width	58 mm
height	26 mm
depth	105 mm
net weight	365 g
fastening method 35 mm DIN-rail mounting	No
product features, product functions, product components general	
number of plug-in cards of same design plug-in per PC station	1
number of units note	-
product functions diagnostics	
product function	
• port diagnostics	Yes
standards, specifications, approvals	
product function is supported identification link	Yes; acc. to IEC 61406-1:2022

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Technical specifications (continued)

Article number product type designation	6GK1571-0BA00-0AA0 PC adapter USB A2
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	42.7 kg
• during manufacturing	14.95 kg
• during operation	27.62 kg
• after end of life	0.13 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview



STEP 7 Professional supports all IEC languages.
In addition to the languages familiar from STEP 7:

- LAD
- FBD
- STL

the following are also available:

- "Sequential function chart"
- "Structured text"

An offline simulation of user programs created with these languages is included. STEP 7 Professional thus replaces the combination of the individual packages STEP 7, S7-GRAPH, S7-SCL and S7-PLCSIM.

A PowerPack (conversion package) is available for customers who use STEP 7 already and wish to change. A valid STEP 7 license is required for purchasing the POWERPACK. A separate Software Update Service can be purchased for STEP 7 Professional.

Note

The STEP 7 (TIA Portal) engineering software is required to program the new generation of S7-1200, S7-1500 and ET 200SP CPU PLCs as well as the S7-1500 Software Controller; it can also be used for programming the S7-300, S7-400 and SIMATIC WinAC.

Siemens offers a combo license for both platforms which enables you to work using both STEP 7 (TIA Portal) as well as traditional engineering software (STEP 7 V5.x). See "Licensing" for more information.

Licensing

- New installations of STEP 7 Professional 2021 (based on STEP 7 V5.x) are only available as combo licenses together with STEP 7 Professional (TIA Portal). The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license). A 50 h rental license is available for limited use.
- For users of the previous STEP 7 Professional 2006...2010 versions, an upgrade to the respective current Combo version (Vxx/SRx) is offered.
- The license of the version V16/2017 Combo can also be used for STEP 7 V5.7.
- PowerPack and upgrade enable migration from STEP 7 V5.7 to STEP 7 Professional Combo.
- A trial license is available for testing purposes.
- It is possible to conclude Software Update Service (SUS) contracts.

Overview (continued)

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

STEP 7 Professional **Target system:** SIMATIC S7-300/-400, SIMATIC S7-1200/-1500 **Requirement:** Windows Server 2019/2022/2025, Windows 11 Professional, Windows 11 Enterprise	
SIMATIC STEP 7 Professional V19/2021 SR2 Combo incl. TIA Portal Floating license for 1 user; eng. SW; SW and documentation on DVD, license key on USB flash drive; Class A; 5/9 languages (en, de, fr, es, it)/(zh, ru, ja, ko)	**6ES7810-5CC16-0YA5**
SIMATIC STEP 7 Professional V20/2021 SR3 Combo incl. TIA Portal Floating license for 1 user; eng. SW; SW and documentation on DVD, license key on USB flash drive; Class A; 5/9 languages (en, de, fr, es, it)/(zh, ru, ja, ko)	**6ES7810-5CC17-0YA5**
SIMATIC STEP 7 Professional V21/2021 SR4 Combo incl. TIA Portal Floating license for 1 user; eng. SW; SW, documentation and license key on USB flash drive; Class A; 5/9 languages (en, de, fr, es, it)/(zh, ru, ja, ko)	**6ES7810-5CC18-0YA5**
SIMATIC STEP 7 Professional V19/2021 SR2 Combo incl. TIA Portal; download[2)] Floating license for 1 user; eng. SW; SW, documentation and license key as download; Class A; 5/9 languages (en, de, fr, es, it)/(zh, ru, ja, ko) Consignee email address required for delivery	**6ES7810-5CE16-0YB5**
SIMATIC STEP 7 Professional V20/2021 SR3 Combo incl. TIA Portal; download[2)] Floating license for 1 user; eng. SW; SW, documentation and license key as download; Class A; 5/9 languages (en, de, fr, es, it)/(zh, ru, ja, ko) Consignee email address required for delivery	**6ES7810-5CE17-0YB5**
SIMATIC STEP 7 Professional V21/2021 SR4 Combo incl. TIA Portal; download[2)] Floating license for 1 user; eng. SW; SW, documentation and license key as download; Class A; 5/9 languages (en, de, fr, es, it)/(zh, ru, ja, ko) Consignee email address required for delivery	**6ES7810-5CE18-0YB5**
SIMATIC 50 h Eng. V19 Combo floating license download[2)] 50 hours of usage time for the following SIMATIC Engineering software: STEP 7 Professional 2021 SR2, STEP 7 Professional V19, WinCC flexible 2008, WinCC Professional V19, STEP 7 Distributed Safety V5.4, STEP 7 Safety Advanced V19; software, documentation and license key for download Consignee email address required for delivery	**6ES7823-1GE23-0YA5**
SIMATIC 50 h Eng. V20 Combo floating license download[2)] 50 hours of usage time for the following SIMATIC Engineering software: STEP 7 Professional 2021 SR3, STEP 7 Professional V20, WinCC flexible 2008, WinCC Professional V20, STEP 7 Distributed Safety V5.4, STEP 7 Safety Advanced V20; software, documentation and license key for download Consignee email address required for delivery.	**6ES7823-1GE24-0YA5**

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Selection and ordering data (continued)

SIMATIC 50 h Eng. V21 Combo floating license download[2] 50 hours of usage time for the following SIMATIC Engineering software: STEP 7 Professional 2021 SR4, STEP 7 Professional V21, WinCC flexible 2008, WinCC Professional V21, STEP 7 Distributed Safety V5.4, STEP 7 Safety Advanced V21; software, documentation and license key for download Consignee email address required for delivery.	**6ES7823-1GE25-0YA5**
SIMATIC STEP 7 Prof. V20 Combo Legacy; Upgrade V11/2010..V16/2017 Combo-> V20/2021 SR3 Combo; floating license; incl. S7 PM Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1500/1200/300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. Content: set (5x DVD + 1x USB)	**6ES7822-1AA24-0YE3**
SIMATIC STEP 7 Prof. V20 Combo Legacy; Upgrade V11/2010..V16/2017 Combo-> V20/2021 SR3 Combo; floating license download[2]**; incl. S7 PM;** Engineering software in the TIA Portal; SW, documentation and license key for download; 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1500/1200/300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. Consignee email address required for delivery.	**6ES7822-1AE24-0YE3**
SIMATIC STEP 7 Prof. V21 Combo Legacy; Upgrade V11/2010..V16/2017 Combo-> V21/2021 SR4 Combo; floating license download[2]**; incl. S7 PM;** Engineering software in the TIA Portal; SW, documentation and license key for download; 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1500/1200/300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. Consignee email address required for delivery.	**6ES7822-1AE25-0YE3**
SIMATIC STEP 7 Prof. V20 Combo; Upgrade V11..V19 -> V20 or V17/2021 Combo..V19/2021 SR2 Combo-> V20/2021 SR3 Combo Floating license; engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1500/1200/300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. Content: set (4x DVD + 1x USB)	**6ES7822-1AA24-0YE5**
SIMATIC STEP 7 Prof. V20 Combo; Upgrade V11..V19 -> V20 or V17/2021 Combo..V19/2021 SR2 Combo-> V20/2021 SR3 Combo; download[2] Floating license download; engineering software in the TIA Portal; SW, documentation and license key for download; 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1500/1200/300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. Consignee email address required for delivery.	**6ES7822-1AE24-0YE5**

Selection and ordering data (continued)

SIMATIC STEP 7 Prof. V21 Combo; Upgrade V11..V20 -> V21 or V17/2021 Combo..V20/2021 SR3 Combo-> V21/2021 SR4 Combo; download[2] Floating license download; engineering software in the TIA Portal; SW, documentation and license key for download; 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1500/1200/300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. Consignee email address required for delivery.	**6ES7822-1AE25-0YE5**
SIMATIC STEP 7 Prof. V19 Legacy PowerPack & upgrade STEP 7 V5.3. V5.6 -> V19/2021 SR2 combo floating license; incl. S7 PM Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.	**6ES7822-1AA23-0XC3**
SIMATIC STEP 7 Professional Legacy PowerPack & upgrade STEP 7 V5.3. V5.6-> V20/2021 SR3 Combo floating license download[2] Engineering software in the TIA Portal; software, documentation and license key for download; 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1500/1200/300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. -- For system requirements specification, see www.siemens.com/compatool. Consignee email address required for delivery.	**6ES7822-1AE23-0XC3**
SIMATIC STEP 7 Professional PowerPack & upgrade STEP 7 V5.7-> V20/2021 SR3; Combo floating license download[2] Engineering software in the TIA Portal; software, documentation and license key for download; 9 languages: en, de, zh included, fr, es, it, ru, ja, ko as download; for configuration of SIMATIC S7-1200/1500, SIMATIC S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. Consignee email address required for delivery	**6ES7822-1AE23-0XC5**
Software Update Service For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version	
Software Update Service (Standard Edition)[1] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)	
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC04-0YE2**
Software Update Service (Compact Edition)[1] The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. Delivery items to be combined must be ordered as one item.	
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC00-0YM2**

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Selection and ordering data (continued)

Software Update Service (download)[1][2] Upgrades and Service Packs are available for downloading. Consignee email address required for delivery	
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC04-0YY2**
MPI cable For linking SIMATIC S7 and PG through MPI (5 m)	**6ES7901-0BF00-0AA0**
Components for connecting a PC to MPI and PROFIBUS	
• For PCs with a free PCI slot:	
CP 5612	**6GK1561-2AA00**
• For PCs without a free PCI slot:	
USB A2 PC adapter For connecting a programming device/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	**6GK1571-0BA00-0AA0**
Components for connecting the PC to Industrial Ethernet	
• For PCs with a free PCI slot:	
Layer 2 Ethernet cards	

1) For more information see Software Update Service.
2) Up-to-date information and download availability can be found under this link.

Technical specifications

Article number	**6GK1571-0BA00-0AA0**
product type designation	**PC adapter USB A2**
product brand name	SIMATIC NET
Technical Product Detail Page	https://i.siemens.com/1P6GK1571-0BA00-0AA0
transfer rate	
transfer rate	
• at the 1st interface according to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
interfaces	
number of electrical connections	
• at the 1st interface according to PROFIBUS	1
number of interfaces according to USB	1
type of electrical connection	
• at the 1st interface according to PROFIBUS	9-pin Sub-D socket (RS 485)
• of the USB interface	Standard-B socket
standard for interfaces USB 2.0	Yes
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
type of voltage supply optional external power supply	No
supply voltage	
• from USB	5 V
• note	Supply direct from USB
relative symmetrical tolerance at DC	
• at 5 V	5 %
consumed current	
• from USB	0.2 A
power loss [W]	1 W
ambient conditions	
ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity at 30 °C during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
module format	USB V2.0 adapter
width	58 mm
height	26 mm
depth	105 mm
net weight	365 g
fastening method 35 mm DIN-rail mounting	No
product features, product functions, product components general	
number of plug-in cards of same design plug-in per PC station	1
number of units note	-
product functions diagnostics	
product function	
• port diagnostics	Yes
standards, specifications, approvals	
product function is supported identification link	Yes; acc. to IEC 61406-1:2022

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Technical specifications (continued)

Article number product type designation	6GK1571-0BA00-0AA0 PC adapter USB A2
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	42.7 kg
• during manufacturing	14.95 kg
• during operation	27.62 kg
• after end of life	0.13 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

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Overview

- PASCAL-type high-level language
- Optimized for programming PLCs
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 314 and CPU 312C), S7-400, C7 and WinAC



Licensing

- S7-SCL is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product.
- S7-SCL V5.7 is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.7 is available for users of the previous versions as of V5.3.
- A separate update service can be purchased for S7 SCL.
- A trial license valid for 21 days is available for download via the Industry Online Support under this link.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

SIMATIC S7-SCL, Version 5.7 **Task:** High-level language programming **Target system:** SIMATIC S7-300 (CPU 314 or higher), SIMATIC S7-400, SIMATIC C7 **Requirement:** STEP 7 from V5.7; Windows 10/11 Professional/Enterprise, Windows Server 2016/2019/2022 **Type of delivery:** On CD; English, German, French, Spanish, Italian; license key on USB flash drive, with electronic documentation	
Floating license	**6ES7811-1CC08-0YA5**
Software Update Service (requires current software version)[1]	**6ES7811-1CA01-0YX2**
Upgrade floating from V5.3 to V5.7	**6ES7811-1CC08-0YE5**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) For more information see Software Update Service.

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Technical specifications

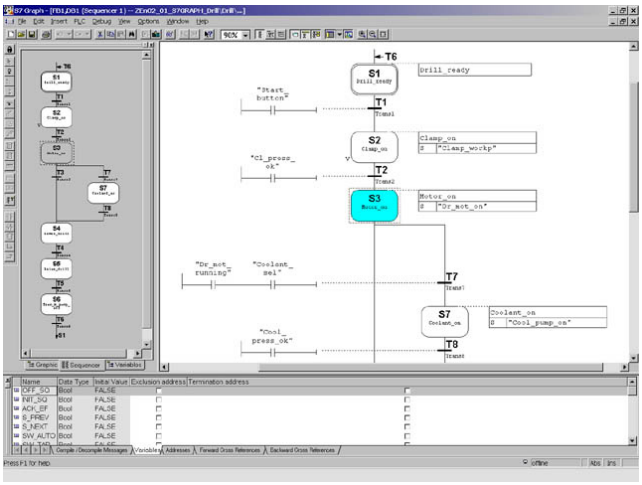
Engineering tool	S7-SCL
Current version	V5.7
Software class	A
Application areas	
Can be used for	Text-based high-level language programming of simple and complex calculations, CASE, loop, jump, and comparison functions
Marketing message	Programming of algorithms and calculations made easy!
Advantages	• Clear and easy-to-read programs • Functional, module-based programming • CASE statement replaces a large number of jump and comparison functions • Easily understood by PLC programmers, as the programming philosophy of LAD/FBD/STL is retained • Easy switchover to PLC programming for PC programmers • Exchangeability (porting) of subroutines in accordance with IEC 61131-3 • Less time required for engineering compared to LAD/FBD/STL: Up to 20% for simple programs; at least 50% for demanding program structures
Sectors	• Labeling machines • Chemical plants (e.g. oxygen extraction, evaluation of measured values) • Rubber and plastics processing machines • Woodworking machines • Storage and logistics systems • Paper and printing machinery • Punching and cutting machines • Water industry • Coilers
Target systems	
Can be used in	S7-300 (CPU 313 or higher and CPU 312C or higher recommended) S7-400 C7 (C7-626 or higher recommended) WinAC
System requirements	
Operating system	Windows 10/11 Windows Server 2016/2019/2022
Required hard drive memory in the PG/PC	50 MB
Required software	STEP 7 V5.7
Properties	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	Yes
Integration in CFC	Yes
Program runtimes	
with S7-300 (typical)	Similar to LAD/FBD/STL
with S7-400 (typical)	Similar to LAD/FBD/STL
Diagnostics	
Integration of diagnostic data in ProAgent	-
Integration of diagnostic data in ProTool/Pro	-
Integration of diagnostic data in WinCC	-
Supported standards	
IEC 61131-3	PLCopen certification • Base level ST available • Reusability Level ST available

Technical specifications (continued)

Available versions/licenses	
Floating license	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License on USB flash drive Certificate of License Product information
Upgrade (floating license)	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License on USB flash drive Certificate of License Product information
Software Update Service (SUS)	
Also a component of	
STEP 7 Professional	Yes
S7 Trainer Package	Yes
PCS 7	Yes
D7-SYS	-

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Overview



- For configuring and programming sequential processes using sequencers
- Standardized representation to EN 1131-3
- Clearly comprehensible program thanks to structuring of the process into separate steps
- With extensive diagnostic functions, integrated in the SIMATIC diagnostics concept
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 315 and CPU 312C or higher), S7-400, C7 and WinAC



Overview (continued)

Licensing

- S7 GRAPH is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product.
- S7-Graph V5.7 is supplied with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.7 is available for users of previous versions as of V5.3.
- A separate update service can be purchased for S7-GRAPH.
- A trial license valid for 21 days is available for download via the Industry Online Support under this link.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

SIMATIC S7-GRAPH, Version 5.7 **Task:** Configuring and programming of sequences **Target system:** SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7 **Requirement:** STEP 7 V5.7; Windows 10/11 Professional/Enterprise, Windows Server 2016/ 2019/2022 **Type of delivery:** on CD; German, English, French, Spanish, Italian; including license key on USB flash drive, with electronic documentation	
Floating license	**6ES7811-0CC08-0YA5**
Software Update Service (requires current software version)[1)]	**6ES7811-0CA01-0YX2**
Upgrade floating license from V5.3 to V5.7	**6ES7811-0CC08-0YE5**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) For more information see Software Update Service.

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Technical specifications

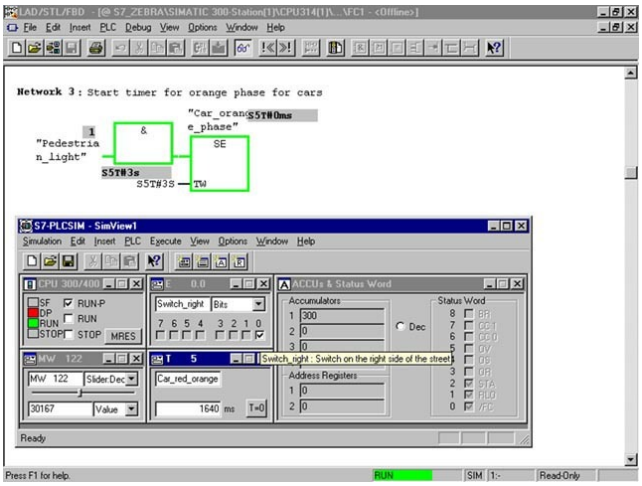
Engineering tool	**S7-GRAPH**
Current version	V5.7
Software class	A
Application areas	
Can be used for	Graphical programming of sequential controls and sequencers
Marketing message	Fast, elegant way to program sequential processes easily and transparently!
Advantages	• Can be used to optimum effect even during the design phase • Less configuration effort thanks to graphical structuring and programming • Quick and easy familiarization • Precise fault localization thanks to integrated diagnostics in combination with ProAgent for ProTool/Pro and WinCC • Less time required for engineering compared to LAD/FBD/STL: approx. 40 to 70%
Sectors	• Automotive industry (e.g. body-in-white, final assembly) • Electrical equipment manufacture • Rubber and plastics processing machines • Pick-and-place machines • Woodworking machines • Metalworking machines • Paper and printing machinery • Testing machines • Rolling mills • Coilers • Leisure and entertainment facilities
Target systems	
Can be used in	S7-300 (CPU 314 or higher and CPU 312C or higher recommended) S7-400 C7 (C7-626 or higher recommended) WinAC
System requirements	
Operating system	Windows 10/11 Windows Server 2016/2019/2022
Required hard drive memory in the PG/PC	50 MB
Required software	STEP 7 V5.7
Properties	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	Yes
Integration in CFC	-
Program runtimes	
with S7-300 (typical)	3 ms per block + 1 ms per active step
with S7-400 (typical)	0.4 ms per block + 0.06 ms per active step
Diagnostics	
Integration of diagnostic data in ProAgent	Yes
Integration of diagnostic data in ProTool/Pro	Via ProAgent
Integration of diagnostic data in WinCC	Via ProAgent
Supported standards	
IEC 61131-3	PLCopen certification • Base Level SFC available
Status of PLCopen activities	-

Technical specifications (continued)

Available versions/licenses	
Floating license	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License key on USB flash drive Certificate of License Product information
Upgrade (floating license)	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License key on USB flash drive Certificate of License Product information
Software Update Service (SUS)	
Also a component of	
STEP 7 Professional	Yes
S7 Trainer Package	Yes
PCS 7	-
D7-SYS	-

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Overview



- For functional testing of the generated SIMATIC S7 user blocks on a programming device or PC, independent of the availability of the target hardware
- Shifts the detection and correction of programming errors to an early stage of development
- Enables an accelerated and cost-effective initial commissioning and enhances the program quality
- Can be used for LAD, FBD, STL, S7-GRAPH, S7-HiGraph, S7-SCL, CFC, S7-PDIAG, WinCC (local installation)

Licensing

- S7-PLCSIM is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product
- S7-PLCSIM V5.4 is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.4 is offered for users of the previous versions.
- A separate update service can be purchased for S7-PLCSIM.
- A trial license valid for 14 days is available for download via the Industry Online Support under this link.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

S7-PLCSIM, Version 5.4 **Task:** Functional testing of SIMATIC S7 user blocks on programming device/PC **Target system:** SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7 **Requirement:** STEP 7 V5.4 or higher incl. SP4/SP5 or STEP 7 > V5.5 **Type of delivery:** on CD; English, German, French, Spanish, Italian; license key on USB flash drive, with electronic documentation	
Floating license	**6ES7841-0CC05-0YA5**
Software Update Service (requires current software version)[1]	**6ES7841-0CA01-0YX2**
Floating license upgrade to V5.4	**6ES7841-0CC05-0YE5**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

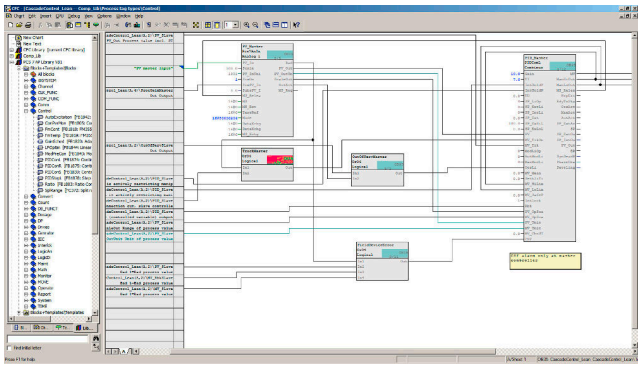
1) For more information see Software Update Service.

Technical specifications

Engineering tool	**S7-PLCSIM**
Type of license	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows 10/11 Windows Server
Required software packages	STEP 7 V5.4 with SP4 or SP5 or STEP 7 > V5.5
Disk space required in programming device/PC	5 MB

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Overview



- For the generation of automation programs by drawing a technology chart
- With extensive libraries of ready-made software blocks to which user-created blocks can be added
- Minimized outlay and reduced error susceptibility due to the interconnection of ready-made blocks
- Optimized integration in the world of automation, for example, through guaranteed compatibility with all STEP 7 tools
- Can be used for SIMATIC S7-300 (recommended for CPU 316 or CPU 314C or higher), SIMATIC S7-400, SIMATIC WinAC and D7-SYS

Licensing

- SIMATIC CFC V9.0 is supplied with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 9.0 is available for users of the previous 8.x versions.
- For SIMATIC CFC, the Software Update Service is available with the Standard, Compact and Download types of delivery.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

SIMATIC CFC, Version 9.0 **Task:** Graphic configuring and programming of automation applications in the form of technology charts **Target system:** SIMATIC S7-300/400, SIMATIC WinAC, D7-SYS **Requirements:** STEP 7 V5.6 or higher **Type of delivery:** Engineering software and electronic documentation on CD-ROM, license key on USB flash drive, Certificate of License	
Floating license	**6ES7658-1EX58-0YA5**
Floating license for download. Email address required for delivery[2]	**6ES7658-1EX58-0YH5**
Floating license upgrade from V8.x to V9.0	**6ES7658-1EX58-0YE5**
Floating license upgrade from V8.x to V9.0 for download. Email address required for delivery[2]	**6ES7658-1EX58-0YK5**
Software Update Service (requires current software version)[1]	**6ES7658-1EX00-2YL8**
Software Update Service for multiple orders (requires current software version); the delivery items are combined. For multiple contracts, only 1 package (1 data storage medium set and the corresponding number of licenses) will be supplied. Can be ordered with 5 or more contracts[1] Delivery items to be combined must be ordered as one item.	**6ES7658-1EX00-2YM8**
Software Update Service (requires current software version)[1] Email address required for delivery	**6ES7658-1EX00-2YV8**
SIMATIC Manual Collection DL in 5 languages[2] All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages[2] Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

1) For more information see Software Update Service.
2) Up-to-date information and download availability can be found under this link.

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Technical specifications

EngineringTool	**CFC**
Current version	V9.0
Software class	A
Application areas	
Can be used for	Graphical creation, interconnection and parameterization of (preconfigured) blocks and functions
Marketing message	Simply interconnect and configure instead of programming!
Advantages	• Can be used to optimum effect even during the design phase • Reduced configuration effort thanks to graphical interconnection • High degree of reusability of diagrams that have already been created • Quick and easy familiarization • Quick and transparent interconnection of ready-made functions • Technological creation of the program as a whole • Clear representation of control loop structures • Short commissioning time • High plant availability • Less time required for engineering compared to LAD/FBD/STL: up to 50%
Sectors	• Automotive industry (e.g. thermostats, tire production processes) • Chemicals • Power engineering and supply • Rubber and plastics processing machines • Metalworking machines • Food and beverage machines • Petrochemicals • Rolling mills • Water industry • Coilers
Target systems	
Can be used in	S7-300 S7-400 F/H systems WinAC
System requirements	
Operating system	MS Windows 7 Professional with SP1 (64-bit) MS Windows 7 Ultimate with SP1 (64-bit) MS Windows 7 Enterprise with SP1 (64-bit) MS Windows 10 Pro (64-bit) MS Windows 10 Enterprise 2015 LTSB (64-bit) MS Windows Server 2008 R2 Standard Edition with SP1 (64-bit) MS Windows Server 2012 R2 Update Standard Edition (64-bit)
Required hard drive memory in the PG/PC	approx. 80 MB
Required software	STEP 7 V5.6 or higher
Properties	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	-
Integration in CFC	Yes
Program runtimes	
with S7-300 (typical)	Depending on the interconnected blocks
with S7-400 (typical)	Depending on the interconnected blocks
Diagnostics	
Integration of diagnostic data in ProAgent	-
Integration of diagnostic data in ProTool/Pro	-
Integration of diagnostic data in WinCC	-
Supported standards	
IEC 61131-3	based on the IEC standard
Status of PLCopen activities	-

Technical specifications (continued)

Available versions/licenses	
Floating license	• 1 CD • 1 license key memory stick • 1 Certificate of License
Upgrade (floating license)	• 1 CD • 1 license key memory stick • 1 Certificate of License
Software Update Service (SUS)	
Also a component of	
STEP 7 Professional	-
S7 Trainer Package	-
PCS 7	Yes
D7-SYS	Yes

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Overview



- For creating safety-related automation applications with SIMATIC S7 in LAD or FBD (STEP 7 required)
- Implementation of safety functions by simply connecting function blocks
- With prefabricated block library
- Custom block creation possible
- Optimal embedding in the automation world thanks to total integration in the STEP 7 tools
- Scope of supply:
  - Distributed Safety Editor
  - Code generator
  - Debugger
  - Standard block libraries

Licensing

- SIMATIC S7 Distributed Safety is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.4 is offered for users of the previous versions 5.x.
- A trial license valid for 14 days is available for download via the Industry Online Support under this link.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

S7 Distributed Safety V5.4 SP5 Update 2 programming tool **Task:** Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP **Requirement:** Windows 7 SP1 (64-bit) Windows 10 Professional/Enterprise (64-bit) Windows Server 2008 R2 SP1 (64-bit) Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit) STEP 7 from V5.5 SP1 Please also consider the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; Email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**

[1] Up-to-date information and download availability can be found under this link.

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Overview



Safety Integrated for Process Automation is the comprehensive range of products and services from Siemens for safe, fault-tolerant applications in the process industry. This is characterized by:

- Safety-related F/FH automation systems of the S7-400 series (see "Automation Systems" section)
- Safe communication with the PROFIsafe profile via PROFIBUS (see section "Industrial Communication, PROFIBUS") or PROFINET (see section "Industrial Communication, PROFINET")
- Fail-safe transmitters (SITRANS P DS III) on the PROFIBUS PA with PROFIsafe (see Catalog FI 01, Field devices for process automation)
- ET 200SP HA, ET 200iSP, ET 200M, ET 200S and ET 200pro distributed I/O systems with safety-oriented F-I/O modules/submodules (see "Process I/O" section)
- Fail-safe process instruments/devices for connection to ET 200 distributed I/O systems (see Catalog FI 01, Field Instruments for Process Automation)
- SIMATIC Safety Integrated software for implementation and operation of safety applications, with additional components for the Engineering System and the operator stations: SIMATIC S7 F-systems, SIMATIC S7 Safety Matrix
- Special applications, for example, Partial Stroke Test
- Safety lifecycle management with support by highly qualified solution partners: services for all phases in the lifecycle of a safety instrumented system (analysis, implementation, and operation)

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Design

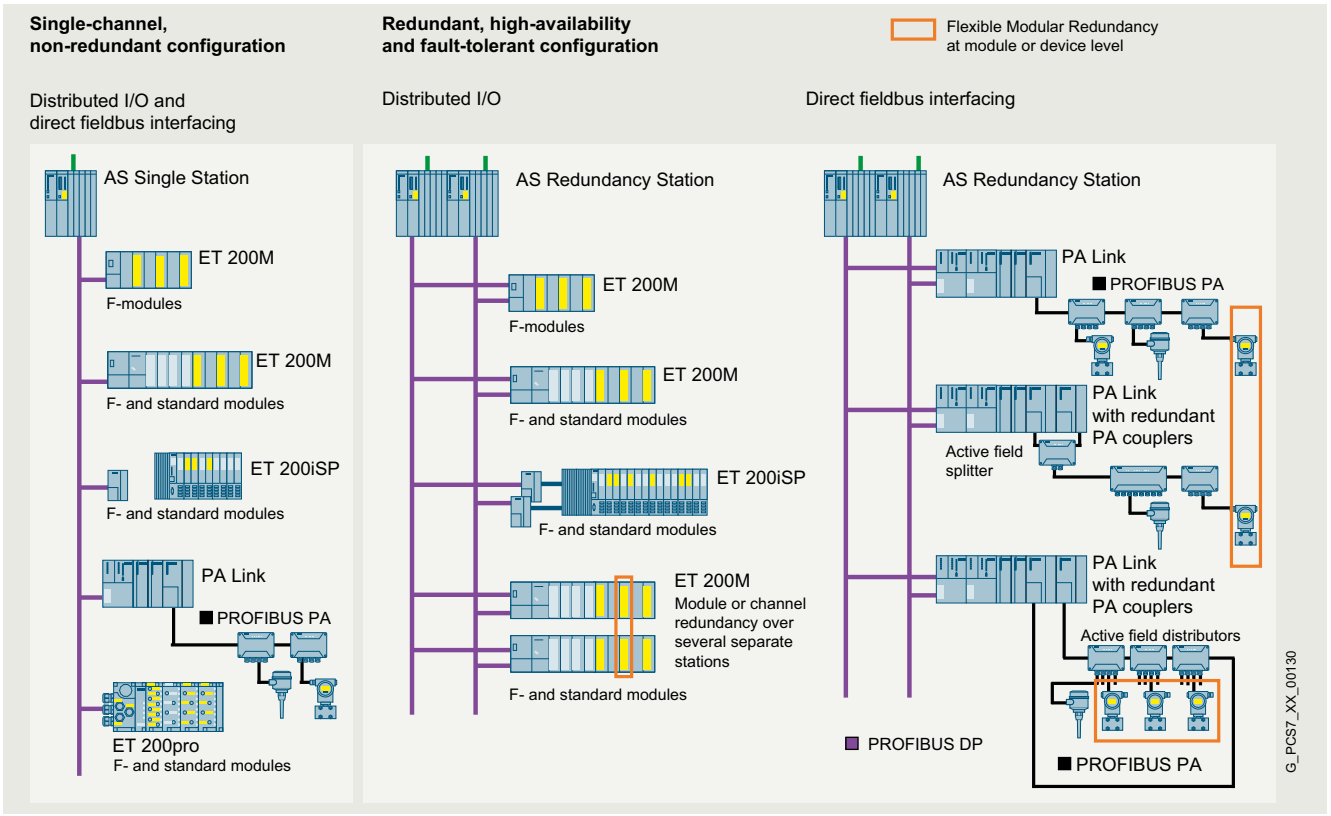
The PROFIsafe profile allows safety-related communication between the automation system (controller) and the process I/O via either PROFIBUS or PROFINET. The decision for choosing either PROFINET IO or the PROFIBUS DP/PA fieldbuses has a significant influence on the architecture of the safety-related system.

Safety-related design versions with PROFIBUS

In the case of a safety-related system with PROFIBUS communication integrated into SIMATIC PCS 7, a distinction is made across all architecture levels between two design versions:

- Single-channel, non-redundant design
- Redundant, fault-tolerant design

Both design versions are extremely variable, and offer a large scope for different customer requirements. Standard automation (basic process control) and safety-related functions can be combined flexibly, not only in the area of distributed I/O. Even at the controller level, they can be combined in one system or separated. In addition, there are numerous possibilities arising from the use of flexible modular redundancy.



Safety-related design versions with PROFIBUS

At the individual architectural levels (controller, fieldbus, I/O), you have the configuration alternatives shown in the figure in line with the I/O used (ET 200SP HA, ET 200iSP, ET 200M and ET 200pro remote I/O stations or PROFIBUS PA devices with PA profile 3.0 or higher).

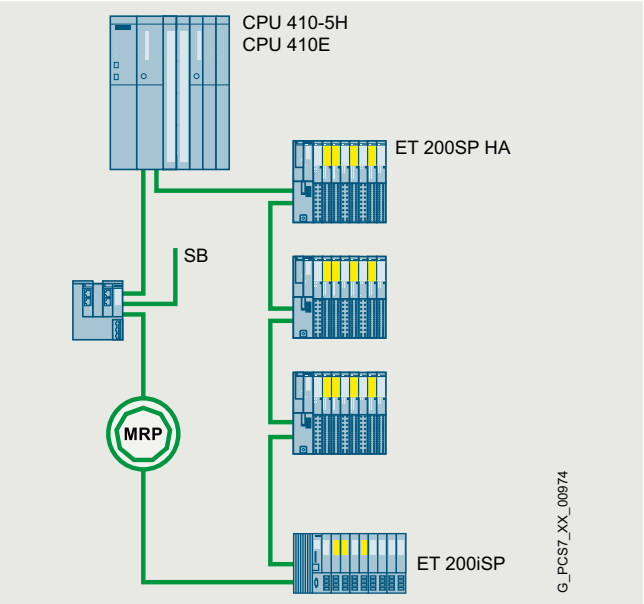
Safety-related design versions with PROFINET

Safety-related AS single stations (F systems) and AS redundancy stations (FH systems) from the S7-400 range can be networked simply and effectively with ET 200M remote I/O stations via PROFINET IO. For this purpose, the PN/IE interface integrated in the CPU and the corresponding PROFINET interface module in the remote I/O stations (e.g. IM 155-6 PN HA for ET 200SP HA) are available on the automation system side.

The availability of the I/O devices on an AS Single Station (F-system) can be increased by a ring topology with media redundancy. If the transmission link in the ring is interrupted at one point, for example, due to a break in the ring cable or the failure of a station, the redundancy manager then immediately activates the alternative communication path.

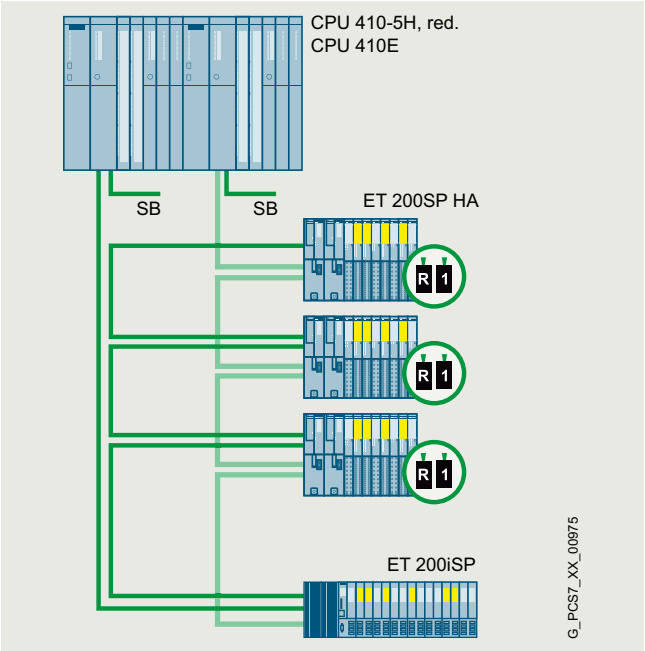
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Design (continued)



Safety-related PROFINET IO communication with media redundancy

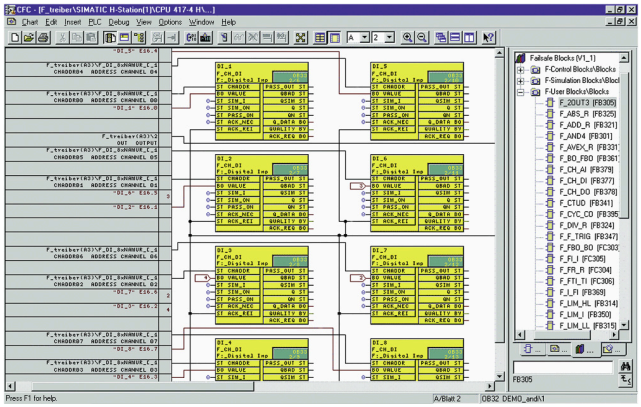
The maximum availability with minimum error handling times is achieved by the AS Redundancy Station (FH system) in conjunction with the redundant PROFINET configuration R1. From the CPUs of the H system onwards, the R1 devices are connected via two separate line structures. In order to increase availability, we recommend reverse cabling (as shown in the blueprint). In contrast to the single-sided I/O device connection to only one CPU, failure of a CPU in this case does not automatically lead to failure of the connected I/O devices.



Safety-related PROFINET IO communication with system redundancy

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Overview



The SIMATIC S7 F Systems engineering tool for configuration of safety-related SIMATIC PCS 7 automation systems and safety-related F-modules from the ET 200 range is integrated in the SIMATIC Manager. SIMATIC S7 F Systems are based on pre-configured and German Technical Inspectorate certified blocks. The following functions are then available:

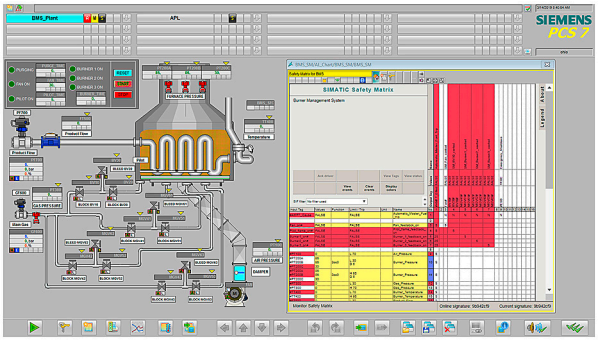
- Parameterization of CPU and F signal modules
- Creation of safety-related applications in the CFC

Selection and ordering data

SIMATIC S7 F Systems	
SIMATIC S7 F Systems V6.4 Programming and configuration environment for creating and using safety-oriented STEP 7 programs 2 languages (English, German), software class A Runs on the following operating systems • Windows 10 Enterprise 2015 LTSB (64-bit), Windows 10 Enterprise 2019 LTSC 64-bit, Windows Server 2016 Standard Edition 64-bit, Windows Server 2016 Datacenter Edition 64-bit, Windows Server 2019 Standard Edition 64-bit, Windows Server 2019 Datacenter Edition 64-bit Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 F Systems Software Media Package per order item	**6ES7833-1CC46-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC S7 F Systems Software Media Package (software download and online Certificate of License) Note: Email address required	**6ES7833-1CC46-0YH5**
SIMATIC S7 F Systems Software Media Package	
SIMATIC S7 F Systems Software Media Package V6.4 Installation software without license 2 languages (English, German), software class A Runs on the following operating systems: • Windows 10 Enterprise 2015 LTSB 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, Windows Server 2016 Standard Edition 64-bit, Windows Server 2016 Datacenter Edition 64-bit, Windows Server 2019 Standard Edition 64-bit, Windows Server 2019 Datacenter Edition 64-bit Without SIMATIC PCS 7 Software Media Package Note: Can only be used in conjunction with a valid license.	
• Goods delivery Software on DVD and Certificate of License	**6ES7833-4CC46-0YT8**
• Online delivery Software download and online Certificate of License Note: Email address required!	**6ES7833-4CC46-0YG8**
Upgrades for SIMATIC S7 F Systems See "Upgrades for Safety Integrated for Process Automation" in section "Update/upgrade packages", "Updates/upgrades asynchronous to the PCS 7 version". Note: With a SIMATIC S7 F Systems Upgrade from V5.x to V6.x, the type of SIMATIC S7 F Systems License changes from single license to floating license.	

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Overview



Process image of an operator station with the SIMATIC S7 Safety Matrix Viewer displayed

The SIMATIC S7 Safety Matrix, which can be used in addition to the CFC, is an innovative safety lifecycle tool from Siemens that can be used not only for user-friendly configuration of safety applications, but also for their operation and service. The tool, which is based on the proven principle of a cause & effect matrix, is ideally suited to processes where defined states require specific safety reactions.

The SIMATIC S7 Safety Matrix means that programming of the safety logic is not only significantly simpler and more convenient, but also much faster than conventional processes. During the risk analysis of a plant, the configuration engineer can assign precisely defined reactions (effects) to events (causes) which may occur during a process.

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Selection and ordering data

SIMATIC S7 Safety Matrix Runs with the following operating systems (see SIMATIC S7 Safety Matrix V6.3 Readme for the latest information): • On engineering station under: - MS Windows 7 SP1 (64-bit) (Ultimate, Enterprise, Professional) - MS Windows 10 Enterprise 2015 LTSB - MS Windows 10 Enterprise 2019 LTSC - MS Windows Server 2008 R2 SP1 - MS Windows Server 2012 R2 Standard - MS Windows Server 2016 Standard - MS Windows Server 2019 Standard • On operator station (for Safety Matrix Viewer) under: - MS Windows 7 Ultimate SP1 (32-bit) - MS Windows 7 SP1 (64-bit) (Ultimate, Enterprise, Professional) - MS Windows 10 Enterprise 2015 LTSB - MS Windows 10 Enterprise 2019 LTSC - MS Windows Server 2008 R2 SP1 - MS Windows Server 2012 R2 Standard - MS Windows Server 2016 Standard - MS Windows Server 2019 Standard	
SIMATIC S7 Safety Matrix Tool V6.3 Creation, configuration, compilation and loading of the SIMATIC S7 Safety Matrix as well as operator control and monitoring in a SIMATIC PCS 7 environment 2 languages (German, English), software class A, floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 Safety Matrix Software Media Package per order item	**6ES7833-1SM03-0YA5**
• Online delivery License key download and online Certificate of License, combined with SIMATIC S7 Safety Matrix Software Media Package (software download and online Certificate of License) Note: Email address required; installation software also available separately as SIMATIC S7 Safety Matrix Software Media Package.	**6ES7833-1SM03-0YH5**
SIMATIC S7 Safety Matrix Viewer V6.3 For operator control and monitoring of the SIMATIC S7 Safety Matrix via OS Single Station/OS Client Runtime software, 2 languages (German, English), software class A, floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 Safety Matrix Software Media Package per order item	**6ES7833-1SM63-0YA5**
• Online delivery License key download and online Certificate of License, combined with SIMATIC S7 Safety Matrix Software Media Package (software download and online Certificate of License) Note: Email address required; installation software also available separately as SIMATIC S7 Safety Matrix Software Media Package.	**6ES7833-1SM63-0YH5**

Selection and ordering data (continued)

SIMATIC S7 Safety Matrix Software Media Package	
SIMATIC S7 Safety Matrix Software Media Package V6.3 (incl. SP) Installation software without license, 2 languages (German, English), software class A Without SIMATIC PCS 7 Software Media Package Note: Can only be used in conjunction with a valid license.	
• Goods delivery Software on DVD and Certificate of License	**6ES7833-4SM36-0YT8**
• Online delivery Software download and online Certificate of License Note: Email address required!	**6ES7833-4SM36-0YG8**
Upgrades for SIMATIC S7 Safety Matrix Tool and SIMATIC S7 Safety Matrix Viewer See "Safety Integrated Upgrades for Process Automation", chapter "Update/upgrade packages", section "Updates/upgrades asynchronous to the PCS 7 version"	

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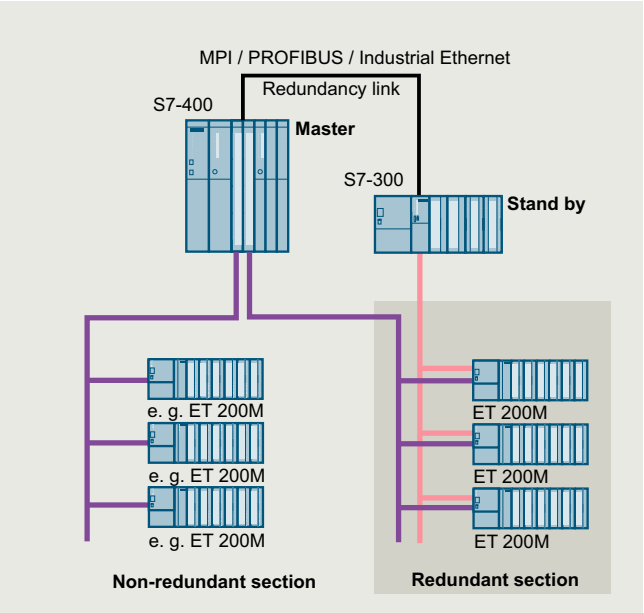
Technical specifications

	Safety lifecycle support	Operating modes	Hardware requirements	Software requirements
SIMATIC S7 Safety Matrix Tool V6.3	Complete lifecycle: • Analysis phase • Implementation phase • Operation and maintenance phase	Offline, online	SIMATIC PCS 7 with safety-related automation systems (SIMATIC S7 F Systems RT license integrated) Installation basis: SIMATIC PCS 7 Engineering Station	• Microsoft Windows operating system (in line with the software requirements of the SIMATIC PCS 7 version) • For offline testing: S7-PLCSIM or SIMIT • SIMATIC S7 F Systems V6.1 SP2 and higher
SIMATIC S7 Safety Matrix Viewer V6.3	Operating phase (operator control and monitoring)	Online	SIMATIC PCS 7 with safety-related automation systems (SIMATIC S7 F Systems RT license integrated) Installation basis: SIMATIC PCS 7 Operator Station, single station or client version	Microsoft Windows operating system (in line with the software requirements of the SIMATIC PCS 7 version)

System requirements for SIMATIC S7 Safety Matrix

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Overview



- Software package for assembling fault-tolerant control systems based on software
- Designed for control systems with single-channel distributed I/O
- For use in applications with low demands on changeover speed, such as the control of hydroelectric power plants, cooling circuits, traffic flows, level control, measured data acquisition
- Inexpensive thanks to the use of standard S7-300 and S7-400 components
- I/O linking with PROFIBUS DP in redundant configuration
- Optional control via WinCC operator station

Selection and ordering data

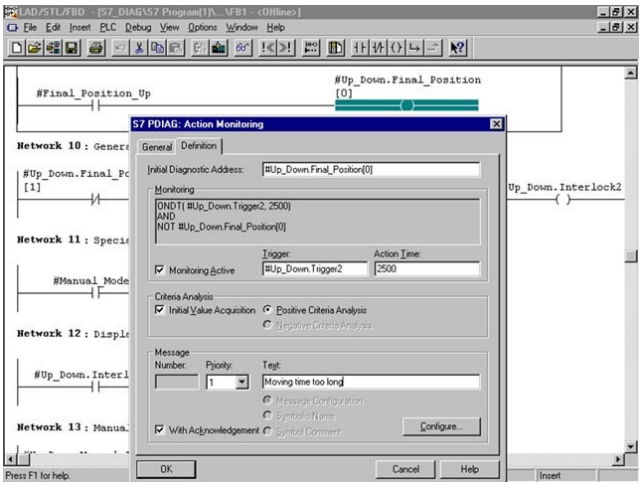
Program package software redundancy V1.2 **Task:** Configuring a redundant control. Target system: SIMATIC S7-300, S7-400 **Requirement:** STEP 7 V5.2, NCM S7 for PROFIBUS **Type of delivery:** incl. electronic documentation (English, German, French, Spanish, Italian), 4 application examples and faceplate for WinCC on CD-ROM	
Single license (for 2 CPUs)	**6ES7862-0AC01-0YA0**
Single license, without software and documentation	**6ES7862-0AC01-0YA1**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

Technical specifications

Technical specifications	
Hardware requirements	
CPU	S7-300: CPU 313C-2 DP, 314C-2 DP, 315-2 DP, 316-2 DP, 318-2 DP S7-400: all CPUs
Redundancy link of the CPUs	MPI, PROFIBUS, Industrial Ethernet; existing connections can also be used
Usable modules for ET 200M	IM 153-2; all DI/O, AI/O for ET 200M; FM 350-1 counter module; CP 341
Software requirements	
Configuration/programming	STEP 7 V4.0
Communication configuration for redundant PROFIBUS DP	NCM S7 for PROFIBUS

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Overview



- For configuration of process diagnostics with SIMATIC S7
- Increases the availability of machines and production plants and provides supports with fault analysis and elimination on-site
- For use on the SIMATIC S7-300, S7-400

Licensing

- S7-PDIAG V5.7 is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.7 is available for users of previous versions.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

S7-PDIAG, Version 5.7 **Task:** Configuring of process diagnostics for LAD/FBD/STL **Target system:** SIMATIC S7-300 (CPU 314 and higher); SIMATIC S7-400 **Requirement:** From STEP 7 V5.7; Windows Server 2016/2019/2022, Windows 10/11 Professional, Windows 10/11 Enterprise **Type of delivery:** on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation	
Floating license	**6ES7840-0CC08-0YA5**
Software Update Service (requires current software version)[1)]	**6ES7840-0CA01-0YX2**
Upgrade to V5.7	**6ES7840-0CC08-0YE5**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

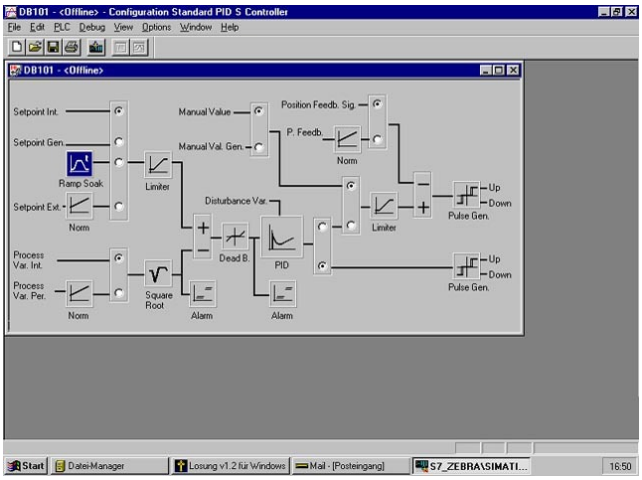
1) For more information see Software Update Service.

Technical specifications

Engineering tool	**S7-PDIAG**
Type of license	Floating license
Software class	A
Current version	V5.7
Target system (recommended)	SIMATIC S7-300 (CPU 314 or higher) SIMATIC S7-400
Operating system	Windows Server 2016/2019/2022, Windows 10/11 Professional, Windows 10/11 Enterprise
Required software packages	STEP 7 V5.7 or higher
Disk space required in programming device/PC	26 MB

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Overview



- For integrating continuous PID controllers, pulse controllers and step controllers in the application program
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

Licensing

- The Standard PID Control consists of a parameterization tool (engineering software) and function blocks (runtime software).
- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required for each CPU on which they are used.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

Standard PID Control parameterization tool, V5.2 **Task:** Parameter assignment tool for standard controllers **Requirement:** STEP 7 V5.6 or higher **Type of delivery:** With electronic manual/Getting Started English, German; incl. authorization diskette	
Floating license	**6ES7830-2AA22-0YX0**
Standard function blocks for Standard PID Control, V5.2 **Task:** Standard FBs for standard controllers **Target system:** SIMATIC S7-300 (CPU 313 or higher), S7-400 **Type of delivery:** With electronic manual/Getting Started English, German	
Single license	**6ES7860-2AA21-0YX0**
Single license without software and documentation	**6ES7860-2AA21-0YX1**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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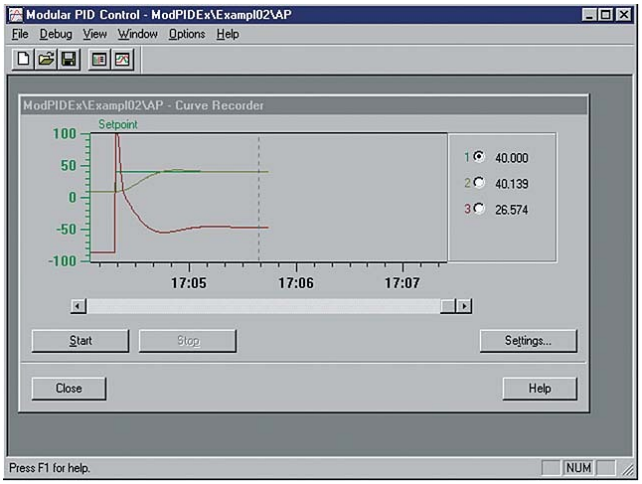
Technical specifications

Parameterization software	Standard PID Control					
Type of license	Single license					
Software class	A					
Current version	V5.2 SP4					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7					
Required software packages	STEP 7 V5.6 or higher					
Main memory configuration in PG/PC	16 MB					
Disk space required in PG/PC	1.85 MB					
Standard function blocks	**PID_CP (FB 1)**		**PID_ES (FB 2)**		**LP_SCHED (FC 1)**	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	8956 bytes	7796 bytes	9104 bytes	7982 bytes	1064 bytes	976 bytes
• DB length in the memory	1168 bytes	510 bytes	1124 bytes	484 bytes	184 bytes[2)]	100 bytes[2)]
Runtimes						
• In S7-300[1)]	0.18 - 4.4 ms		0.2 - 5.1 ms		0.03 - 0.3 ms	
• In S7-400[1)]	0.13 - 0.35 ms		0.16 - 0.35 ms		0.03 - 0.08 ms	
Required libraries	Standard PID Control FBs					
Licensing forms	Simple license and 1 runtime license; 1 runtime license					
Software class	A					
Current version	V5.2 SP3					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7					
Required software packages	STEP 7 V5.6 or higher					
Main memory configuration in PG/PC	16 MB					
Disk space required in PG/PC	1.85 MB					

1) Depending on the CPU
2) With 5 control loops

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Overview



- For creating complex closed-loop control structures
- Preferred for implementation in closed-loop control equipment in mid-range and high-end applications and in process engineering
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

Licensing

- The Modular PID Control consists of a parameterization tool (engineering software) and function blocks (runtime software).
- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required for each CPU on which they are used.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

Modular PID Control commissioning tool, V5.1 for SIMATIC S7 and WinAC **Task:** Commissioning tool for modular PID controllers **Requirement:** STEP 7 V5.6 or higher **Type of delivery:** With electronic manual, English, German; incl. authorization diskette	
Floating license	**6ES7830-1AA11-0YX0**
Standard function blocks for Modular PID Control, V5.1 **Task:** Standard FBs for modular PID controllers **Target system:** SIMATIC S7-300 (CPU 313 or higher), S7-400, WinAC **Type of delivery:** English, German; with electronic manual	
Single license	**6ES7860-1AA10-0YX0**
Single license, without software and documentation	**6ES7860-1AA10-0YX1**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Technical specifications

Parameterization software	Modular PID Control
Type of license	Single license
Software class	A
Current version	V5.1 SP4
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7
Required software packages	STEP 7 V5.6 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB
Processor, at least	486
Windows swap area, approx.	20 MB (max. possible)

Standard function blocks	A_DEAD_B		CRP_IN		CPR_OUT	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	898 bytes	692 bytes	182 bytes	70 bytes	206 bytes	96 bytes
• DB length in the memory	186 bytes	44 bytes	122 bytes	20 bytes	114 bytes	14 bytes
Runtimes in S7-300	0.13 to 0.17 ms		0.06 ms		0.18 to 0.22 ms	
Runtimes in S7-400	0.01 to 0.03 ms		0.01 to 0.02 m		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	DEAD_T		DEAD_BAND		DIF	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	532 bytes	394 bytes	232 bytes	120 bytes	410 bytes	268 bytes
• DB length in the memory	142 bytes	22 bytes	114 bytes	16 bytes	158 bytes	30 bytes
Runtimes in S7-300	0.26 to 0.33 ms		0.16 to 0.21 ms		0.55 to 0.71 ms	
Runtimes in S7-400	0.02 to 0.06 m		0.01 to 0.03 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	ERR_MON		INTEG		LAG1ST	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	558 bytes	360 bytes	488 bytes	314 bytes	534 bytes	368 bytes
• DB length in the memory	206 bytes	52 bytes	168 bytes	36 bytes	156 bytes	30 bytes
Runtimes in S7-300	0.27 to 0.35 ms		0.40 to 0.51 ms		0.52 to 0.67 ms	
Runtimes in S7-400	0.01 to 0.05 ms		0.02 to 0.07 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

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Technical specifications (continued)

Standard function blocks	LAG2ND		LIMALARM		LIMITER	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	690 bytes	516 bytes	390 bytes	240 bytes	262 bytes	140 bytes
• DB length in the memory	190 bytes	46 bytes	152 bytes	28 bytes	124 bytes	20 bytes
Runtimes in S7-300	0.88 to 1.14 ms		0.47 to 0.61 ms		0.14 to 0.17 ms	
Runtimes in S7-400	0.04 to 0.16 ms		0.02 to 0.07 ms		0.03 to 0.01 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	LMNGEN_C		LMNGEN_S		NONLIN	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1576 bytes	1280 bytes	2578 bytes	2152 bytes	826 bytes	672 bytes
• DB length in the memory	276 bytes	80 bytes	360 bytes	110 bytes	138 bytes	18 bytes
Runtimes in S7-300	0.32 to 0.41 ms		1.16 to 1.47 ms		0.32 to 0.41 ms	
Runtimes in S7-400	0.02 to 0.06 ms		0.06 to 0.18 ms		0.02 to 0.07 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	NORM		OVERRIDE		PARA_CTL	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	234 bytes	122 bytes	362 bytes	214 bytes	406 bytes	232 bytes
• DB length in the memory	130 bytes	24 bytes	146 bytes	28 bytes	234 bytes	82 bytes
Runtimes in S7-300	0.33 to 0.43 ms		0.15 to 0.18 ms		0.12 to 0.15 ms	
Runtimes in S7-400	0.02 to 0.07 ms		0.01 to 0.04 ms		0.01 to 0.03 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	PID		PULSEGEN		RMP_SOAK	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1560 bytes	1242 bytes	1110 bytes	872 bytes	1706 bytes	1500 bytes
• DB length in the memory	340 bytes	98 bytes	190 bytes	34 bytes	212 bytes	62 bytes
Runtimes in S7-300	1.15 to 1.46 ms		0.17 to 0.20 ms		0.16 to 0.20 ms	
Runtimes in S7-400	0.06 to 0.18 ms		0.01 to 0.05 ms		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

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Technical specifications (continued)

Standard function blocks	ROC_LIM		SCALE		SP_GEN	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1242 bytes	980 bytes	136 bytes	32 bytes	658 bytes	484 bytes
• DB length in the memory	222 bytes	50 bytes	114 bytes	16 bytes	164 bytes	40 bytes
Runtimes in S7-300	0.53 to 0.68 ms		0.10 to 0.13 ms		0.27 to 0.35 ms	
Runtimes in S7-400	0.02 to 0.09 ms		0.01 to 0.02 ms		0.02 to 0.06 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	SPLT_RAN		SWITCH		LP_SCHED	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	304 bytes	180 bytes	238 bytes	116 bytes	1104 bytes	972 bytes[1)]
• DB length in the memory	138 bytes	28 bytes	118 bytes	18 bytes	234 bytes	64 bytes[1)]
Runtimes in S7-300	0.09 to 0.11 ms		0.07 to 0.09 ms		0.28 to 0.34 ms	
Runtimes in S7-400	0.01 to 0.02 ms		0.01 to 0.03 ms		0.03 to 0.08 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

1) With 5 control loops

Standard FBs in general	
Required libraries	Modular PID Control FBs
Licensing forms	Simple license and 1 runtime license; 1 runtime license
Software class	A
Current version	V5.1 SP3
Required software packages	STEP 7 V5.6 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB

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Overview



- PID Self-Tuner: For expanding existing PID controllers to create self-tuning PI or PID controllers.
- Optimization of PI or PID controllers with 3-step action (HEATING – OFF – COOLING)
- Convenient online initial setting and online adaptation during operation
- Ideally applicable to temperature controllers, but also suitable for level and flow controllers
- Can be used with SIMATIC S7-300 (CPU 313 or higher), SIMATIC S7-400 and WinAC; in combination with PID Control (integrated in STEP 7), Standard PID Control, Modular PID Control, FM 355, FM 455 as well as with any PID algorithm

Licensing

- The PID Self-Tuner complements the Standard PID Control or Modular PID Control software packages.
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required for each CPU on which they are used.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager here: this link.

Selection and ordering data

PID Self-Tuner V5.1 **Task:** Online tuning for PID controller **Target system:** SIMATIC S7-300 (CPU 313 or higher), S7-400, WinAC **Type of delivery:** Standard function blocks, electronic manual and Getting Started English/German	
Single license	**6ES7860-4AA01-0YX0**
Single license, without software and documentation	**6ES7860-4AA01-0YX1**
SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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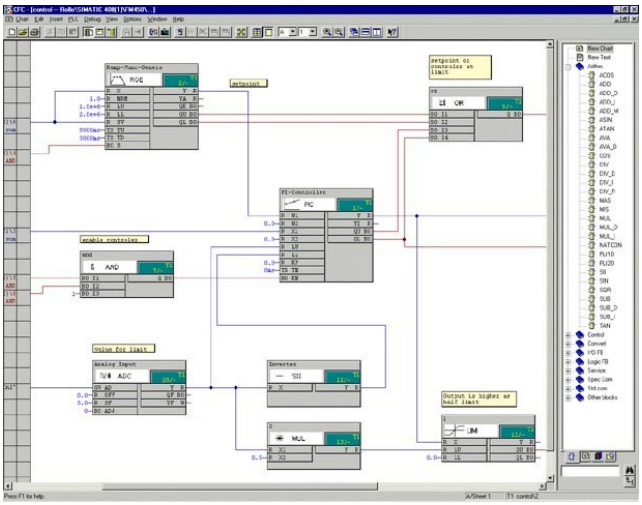
Technical specifications

Parameterization software	PID Self-Tuner			
Type of license	-			
Software class	-			
Current version	-			
Target system	-			
Operating system	-			
Required software packages	-			
Main memory configuration in PG/PC	-			
Disk space required in PG/PC	-			
Standard FBs	-			
PID Self-Tuner	**TUN_EC**		**TUN_ES**	
Storage space requirements	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	approx. 6542 bytes	approx. 5956 bytes	6332 bytes	5714 bytes
• DB length in the memory	644 bytes	294 bytes	638 bytes	288 bytes
Runtimes				
• In S7-300	1.0 ms to 1.5 ms [1]		1.0 ms to 1.5 ms [1]	
• In S7-400	0.06 ms to 0.19 ms [1]		0.06 ms to 0.19 ms [1]	
Required libraries	PID Self-Tuner FBs V5.1			
Licensing forms	-			
Software class	A			
Current version	V5.1 SP3			
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7-620			
Required software packages	STEP 7 V5.6 or higher			
Main memory configuration in PG/PC	-			
Disk space required in PG/PC	-			

1) Depending on the CPU selected

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Overview



- Optional package for STEP 7 V5.7 SP2 for configuring closed-loop control and automation tasks with SIMATIC TDC
- Extensive block library
- Generation of user libraries in ANSI C with D7-FB-GEN function block generator

Licensing

- D7-SYS is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 10.0 is offered for users of previous versions V9.1 or higher.
- A separate Software Update Service can be purchased for D7-SYS.
- As of version 8.1, the D7-FB-GEN block generator that was previously sold separately is included in the D7-SYS scope of delivery.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

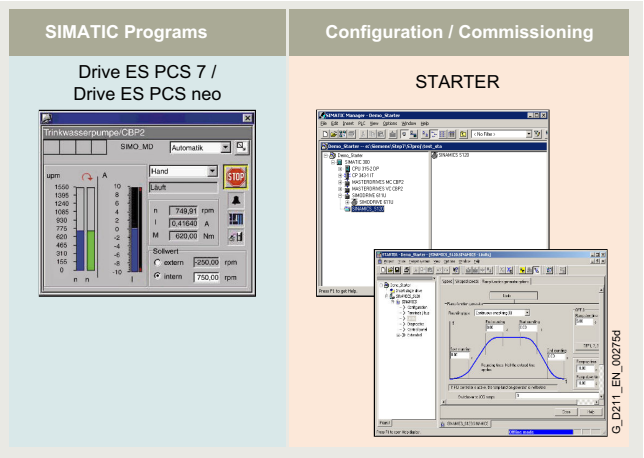
Selection and ordering data

SIMATIC D7-SYS V10.0	
Reference hardware: SIMATIC TDC **Requirements:** MS Windows 10 Pro and Enterprise (64-bit); MS Windows 11 Pro and Enterprise (64-bit); MS Windows Server 2019 Standard Edition (64-bit); MS Windows Server 2022 Standard Edition (64-bit); STEP 7 V5.7 **Type of delivery:** On DVD, en, de, with electronic documentation	
Floating license	**6ES7852-0CC08-0YA5**
Upgrade license from V9.1 to V10.0	**6ES7852-0CC08-0YE5**
Software Update Service[1)]	**6ES7852-0CC01-0YL5**

1) For more information see Software Update Service.

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Overview



Drive ES/STARTER is the engineering system used to integrate the communication, configuration and data management functions of Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively.

The following software packages are available for selection:

- STARTER
- SIMATIC PDM with FDI Device Package
- Drive ES PCS 7

The Drive ES (**D**rive **E**ngineering **S**oftware) fully integrates drives from Siemens into the world of Totally Integrated Automation (STEP 7 V5.x).

- Drive ES PCS neo Add-On

Drive ES PCS neo integrates drives from Siemens into the world of SIMATIC PCS neo system.

Selection and ordering data

Drive ES PCS 7

Description	Article No.
Drive ES PCS 7 V9.1 SPx *) Block library for PCS 7 for the integration of drives in Classic Style (as predecessor) Requirement: PCS 7 V9.1 or higher Type of delivery: DVD-ROM Languages: en, de, fr, it, es With electronic documentation	
• Single-user license incl. 1 runtime license	**6SW1700-2JD00-0AA0**
• Runtime license (on paper)	**6SW1700-5JD00-1AC0**
• Runtime license (eCoL)	**6SW1700-5JD00-1AH0**
• Update service for single-user license	**6SW1700-0JD00-0AB2**
• Upgrade from V6.x/V7.x/V8.x/V9.x to V9.1 SPx *)	**6SW1700-2JD00-0AA4**
Drive ES PCS 7 APL V9.1 SPx *) Block library for PCS 7 for the integration of drives in APL Style (Advanced Process Library) Requirement: PCS 7 V9.1 or higher Type of delivery: DVD-ROM Languages: en, de, fr, it, es With electronic documentation	
• Single-user license incl. 1 runtime license	**6SW1700-2JD01-0AA0**
• Runtime license (on paper)	**6SW1700-5JD00-1AC0**
• Runtime license (eCoL)	**6SW1700-5JD00-1AH0**
• Update service for single-user license	**6SW1700-0JD01-0AB2**
• Upgrade of Drive ES PCS 7 APL V8.x, V9.x to V9.1 SPx *)or Drive ES PCS 7 V6.x, V7.x, V8.x, V9.x classic to Drive ES PCS 7 APL V9.1 SPx *)	**6SW1700-2JD01-0AA4**
Drive ES PCS 7 V10.0 SPx *) Block library for PCS 7 for the integration of drives in Classic Style (as predecessor) Requirement: PCS 7 V10.0 or higher Type of delivery: DVD-ROM, OSD Languages: en, de, fr, it, es With electronic documentation	
• Single-user license incl. 1 runtime license (DVD-ROM)	**6SW1700-3JD00-0AA0**
• Single-user license incl. 1 runtime license (OSD)	**6SW1700-3JD00-0AG0**
• Runtime license (on paper)	**6SW1700-5JD00-1AC0**
• Runtime license (eCoL)	**6SW1700-5JD00-1AH0**
• Update service for single-user license	**6SW1700-0JD00-0AB2**
• Upgrade from V8.x/V9.x to V10.0 SPx *) for DVD-ROM	**6SW1700-3JD00-0AA4**
• Upgrade from V8.x/V9.x to V10.0 SPx *) for OSD	**6SW1700-3JD00-0AG4**
Drive ES PCS 7 APL V10.0 SPx *) Block library for PCS 7 for the integration of drives in APL Style (Advanced Process Library) Requirement: PCS 7 V10.0 or higher Type of delivery: DVD-ROM, OSD Languages: en, de, fr, it, es With electronic documentation	
• Single-user license incl. 1 runtime license (DVD-ROM)	**6SW1700-3JD01-0AA0**
• Single-user license incl. 1 runtime license (OSD)	**6SW1700-3JD01-0AG0**
• Runtime license (on paper)	**6SW1700-5JD00-1AC0**
• Runtime license (eCoL)	**6SW1700-5JD00-1AH0**
• Update service for single-user license	**6SW1700-0JD01-0AB2**
• Upgrade from V8.x/V9.x to V10.0 SPx *) for DVD-ROM	**6SW1700-3JD01-0AA4**
• Upgrade from V8.x/V9.x to V10.0 SPx *) for OSD	**6SW1700-3JD01-0AG4**

*) Orders are automatically supplied with the latest Service Pack (SP).

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Selection and ordering data (continued)

Drive ES PCS 7 Software Update Service

A software update service can also be purchased for the Drive ES PCS 7 software. The user will automatically receive the latest software, service packs and full versions for one year after ordering.

The update service can only be ordered in addition to an existing (i.e. previously ordered) full version.

• Period of update service: 1 year

The update service is automatically extended by 1 further year unless canceled up to 6 weeks prior to expiration.

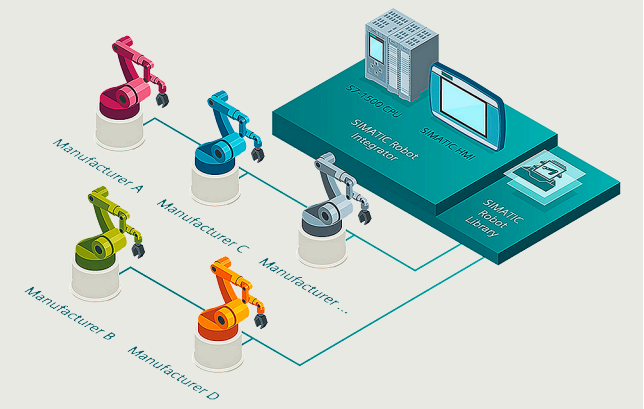
Description	Article No.
Drive ES PCS 7	
• Update service for single-user license	**6SW1700-0JD00-0AB2**
Drive ES PCS 7 APL	
• Update service for single-user license	**6SW1700-0JD01-0AB2**

Drive ES PCS neo

Description	Article No.
Drive ES PCS neo V4.1 Add-On for SIMATIC PCS neo for the integration of SINAMICS drives Requirement: PCS neo V4.1 License reference for the license code and the Certificate of License for the Drive ES PCS neo Add-On via OSD Languages: de, en, fr, it, es, zh, ja	**6SW1700-2JE01-0AH0**
Drive ES PCS neo V5.0 Add-On for SIMATIC PCS neo for the integration of SINAMICS drives Requirement: PCS neo V5.0 License reference for the license code and the Certificate of License for the Drive ES PCS neo Add-On via OSD Languages: de, en, fr, it, es, zh, ja	**6SW1750-1CE00-0YA0**
Drive ES PCS neo V6.0 SP1 Add-On for SIMATIC PCS neo for the integration of SINAMICS drives Requirement: PCS neo V6.0 and V6.0 SPx License reference for the license code and the Certificate of License for the Drive ES PCS neo Add-On via OSD Languages: de, en, fr, it, es, zh, ja	**6SW1750-1CE01-0YA0**
Runtime license Drive ES PCS neo Add-On SINAMICS library To execute the function blocks for an additional SIMATIC PCS neo Controller Language-neutral, single license for 1 installation Type of delivery: Electronic Certificate of License (OSD)	**6SW1750-2CE00-0YB0**

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Overview



With the SIMATIC Robot Library, robot arms of different robot manufacturers can be programmed consistently in the Totally Integrated Automation Portal (TIA Portal).

The SIMATIC Robot Library concept moves the command sets of a robot control to the TIA Portal, thus enabling manufacturer-independent and consistent programming of industry robots (incl. cobots) in the TIA Portal for the first time. The programs can be run on a SIMATIC S7-1500 Controllers. Additional programming on the robot control is not necessary.

Note:

The SIMATIC Robot Library can be supplemented by the free application example SIMATIC Robot Integrator. This offers a comprehensive user interface for industry robots incl. configuration, teaching, jog mode and diagnostics for SIMATIC HMI.

System requirements

- SIMATIC STEP 7 (TIA Portal) V19 or higher for SIMATIC S7-1500 as of firmware V2.8 and on SIMATIC S7-1500S as of firmware V20.8.
- SIMATIC STEP 7 (TIA Portal) V19 or higher for SIMATIC S7-1500V as of firmware V3.1.
- Interpreter software from the respective robot manufacturer on the robot control required.

Licensing

- A Single Runtime License is required for each controlled robot arm.
- The licenses can only be obtained via Online Software Delivery (OSD). The download contains the software and a license certificate for a robot arm. For information on activating the license, please read the Readme file included in the download.
- The SIMATIC Robot Library V1.2 can also be requested as trial version via the Siemens Industry Online Support or Technical Support and can then be used free of charge for 2 hours.
- The Interpreter software for the respective robot control is made available by the respective robot manufacturer. Siemens has no influence on the Interpreter license model of the robot manufacturer. Therefore, please contact the relevant robot manufacturer directly (if you wish, Siemens can assist you with finding a contact person).

Selection and ordering data

SIMATIC Robot Library V1.2 STEP 7 (TIA Portal) runtime option for consistent programming of robot arms of various robot manufacturers in the Totally Integrated Automation Portal (TIA Portal). **Requirement:** SIMATIC STEP 7 (TIA Portal) V19 or higher for SIMATIC S7-1500 as of firmware V2.8 and on SIMATIC S7-1500S as of firmware V20.8. SIMATIC STEP 7 (TIA Portal) V19 or higher for SIMATIC S7-1500V as of firmware V3.1; Interpreter software from the respective robot manufacturer on the robot control required	
Single Runtime License Download[1] contains license certificate for 1 robot alarm Consignee email address required for delivery.	**6ES7825-0AE00-3AA0**

[1] Up-to-date information and download availability can be found under this link.

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Overview



The Windows application SIMATIC Robot Simulator provides an SRCI-based universal virtual robot controller (VRC). It can be used to simulate SRCI-supporting robot arms from different manufacturers. The SIMATIC Robot Library is also required for this purpose.

The SIMATIC Robot Library concept shifts robot programming to the Totally Integrated Automation Portal (TIA Portal) and thus the program of industrial robots (including cobots) to a SIMATIC S7-1500 controller.

This makes the robot program also executable in SIMATIC S7-PLCSIM Advanced, which makes it possible to simulate robot applications with the SIMATIC Robot Simulator.

Note

The SIMATIC Robot Simulator can be supplemented by the free application example SIMATIC Robot Integrator. This offers a comprehensive user interface for industrial robots incl. configuration, teaching, jog mode and diagnostics with SIMATIC HMI.

System requirements

- Processor: Intel Core I7™ - 6820EQ (or equivalent); one core is recommended for each robot arm instance running at the same time
- RAM: 6 GB
- Hard disk: 5 GB
- Minimum graphics memory: 500 MB
- Minimum screen resolution: 1024 x 1024
- SIMATIC S7-PLCSIM Advanced V6.0 or higher

Licensing

- A floating license is required for up to five simultaneously running robot arm instances.
- Licenses are valid for 365, 180, or 90 days, depending on the type.
- The licenses can only be obtained via Online Software Delivery (OSD).
- The SIMATIC Robot Simulator V1.1.0.0 can also be requested as a trial version via Siemens Industry Online Support or Technical Support and can then be used with limited functionality.
- To use the SIMATIC Robot Simulator, the SIMATIC Robot Library is required as a trial or licensed.

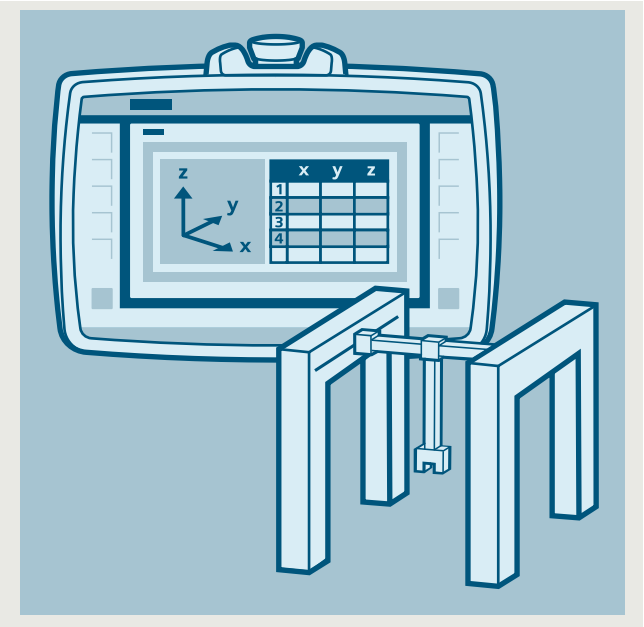
Selection and ordering data

SIMATIC Robot Simulator V1.1.0.0 SRCI-based universal, virtual robot controller (Windows application) for simulating robot arms from different manufacturers that support SRCI with the aid of the SIMATIC Robot Library. **Prerequisite:** SIMATIC Robot Library ≥ V1.0.0.2 SIMATIC S7-PLCSIM Advanced ≥ V6.0 Processor: Intel Core I7™ -6820EQ (or equivalent), one core is recommended for each robot arm instance running at the same time RAM: 6 GB Hard disk space: 5 GB Minimum graphics memory: 500 MB Minimum screen resolution: 1024 x 1024 **Runs on:** Windows 10	
Floating license download for 365 days [1] Contains license certificate for up to 5 simultaneously running robot arm instances Consignee email address required for delivery.	**6ES7825-1AE00-0YA8**
Floating license download for 180 days [1] Contains license certificate for up to 5 simultaneously running robot arm instances Consignee email address required for delivery.	**6ES7825-1AE00-0YA7**
Floating license download for 90 days [1] Contains license certificate for up to 5 simultaneously running robot arm instances Consignee email address required for delivery.	**6ES7825-1AE00-0YA3**

[1] Up-to-date information and download availability can be found at: https://www.siemens.com/tia-online-software-delivery

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Overview



With the SIMATIC Cartesian Portal, kinematics can be configured, programmed and operated with up to 6 positioning axes with synchronous point-to-point control (sPTP).
The Plug & Play solution comprises a convenient user interface for programming, diagnostics and operation of the kinematics via the HMI.

The SIMATIC Cartesian Portal V1.0 software solution consists of a TIA Portal project and a library project for the TIA Portal V17 and V18.

SIMATIC Cartesian Portal V1.0 contains the following HMI configuration functions:

- Channel-granular configuration of the kinematics and additional axes;
  Per channel, up to 6 axes and additionally up to 25 further axes are available for multi-axis positioning with sPTP. The number of channels is only limited by the performance and the memory of the PLC.
- Axis configuration;
  The dynamic parameters, the axis limits and the homing of the different axes can be configured.
- Tag and I/O configuration;
  Bool and Real tags can be created. Logical step enabling conditions consisting of multiple inputs and tags can be combined into one Boolean tag. Digital inputs and outputs can be configured via the I/O address.
- Points table;
  By means of input or teaching of axis positions, path points can be defined that can be used for programming the kinematics.
- Zone configuration;
  Multiple restricted zones can be created in the workspace as protection zones. These are checked cyclically against both the target coordinates and the current axis values. A violation leads to a stop response of the axes.

The program editor offers the following functions:

Overview (continued)

- Synchronous point-to-point commands;
  All axes are traversed synchronously with multi-axis positioning. The destination is specified either using the points table or by direct input with optional blending.
- Single axis commands;
  The additional axes can be homed, positioned, torque-limited or speed-controlled.
- Wait functions;
  Step enabling conditions, based on a digital input, a Bool tag or a wait time, can be programmed.
- Calculate tags and assign values;
  Digital outputs can be set via an input mask. In addition, floating point tags can be calculated, incremented or assigned absolute values.
- Program control structures;
  Labels, branches, loops and parallel sequences allow flexible program design.

SIMATIC Cartesian Portal V1.0 is executable on SIMATIC S7-1511T for V17 and SIMATIC S7-1511 for V18. Details on scalability and quantity structures can be found in the documentation.

System requirements

- SIMATIC STEP 7 Professional (TIA Portal) as of V17
- SIMATIC WinCC Advanced ES as of V17

Licensing

- SIMATIC Cartesian Portal is available as Runtime option for TIA Portal. A license is required for each CPU on which SIMATIC Cartesian Portal runs.
- The product can only be ordered via Online Software Delivery (OSD). The download contains the license certificate and the software.
- The following additional licenses are required to use SIMATIC Cartesian Portal:
  - SIMATIC STEP 7 Professional (TIA Portal) as of V17
  - SIMATIC WinCC Advanced ES as of V17

Selection and ordering data

SIMATIC Cartesian Portal V1.0 Single Runtime license download includes license certificate; programming and control of multi-axis kinematics with sPTP for 2-6 positioning axes; executable on SIMATIC S7-1500(F) from SIMATIC S7-1511 upwards, including user operating concept Consignee email address required for delivery	**6ES7823-0GE01-1AA0**

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Overview



SIMATIC Robot Pick AI (robot capability) is a pre-trained, Deep Learning-based image processing software for advanced robotics applications that provides out-of-the-box cognitive performance for selecting rugged pick points (6-DOF gripping poses) for arbitrary "unknown" items in boxes at runtime. It is a generic capability for arbitrary objects. Specific training through CAD models is not required.
Suitable, for example, for robotic solutions for unit load removal in intralogistics.

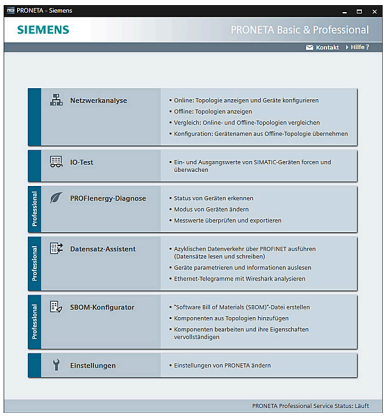
Selection and ordering data

SIMATIC Robot Pick AI V1.1 AI vision software for pick-by-robot applications with TIA Portal integration, single license, product download includes: Certificate of License (CoL), AI vision software package, STEP 7 (TIA Portal) FBs and documentation[1]. Tested industrial PCs: SIMATIC IPC BX-39A, SIMATIC S7-1500 TM MFP. Supported 3D cameras: IDS Ensenso N-series, Zivid 2 L100, Intel RealSense D400. License is activated via the responsible sales contact.	**6ES7865-0AD10-1AA0**

[1] Up-to-date information and download availability can be found at this link.

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Overview



Asset management and diagnostics with PRONETA Professional

The recording of devices in automation systems is a complex and time-consuming task. The information regarding the components used is becoming increasingly important for plant operators to ensure stable operation. In addition, there are legal requirements to create an SBOM (Software Bill of Material) for machines, plants, etc.

PRONETA Professional takes this task off the user's hands and supports machine and plant builders, operators, and maintenance personnel in recording the details of their used components. Networks can be automatically scanned at regular intervals, thus transparently documenting the plant configuration. With the SBOM function, the prerequisite for continuous vulnerability management is created. Additionally, the Dataset Assistant offers the possibility to send PROFINET datasets to PROFINET devices via acyclic communication.

Licenses

- The software can be installed on one computer (single license).

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

Selection and ordering data

PRONETA Professional V2.0	
Software for asset management with API, PROFIenergy diagnostics, data record wizard; 3 languages en/de/cn, can be run under Windows 10 (64-bit) and Windows 11 (64 Bit)	
Single license; software, documentation and license for download	**6ES7853-2BE02-0YA0**
Single license upgrade from V1.x to V2.0; software, documentation and license for download	**6ES7853-2BE02-0YE0**

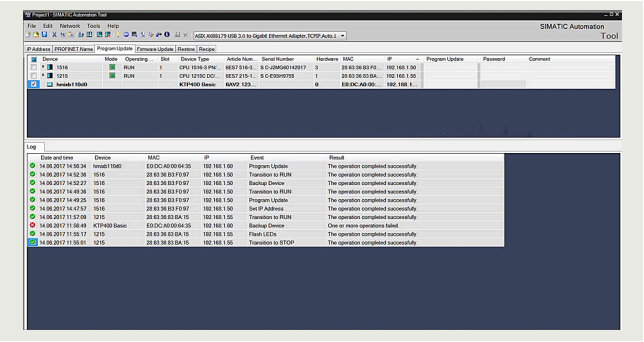
Technical specifications

PRONETA Professional V2.0 can be used on the following operating systems:

- Microsoft Windows 10 (64-bit)
- Microsoft Windows 11 (64-bit)

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Overview



- To support commissioning and service activities independent of the engineering framework
- For configuration, operation, maintenance and documentation of automation networks
- Rapid overview of the status of the SIMATIC automation system
- Time savings thanks to parallel operations (license required)
- Optimum upgrade support for the devices used and their versions through the display of article numbers, firmware versions and HW versions
- Simple traceability of performed operations and resulting changes in the system through the optional, automatic storage of event log entries in a file
- Automated processes for optimum API-based workflows (license required)

Supported products:

- SIMATIC ET 200
  - ET 200AL IM
  - ET 200AL SM and IO-Link
  - ET 200eco
  - ET 200M IM
  - ET 200MP IM
  - ET 200S IM
  - ET 200pro IM
  - ET 200pro IO-Link and RFID
  - ET 200SP CPU
  - ET 200SP IM and server modules
  - ET 200SP SM, AS-i, CM, CP, TM, IO-Link, motor starters
- SIMATIC S7-1200
  - S7-1200 CPU
  - S7-1200 SM and CM
- SIMATIC S7-1500
  - S7-1500 CPU
  - S7-1500 SM and other modules

Overview (continued)

- SIMATIC HMI
  - HMI Basic 2nd Generation
  - HMI Comfort
  - HMI Mobile
- SITOP power supplies
- RFID and MOBY
- SCALANCE

Licenses

- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The following license types are provided:
  - 21-day trial license (without license key); download as a registered customer from this link.
  - SIMATIC Automation Tool – Basic scope of functions
  - SIMATIC Automation Tool Advanced – extended scope of functions, including:
    - Scheduler for planning device operations at a specific time and with selectable frequency
    - Card browser for working with files and folders on SIMATIC Memory Cards in CPUs
    - Extended options for handling SIMATIC Automation Tool projects - Archiving of SAT projects and associated file data
    - Support of devices downstream from a NAT router
    - Possibility to insert multiple devices in one operation
    - Support of CPUs connected via a CM (communications module) or CP (communications processor)
    - Firmware installation in 2 sequences - Option to download the firmware update files to devices and activate the new firmware at a later time.
- SIMATIC Automation Tool Advanced PowerPack V3/V4 upgrade to Advanced V4 - License key upgrade for activating the extended V4 functions based on an available V3/V4 license key.

You can find more information on the Software Update Service, license types, Online Software Delivery and handling your SW licenses with the Automation License Manager under this link.

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Selection and ordering data

SIMATIC Automation Tool Basic V5.0, floating license download Software for commissioning and service of machines and plants; software, documentation and license key for downloading; Conformance Class A; 6 languages: en, de, fr, es, it, zh; Executable under Windows 10 and Windows 11 (64-bit) Consignee email address required for delivery	**6ES7853-1AE05-0YA5**
SIMATIC Automation Tool Advanced V5.0 floating license download Commissioning and service software for machines and extended scope of functions (e.g. scheduler, support for devices downstream from a NAT router, archiving function for SAT projects and associated file data); Software, documentation and license key for downloading[1]; Conformance Class A; 6 languages: en, de, fr, es, it, zh; Executable under Windows 10 and Windows 11 (64 bit); Consignee email address required for delivery	**6ES7853-1AE15-0YA5**
SIMATIC Automation Tool Advanced V5; PowerPack SIMATIC Automation Tool Basic -> SIMATIC Automation Tool Advanced Floating license download; software for commissioning and servicing machines and plants; Conformance Class A; Software, documentation and license key for downloading[1]; 6 languages: en, de, fr, es, it, zh; Windows 10 and 11 (64-bit); Consignee email address required for delivery	**6ES7853-1AE05-0YC5**
SIMATIC Automation Tool SDK V5.0 Windows 10 and Windows 11 (64-bit)	**6ES7853-1AE05-0AG8**
SIMATIC Automation Tool SDK V5.0 Debian 11, Ubuntu 20, 22 and Industrial OS 3.3	**6ES7853-1LE05-0AG8**

1) Up-to-date information and download availability can be found at this link.

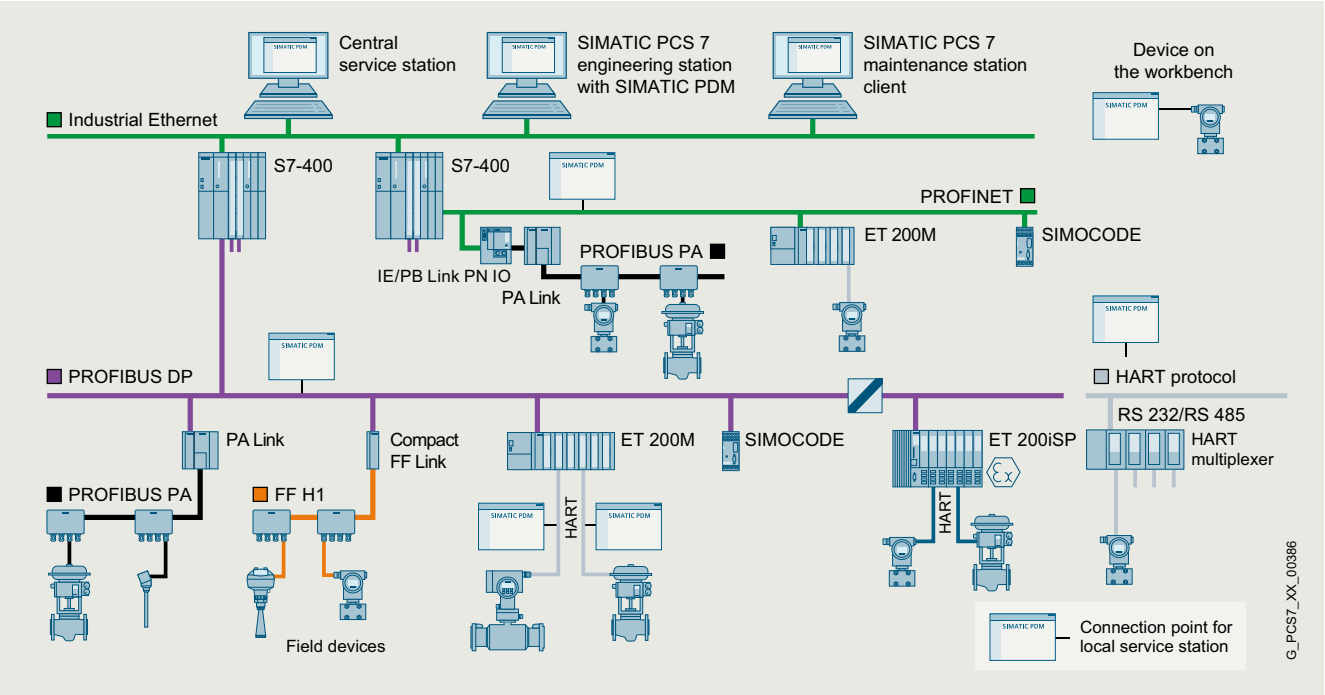
Technical specifications

The SIMATIC Automation Tool can be used on the following operating systems (64-bit only):

- Windows 7 Home Premium SP1 (only V3.1)
- Windows 7 Professional SP1 (only V3.1)
- Windows 7 Enterprise SP1 (only V3.1)
- Windows 7 Ultimate SP1 (only V3.1)
- Windows 10 Home
- Windows 10 Pro
- Windows 10 Enterprise
- Windows 10 IoT Enterprise

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Overview



Configuration options with SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, vendor-independent tool for the configuration, parameter assignment, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control room devices, compact controllers, compact modules), which in the following sections will be referred to simply as devices.

With *one* software product, SIMATIC PDM enables users to work with over 4 500 devices and device variants of Siemens and over 200 other manufacturers worldwide on a *single* homogeneous user interface.

The user interface satisfies the requirements of the VDI/VDE GMA 2187 and IEC 65/349/CD directives. Parameters and functions for all supported devices are displayed in a consistent and uniform fashion independent of their communications interface. Even complex devices with several hundred parameters can be represented clearly and processed quickly. Using SIMATIC PDM it is very easy to navigate in highly complex stations such as remote I/Os and even connected field devices.

From the viewpoint of device integration, SIMATIC PDM is the most powerful open process device manager on the global market. Devices not previously supported can be integrated in SIMATIC PDM by importing their device description packages (either EDD or FDI). This provides security for your investment and saves you investment costs, training expenses and follow-up costs.

SIMATIC PDM supports the operative system management in particular through:

- Uniform representation and operation of devices
- Uniform representation of diagnostics information
- Indicators for preventive maintenance and servicing
- Detection of changes in the project and device
- Increasing the operational reliability
- Reducing the investment, operating and maintenance costs
- Quantity options for
  - Transfer of parameters between devices
  - Transfer of parameter sets to the devices
  - Export and import functions
  - Diagnostics update

SIMATIC PDM can be used extremely flexibly and tailored to a specific task for field device service:

- Single-point station for point-to-point connection to field devices
- Local service and parameter assignment station with connection to fieldbus segments
- Central service and parameter assignment station with connection to plant bus
- Central HART service and parameter assignment station for HART multiplexers and WirelessHART field devices
- Integrated into the stand-alone SIMATIC PDM Maintenance Station
- Integrated into the SIMATIC PCS 7 process control system

Maintenance personnel can assign field device parameters at mobile and stationary workstations with SIMATIC PDM. Practically every workstation integrated in the production plant can be used for

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Overview (continued)

configuration. Service personnel are thus able to work directly at the location of the field device, while data is stored centrally in the engineering station or maintenance station. This leads to a significant shortening of maintenance and travel times. Additional device-independent system functions support higher-level maintenance stations for creating progress lists for work and servicing.

When a maintenance station is configured in the SIMATIC PCS 7 process control system, SIMATIC PDM is integrated into it and transmits parameter data, diagnostic information and processing information. You can switch directly to the SIMATIC PDM views from the diagnostics faceplates in the maintenance station to perform diagnostics and work on the device in more detail.

A SIMATIC PDM user administration system based on SIMATIC Logon is used to assign various roles with defined function privileges to users. These function privileges refer to SIMATIC PDM system functions, e.g. writing to the device.

For all devices integrated with device description packages, SIMATIC PDM provides a range of information for display and further processing on the maintenance station, for example:

- Device type information (electronic rating plate)
- Detailed diagnostics information (manufacturer information, information on error diagnostics and troubleshooting, further documentation)
- Results of internal condition monitoring functions
- Status information (for example local configuration changes), device test completed
- Information on changes (Audit Trail report)
- Parameter information

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Selection and ordering data

SIMATIC PDM Stand alone product packages	
Minimum configuration	
SIMATIC PDM Single Point V9.2 including 1 TAG; product package for operation and configuration of one field device; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET Additional functions or SIMATIC PDM TAGs are not possible 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3HA78-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3HA78-0YH5**
Basic configuration for individual product packages	
SIMATIC PDM Basic V9.2 including 4 TAGs; product package for operation and configuration of field devices and components; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3AB78-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3AB78-0YH5**

Selection and ordering data (continued)

Configuration for a local service and parameter assignment station	
SIMATIC PDM Service V9.2 Product package for service and measuring circuit tests on a local service station, with • SIMATIC PDM Basic incl. 4 TAGs • 50 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3JD78-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3JD78-0YH5**
Configuration for a central service and parameter assignment station	
SIMATIC PDM Stand-alone Server V9.2 Product package for service and device management in plant units, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Server - 2 × SIMATIC PDM 1 Client - 100 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), single license for 1 installation Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3TX78-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3TX78-0YH5**
SIMATIC PDM system-integrated product packages	

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Selection and ordering data (continued)

Configuration for integration in SIMATIC S7 configuration environment	
SIMATIC PDM S7 V9.2 Product package for use in a SIMATIC S7 configuration environment, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Integration in STEP 7/PCS 7 - 100 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3KD78-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3KD78-0YH5**
Configuration for integration in SIMATIC PCS 7 configuration environment	
SIMATIC PDM PCS 7 V9.2 Product package for use in a SIMATIC PCS 7 configuration environment 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information) Floating license for 1 user, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Integration in STEP 7/PCS 7 - SIMATIC PDM Routing - 100 TAGs Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3LD78-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3LD78-0YH5**
SIMATIC PDM PCS 7-FF V9.2 Product package for use in a SIMATIC PCS 7 configuration environment, including FOUNDATION Fieldbus H1 communication 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information) Floating license for 1 user, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Integration in STEP 7/PCS 7 - SIMATIC PDM Routing - SIMATIC PDM Communication FOUNDATION Fieldbus - 100 TAGs Without SIMATIC PCS 7 Software Media Package	

Selection and ordering data (continued)

• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3MD78-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3MD78-0YH5**
SIMATIC PDM PCS 7 Server V9.2 Product package for use in a SIMATIC PCS 7 configuration environment, including server functionality 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information) Single license for 1 installation, with - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Integration in STEP 7/PCS 7 - SIMATIC PDM Routing - SIMATIC PDM Server - 100 TAGs Without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License, bundle with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3TD78-0YA5**
• Online delivery License key download and online Certificate of License combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3TD78-0YH5**
Optional product components for SIMATIC PDM	
SIMATIC PDM Extended V9.2 For enabling additional system functions 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3NX78-2YB5**
• Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online Certificate of License Note: Email address required!	**6ES7658-3NX78-2YH5**

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Selection and ordering data (continued)

SIMATIC PDM Integration in STEP 7/SIMATIC PCS 7 V9.2 For integration in a SIMATIC S7/SIMATIC PCS 7 configuration environment 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3BX78-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3BX78-2YH5**
SIMATIC PDM Routing V9.2 For plant-wide navigation to field devices 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3CX78-2YB5**
• Online delivery License key download, online Certificate of License Note: Email address required!	**6ES7658-3CX78-2YH5**
SIMATIC PDM Server V9.2 For activating the server functionality 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), single license for 1 installation Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive, Certificate of License	**6ES7658-3TX78-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3TX78-2YH5**
SIMATIC PDM Communication FOUNDATION Fieldbus V9.2 For communication with field devices on FOUNDATION Fieldbus H1 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3QX78-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3QX78-2YH5**

Selection and ordering data (continued)

SIMATIC PDM HART Server V9.2 For using HART multiplexers as well as for configuration of WirelessHART field devices 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information), floating license for 1 user Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3EX78-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3EX78-2YH5**
SIMATIC PDM Command Interface V9.2 Use of remote control of SIMATIC PDM with 1 × SIMATIC PDM 1 Client Note: Special conditions of purchase and supply	
• Goods delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key on USB flash drive and Certificate of License	**6ES7658-3SX78-2YB5**
SIMATIC PDM 1 Client Cumulative client license for SIMATIC PDM configurations with SIMATIC PDM Server, software class A, single license for 1 installation	
• Goods delivery License key on USB flash drive and Certificate of License	**6ES7658-3UA00-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	**6ES7658-3UA00-2YH5**
SIMATIC PDM TAGs TAG licenses for expanding the available TAG volume, cumulative, software class A, floating license for 1 user	
• Goods delivery License key on USB flash drive and Certificate of License	
- 10 TAGs	**6ES7658-3XC00-2YB5**
- 100 TAGs	**6ES7658-3XD00-2YB5**
- 1 000 TAGs	**6ES7658-3XE00-2YB5**
• Online delivery License key download and online Certificate of License Note: Email address required!	
- 10 TAGs	**6ES7658-3XC00-2YH5**
- 100 TAGs	**6ES7658-3XD00-2YH5**
- 1 000 TAGs	**6ES7658-3XE00-2YH5**

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Selection and ordering data (continued)

SIMATIC PDM Software Media Package	
SIMATIC PDM Software Media Package V9.2 Installation software without license, 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 10 Professional 64-bit, Windows 10 Enterprise 2019 LTSC 64-bit, for operation within the product family SIMATIC PCS 7 the specifications there take precedence, (see SIMATIC PDM V9.2 Readme for the latest information) Without SIMATIC PCS 7 Software Media Package Note: Can only be used in conjunction with a valid license or in demo mode!	
• Goods delivery SIMATIC PDM and device library software on DVD	**6ES7658-3GX78-0YT8**
• Online delivery SIMATIC PDM and device library software download Note: Email address required!	**6ES7658-3GX78-0YG8**

Technical specifications

SIMATIC PDM V9.2	
Hardware	• PG/PC/notebook with processor corresponding to operating system requirements
Operating system (alternatives)	• Windows 10 Professional • Windows 10 Enterprise 2019 LTSC • When integrated, specifications for SIMATIC PCS 7 take precedence
Integration in STEP 7/PCS 7	• SIMATIC PCS 7 V8.1/V8.2 (without Communication FOUNDATION Fieldbus) • SIMATIC PCS 7 V9.x
SIMATIC PDM Client	• Microsoft Internet Explorer 10 or 11 • Google Chrome

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Overview

The User Management Component (UMC) provides the possibility of central user management. Through the connection to the TIA Portal, users and user groups can be defined and managed across projects. Connection to a Microsoft Active Directory is also possible.

Licensing

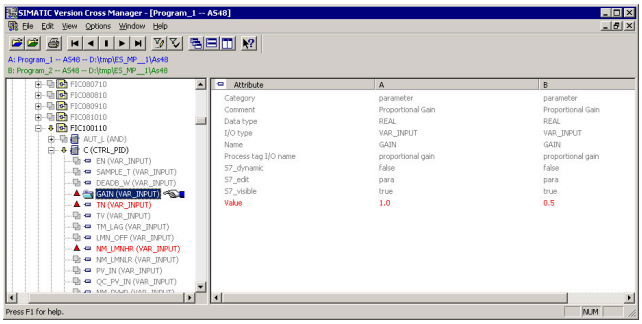
- Central user management (UMC) is part of the scope of delivery of TIA Portal.
- The license model depends on the number of user accounts per UMC domain.
- Up to ten user accounts can be used without a license.
- For additional user accounts, 365-day rental licenses and single licenses are available to add to the required number of centrally managed users.

Selection and ordering data

Central user management (UMC)	
Software component to implement central user management, included in the scope of supply of the respective products (e.g. TIA Portal). The license model depends on the number of user accounts per UMC domain. Use of max. 10 user accounts possible without a license. 6 languages: de, en, fr, es, it, zh; executable on Windows 10 (21H2 or later), Windows 11 (21H2 or later), Windows Server 2019, Windows Server 2022 (21H2 or later)	
• Rental license 365 days with license certificate for 100 user accounts	**6ES7823-1UE30-0YA0**
• Rental license 365 days with license certificate for 4 000 user accounts	**6ES7823-1UE10-0YA0**
• Single license with license certificate for 100 user accounts	**6ES7823-1UE31-0YA0**
• Single license with license certificate for 1000 user accounts	**6ES7823-1UE21-0YA0**
• Single license with license certificate for 4000 user accounts	**6ES7823-1UE11-0YA0**

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Overview



The SIMATIC Version Cross Manager is a user-friendly tool for determining the differences between various versions of individual projects or multiprojects by:

- Tracing missing, additional or differing objects by comparing hardware configuration, communication, plant hierarchy, CFC/SFC charts, SFC details, block types, messages, global tags, signals and run sequences
- Graphic display of comparison results in a combination of tree and tabular formats
- Clear hierarchical structuring according to the technological hierarchy of the plant
- Color-coded identification of the differences

Note:

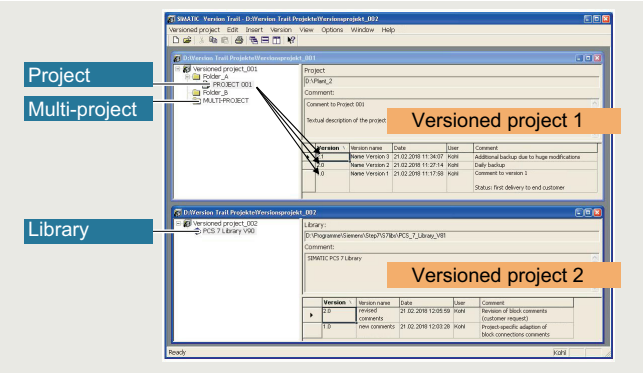
As the function "Control module adjustment" is based on a basic functionality of the Version Cross Manager (VXM), you need a VXM license to use this function. In the absence of a license, a message appears telling you to install Version Cross Manager. This is not actually necessary, all you need to install is a valid VXM license that will enable the relevant functionality on the engineering station.

Selection and ordering data

SIMATIC Version Cross Manager V9.0 6 languages (English, German, French, Italian, Spanish, Chinese), software class A Runs with the following operating systems (see VXM Readme in the Siemens Industry Online Support for the latest information) • Windows 7 Ultimate 64-bit • Windows 10 Enterprise 2015 LTS 64-bit • Windows Server 2012 R2 Standard Edition 64-bit • Windows Server 2016 Standard Edition 64-bit Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive and Certificate of License as well as TIA Engineering Toolset CD	**6ES7658-1CX58-2YA5**
• Online delivery License key download, online Certificate of License and TIA Engineering Toolset (software download) Note: Email address required!	**6ES7658-1CX58-2YH5**
Upgrade package (only for TIA applications)	
SIMATIC Version Cross Manager upgrade from V7.1/V8.2 to V9.0 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, for operating systems see above Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive, Certificate of License and TIA Engineering Toolset CD	**6ES7658-1CX58-2YE5**
• Online delivery License key download, online Certificate of License and TIA Engineering Toolset (software download) Note: Email address required!	**6ES7658-1CX58-2YK5**

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Overview



SIMATIC Version Trail is a software option for engineering which, together with the SIMATIC Logon central user administration, can assign a version history to libraries, projects and multiprojects.

Selection and ordering data

SIMATIC Version Trail V9.0 6 languages (English, German, French, Italian, Spanish, Chinese), software class A Runs with the following operating systems (see VT Readme in the Siemens Industry Online Support for the latest information) • Windows 7 Ultimate 64-bit • Windows 10 Enterprise 2015 LTS 64-bit • Windows Server 2012 R2 Standard Edition 64-bit • Windows Server 2016 Standard Edition 64-bit Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive, Certificate of License and TIA Engineering Toolset CD	**6ES7658-1FX58-2YA5**
• Online delivery License key download, online Certificate of License and TIA Engineering Toolset (software download) Note: Email address required!	**6ES7658-1FX58-2YH5**
Upgrade package (only for TIA applications)	
SIMATIC Version Trail Upgrade V8.x to V9.0 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, for operating systems see above Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Goods delivery License key on USB flash drive, Certificate of License	**6ES7658-1FX58-2YE5**
• Online delivery License key download, online Certificate of License and TIA Engineering Toolset (software download) Note: Email address required!	**6ES7658-1FX58-2YK5**

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Overview



Siemens offers industry-standard AI solutions for supporting employees and improving machine performance in critical planning and production processes. This enables customers to make quick and confident decisions and to increase their productivity significantly.

In detail, the following offer is available:

- Applications
  Vertical and application-specific software (bundles) and related services for solving a specific customer problem
- Consultation
  Various offers regarding AI enablement, co-creation and guidance
- Engineering
  Software tools and software-as-a-service (SaaS) offers on every aspect of data, creation, provision and operation of your AI

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Overview



SIMATIC Robot Pick AI (robot capability) is a pre-trained, Deep Learning-based image processing software for advanced robotics applications that provides out-of-the-box cognitive performance for selecting rugged pick points (6-DOF gripping poses) for arbitrary "unknown" items in boxes at runtime. It is a generic capability for arbitrary objects. Specific training through CAD models is not required.
Suitable, for example, for robotic solutions for unit load removal in intralogistics.

Selection and ordering data

SIMATIC Robot Pick AI V1.1 AI vision software for pick-by-robot applications with TIA Portal integration, single license, product download includes: Certificate of License (CoL), AI vision software package, STEP 7 (TIA Portal) FBs and documentation[1)]. Tested industrial PCs: SIMATIC IPC BX-39A, SIMATIC S7-1500 TM MFP. Supported 3D cameras: IDS Ensenso N-series, Zivid 2 L100, Intel RealSense D400. License is activated via the responsible sales contact.	**6ES7865-0AD10-1AA0**

1) Up-to-date information and download availability can be found at this link.

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Overview





Inspekto – AI-Driven Visual Quality Inspection System Provides dynamic AI guided optimization – no special expertise required. Self-contained system designed to be installed quick and easily to enhancing your production quality faster than any other product. Our system is designed with end user independence in mind using a do-it-yourself approach. No dedicated vision or AI know-how required.

Selection and ordering data

SIEMENS INSPEKTO Vision Inspection System Basic V6 Optical AI-supported system for presence and deviation detection. Supports 6 active profiles. Consignee email address required for delivery. Only the specific terms apply, see this link.	**6ET2901-0AA00-1BA0**
SIEMENS INSPEKTO Vision Inspection System Basic V6 - High Performance Edition Optical AI-supported system for presence and deviation detection. Supports 6 active profiles. Consignee email address required for delivery. Only the specific terms apply, see this link.	**6ET2901-1AA00-1BA0**
SIEMENS INSPEKTO Vision Inspection System Professional V6 Optical AI-supported system for presence and deviation detection. Supports unlimited number of active profiles. Consignee email address required for delivery. Only the specific terms apply, see this link.	**6ET2901-0AA01-1BA0**
SIEMENS INSPEKTO Vision Inspection System Professional V6 - High Performance Edition Optical AI-supported system for presence and deviation detection. Supports unlimited number of active profiles.Consignee email address required for delivery.Only the specific terms apply, see this link.	**6ET2901-1AA01-1BA0**
Inspekto Flex Bundle Basic SP limited to 6 profiles standard performance (no GPU), no camera - no SmartLight Note: for supported cameras see manual	**6ET2900-0AA00-0BA0**
Inspekto Flex Bundle Basic HP limited to 6 profiles standard performance (no GPU), no camera - no SmartLight Note: for supported cameras see manual	**6ET2900-1AA00-0BA0**
Inspekto Flex Bundle Flex Prof SP unlimited profiles standard performance (no GPU), no camera - no SmartLight Note: for supported cameras see manual	**6ET2900-0AA01-0BA0**

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Selection and ordering data (continued)

Inspekto Flex Bundle Flex Prof HP unlimited profiles standard performance (no GPU), no camera - no SmartLight Note: for supported cameras see manual	**6ET2900-1AA01-0BA0**
Spare parts	
Four-segment SmartLight (Lumimax)	**6ET2305-0AA00-0BA8**
Mounting accessory Adapter plate for merging Lumimax SmartLight and The Imaging Source camera	**6ET2710-0BA00-0AA0**
Adapter cable Cable for direct connection of SmartLight. 5-pole M12 plug to D-sub. Length 5 m.	**6ET2706-5AA01-0AA1**
Y splitter for cables M12 female to 2x M12 male	**6ET2740-0AA01-0AA0**
Power supply and IO adapter cable For providing power supply and the trigger signal to the SmartLight	**6ET2704-1AA04-0AA0**
Connecting cable (M8, 4 pin, 5 m)	**6ET2706-5AA01-0AA2**
Digital monochrome camera	**6ET2303-0AA00-0BA8**
Cable (RJ45, 5 m)	**6ET2705-5AA04-0AB0**
IPCs with Software - procurable only together with a licence	
IPC with Inspekto SW for Basic	**6BK1000-5VB00-0AA0**
IPC with Inspekto SW for Professional	**6BK1000-5VB00-1AA0**
IPC with Inspekto SW for Basic (High Performance Edition)	**6BK1000-6VB00-0AA0**
IPC with Inspekto SW for Professional (High Performance Edition)	**6BK1000-6VB00-1AA0**
Licenses	
SIEMENS INSPEKTO VIS BASIC V6, (Paper License)	**6ET2500-0AA00-0AA3**
SIEMENS INSPEKTO VIS PROFESSIONAL V6, (Paper License)	**6ET2500-0AA00-0AA2**
SIEMENS UPGRADE BASIC to PROFESSIONAL V6, (OSD-only-CoL)	**6ET2500-5AA00-3AA0**

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Technical specifications

Article number	6ET2901-0AA00-1BA0 Inspekto Core Basic SP	6ET2901-0AA01-1BA0 Inspekto Core Prof SP	6ET2901-1AA00-1BA0 Inspekto Core Basic HP	6ET2901-1AA01-1BA0 Inspekto Core Prof HP
General information				
Product function				
- Visual inspection				
- inspection cycle	300 ms; cycle time may vary; depending on image grabbing method, triggering method and other factors	300 ms; cycle time may vary; depending on image grabbing method, triggering method and other factors	100 ms	100 ms
- object speed, max.	0.75 m/s	0.75 m/s	2.25 m/s	2.25 m/s
- installation clearance, min.	2 cm	2 cm	2 cm	2 cm
- installation clearance, max.	100 cm; recommended max. distance	100 cm; recommended max. distance	100 cm	100 cm
- smallest fault size	0.33 mm at 10 cm distance without optical zoom	0.33 mm at 10 cm distance without optical zoom	0.33 mm at 10 cm distance without optical zoom	0.33 mm at 10 cm distance without optical zoom
- optical magnification	17	17	17	17
- optical settings	autonomous embedded anti-reflection adaptive lighting	autonomous embedded anti-reflection adaptive lighting	autonomous embedded anti-reflection adaptive lighting	autonomous embedded anti-reflection adaptive lighting
- image detection	autonomous	autonomous	autonomous	autonomous
- positioning	autonomous	autonomous	autonomous	autonomous
- trigger type	auto / manual / PLC / trigger-in	auto / manual / PLC / trigger-in	auto / manual / PLC / trigger-in	auto / manual / PLC / trigger-in
- color range of sensor	grayscale	grayscale	grayscale	grayscale
- number of inspection profiles	6	unlimited (limited only by hardware resources)	6	6
- number of possible inspection areas	unlimited (limited only by hardware resources)	unlimited (limited only by hardware resources)		unlimited (limited only by hardware resources)
- Camera				
- vision standard	GigE Vision	GigE Vision	GigE Vision	GigE Vision
- dynamic range	12 bit	12 bit	12 bit	12 bit
- frame rate	36 1/s	36 1/s	36 1/s	36 1/s
- Image resolution	2 048 x 1 536	2 048 x 1 536	2 048 x 1 536	2 048 x 1 536
- focal length, min.	6 800 µm; Wide	6 800 µm; Wide	6 800 µm; Wide	6 800 µm; Wide
- focal length, max.	136 000 µm; tele	136 000 µm; tele	136 000 µm; tele	136 000 µm; tele
- object width, min.	1 cm; Wide	1 cm; Wide	1 cm; Wide	1 cm; Wide
- object width, max.	90 cm; tele	90 cm; tele	90 cm; tele	90 cm; tele
- iris	F1.5 (wide) to F3.4 (tele)	F1.5 (wide) to F3.4 (tele)	F1.5 (wide) to F3.4 (tele)	F1.5 (wide) to F3.4 (tele)
- sensor format	1/1.8"	1/1.8"	1/1.8"	1/1.8"
- pixel format	3 450 nm	3 450 nm	3 450 nm	3 450 nm
- sensor type	Sony IMX26LLR-C	Sony IMX26LLR-C	Sony IMX26LLR-C	Sony IMX26LLR-C
- shutter type	global	global	global	global
- pixel size	3.45 µm	3.45 µm	3.45 µm	3.45 µm
- IR cut filter	Yes (removable)	Yes (removable)	Yes (removable)	Yes (removable)
- shutter	20 ms up to 30 s	20 ms up to 30 s	20 ms up to 30 s	20 ms up to 30 s
- gain	0 dB to 48 dB	0 dB to 48 dB	0 dB to 48 dB	0 dB to 48 dB
- illumination				
- light color	white 5 700 K (CRI80)	white 5 700 K (CRI80)	white 5 700 K (CRI80)	white 5 700 K (CRI80)
- LED technology	SMD LEDs	SMD LEDs	SMD LEDs	SMD LEDs
- width of light-emitting surface	100 mm	100 mm	100 mm	100 mm
- length of light-emitting surface	100 mm	100 mm	100 mm	100 mm
- illuminance	40 000 lx; at 0.1 m	40 000 lx; at 0.1 m	40 000 lx; at 0.1 m	40 000 lx; at 0.1 m

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Technical specifications (continued)

Article number	6ET2901-0AA00-1BA0 Inspekto Core Basic SP	6ET2901-0AA01-1BA0 Inspekto Core Prof SP	6ET2901-1AA00-1BA0 Inspekto Core Basic HP	6ET2901-1AA01-1BA0 Inspekto Core Prof HP
- electrical power at the light field, max.	16.8 W; normal mode	16.8 W; normal mode	16.8 W; normal mode	16.8 W; normal mode
- Operating mode	continuous and switching operation; 4 separately controllable segments	continuous and switching operation; 4 separately controllable segments	continuous and switching operation; 4 separately controllable segments	continuous and switching operation; 4 separately controllable segments
- ON-delay	10.5 µs	10.5 µs	10.5 µs	10.5 µs
- illumination controller	integrated illumination controller	integrated illumination controller	integrated illumination controller	integrated illumination controller
- continuous operation	with no firmware activated, light operates in continuous mode only, red status LED lights up (with firmware activated red status LED turns off)	with no firmware activated, light operates in continuous mode only, red status LED lights up (with firmware activated red status LED turns off)	with no firmware activated, light operates in continuous mode only, red status LED lights up (with firmware activated red status LED turns off)	with no firmware activated, light operates in continuous mode only, red status LED lights up (with firmware activated red status LED turns off)
- PLC switching input	low level ≤ 8 V DC; high level = 12 to 30 V DC; internally limited to 6 mA Switch-on delay 2.5 µs to MCU	low level ≤ 8 V DC; high level = 12 to 30 V DC; internally limited to 6 mA Switch-on delay 2.5 µs to MCU	low level ≤ 8 V DC; high level = 12 to 30 V DC; internally limited to 6 mA Switch-on delay 2.5 µs to MCU	low level ≤ 8 V DC; high level = 12 to 30 V DC; internally limited to 6 mA Switch-on delay 2.5 µs to MCU
- Boost mode	brings 32.4 W to light field for illumination increase, max. switch-on time 500 ms with duty factor 50 %	brings 32.4 W to light field for illumination increase, max. switch-on time 500 ms with duty factor 50 %	brings 33.4 W to light field for illumination increase, max. switch-on time 500 ms with duty factor 50 %	brings 33.4 W to light field for illumination increase, max. switch-on time 500 ms with duty factor 50 %
- risk group	Exempt Group (DIN EN 62471)	Exempt Group (DIN EN 62471)	Exempt Group (DIN EN 62471)	Exempt Group (DIN EN 62471)
Installation type/mounting				
Mounting accessories	including	including	including	including
Supply voltage				
Design of the power supply	DC	DC	DC	DC
permissible range, lower limit (DC)	24 V	24 V	24 V	24 V
permissible range, upper limit (DC)	24 V	24 V	24 V	24 V
Interfaces				
Ethernet interface	Yes	Yes	Yes	Yes
Protocols				
PROFINET	Yes	Yes	Yes	Yes
EtherNet/IP	Yes	Yes	Yes	Yes
Protocols (Ethernet)				
• TCP/IP	Yes	Yes	Yes	Yes
Degree and class of protection				
IP degree of protection	IP20 control cabinet installation / open type	IP20 control cabinet installation / open type	IP20 control cabinet installation / open type	IP20 control cabinet installation / open type
Ambient conditions				
Suited for indoor use	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No
Ambient temperature during operation				
• min.	10 °C	10 °C	10 °C	10 °C
• max.	38 °C	45 °C	38 °C	38 °C
• min. [°F]	50 °F	50 °F	50 °F	50 °F
• max. [°F]	100 °F	113 °F	100 °F	100 °F
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
Relative humidity				
• Operation, min.	20 %	20 %	20 %	20 %
• Operation, max.	80 %	80 %	80 %	80 %
Operating systems				
pre-installed operating system	LINUX	LINUX	LINUX	LINUX
Connection method				
Type of connection	plugged, screwed	plugged, screwed	plugged, screwed	plugged, screwed

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Technical specifications (continued)

Article number	6ET2901-0AA00-1BA0 Inspekto Core Basic SP	6ET2901-0AA01-1BA0 Inspekto Core Prof SP	6ET2901-1AA00-1BA0 Inspekto Core Basic HP	6ET2901-1AA01-1BA0 Inspekto Core Prof HP
Dimensions				
width of controller	262 mm	262 mm	79 mm; 85 mm base module	79 mm; 85 mm base module
height of controller	139.7 mm	139.7 mm	194 mm	194 mm
depth of controller	62.6 mm	62.6 mm	237 mm; 237 mm base module without fan module and with / without extension module 1 slot, 307 mm base module with fan module and with / without extension module 1/2 slots, 400 mm with extension module 4 slots	237 mm; 237 mm base module without fan module and with / without extension module 1 slot, 307 mm base module with fan module and with / without extension module 1/2 slots, 400 mm with extension module 4 slots
camera width	71 mm	71 mm	71 mm	71 mm
camera height	71 mm	71 mm	71 mm	71 mm
camera depth	147 mm	147 mm	147 mm	147 mm
lighting width	130 mm	130 mm	130 mm	130 mm
lighting height	130 mm	130 mm	130 mm	130 mm
lighting depth	20.5 mm	20.5 mm	20.5 mm	20.5 mm
Weights				
weight of controller	2.2 kg	2.2 kg	6 kg	6 kg

Article number	6ET2900-0AA00-0BA0 Inspekto Flex Basic SP	6ET2900-1AA00-0BA0 Inspekto Flex Basic HP	6ET2900-0AA01-0BA0 Inspekto Flex Prof SP	6ET2900-1AA01-0BA0 Inspekto Flex Prof HP
General information				
Product function				
- Visual inspection				
- inspection cycle	300 ms; cycle time may vary; depending on image grabbing method, triggering method and other factors	300 ms; cycle time may vary; depending on image grabbing method, triggering method and other factors	300 ms; cycle time may vary; depending on image grabbing method, triggering method and other factors	300 ms; cycle time may vary; depending on image grabbing method, triggering method and other factors
- object speed, max.	0.75 m/s	0.75 m/s	0.75 m/s	0.75 m/s
- installation clearance, min.	2 cm	2 cm	2 cm	2 cm
- installation clearance, max.	100 cm; recommended max. distance	100 cm; recommended max. distance	100 cm; recommended max. distance	100 cm; recommended max. distance
- smallest fault size	0.33 mm at 10 cm distance without optical zoom	0.33 mm at 10 cm distance without optical zoom	0.33 mm at 10 cm distance without optical zoom	0.33 mm at 10 cm distance without optical zoom
- optical magnification	17	17	17	17
- optical settings	autonomous embedded anti-reflection adaptive lighting	autonomous embedded anti-reflection adaptive lighting	autonomous embedded anti-reflection adaptive lighting	autonomous embedded anti-reflection adaptive lighting
- image detection	autonomous	autonomous	autonomous	autonomous
- positioning	autonomous	autonomous	autonomous	autonomous
- trigger type	auto / manual / PLC / trigger-in	auto / manual / PLC / trigger-in	auto / manual / PLC / trigger-in	auto / manual / PLC / trigger-in
- color range of sensor	grayscale	grayscale	grayscale	grayscale
- number of inspection profiles	6	6	unlimited (limited only by hardware resources)	unlimited (limited only by hardware resources)
- number of possible inspection areas	unlimited (limited only by hardware resources)	unlimited (limited only by hardware resources)	unlimited (limited only by hardware resources)	unlimited (limited only by hardware resources)
Supply voltage				
Design of the power supply	DC	DC	DC	DC
permissible range, lower limit (DC)	24 V	24 V	24 V	24 V
permissible range, upper limit (DC)	24 V	24 V	24 V	24 V
Interfaces				
Ethernet interface	Yes	Yes	Yes	Yes
Protocols				
PROFINET	Yes	Yes	Yes	Yes
EtherNet/IP	Yes	Yes	Yes	Yes
Protocols (Ethernet)				
• TCP/IP	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ET2900-0AA00-0BA0 Inspekto Flex Basic SP	6ET2900-1AA00-0BA0 Inspekto Flex Basic HP	6ET2900-0AA01-0BA0 Inspekto Flex Prof SP	6ET2900-1AA01-0BA0 Inspekto Flex Prof HP
Degree and class of protection				
IP degree of protection	IP20 control cabinet installation / open type	IP20 control cabinet installation / open type	IP20 control cabinet installation / open type	IP20 control cabinet installation / open type
Ambient conditions				
Suited for indoor use	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No
Ambient temperature during operation				
• min.	10 °C	10 °C	10 °C	10 °C
• max.	45 °C	45 °C	45 °C	45 °C
• min. [°F]	50 °F	50 °F	50 °F	50 °F
• max. [°F]	113 °F	113 °F	113 °F	113 °F
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
Relative humidity				
• Operation, min.	20 %	20 %	20 %	20 %
• Operation, max.	80 %	80 %	80 %	80 %
Operating systems				
pre-installed operating system	LINUX	LINUX	LINUX	LINUX
Connection method				
Type of connection	plugged, screwed	plugged, screwed	plugged, screwed	plugged, screwed
Dimensions				
width of controller	262 mm	262 mm	262 mm	262 mm
height of controller	139.7 mm	139.7 mm	139.7 mm	139.7 mm
depth of controller	62.6 mm	62.6 mm	62.6 mm	62.6 mm
lighting width	130 mm	130 mm	130 mm	130 mm
lighting height	130 mm	130 mm	130 mm	130 mm
lighting depth	20.5 mm	20.5 mm	20.5 mm	20.5 mm
Weights				
weight of controller	2.2 kg	2.2 kg	2.2 kg	2.2 kg

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Overview

The Visual Inspection Cockpit is an Industrial Edge application that enables AI-powered visual inspection without requiring AI expertise. It combines flexible AI and robust computer vision algorithms to solve complex visual inspection challenges in production environments. The application allows users to integrate multiple inspection tasks into a single system, using only a small number of NOK training images.

The application can be ordered from this link.

Technical specifications

- Platform: Siemens Industrial Edge
- AI Capabilities: Flexible vision algorithms
- Image Training: Minimal image requirements
- Integration: PLC and IT system compatibility
- Deployment: Managed Edge Infrastructure

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12/2	**Programming devices**
12/2	SIMATIC IPC MD-57A
12/8	**Accessories**
12/8	Communications software
12/8	SOFTNET-IE S7 incl. REDCONNECT
12/10	SOFTNET PROFIBUS

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Overview



SIMATIC IPC MD-57A
SIMATIC IPC MD-57A: Robust, ready-to-use device for configuration and simulation

- TIA Portal preinstalled
- SIMATIC interface integrated
- Rugged design

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Selection and ordering data

SIMATIC IPC MD-57A	6ES7730- ❑ A ❑ ❑ ❑ - ❑ ❑ ❑ 0
15.6" Full HD display (1920x 1080); Wi-Fi 6E Bluetooth V5.3 2x USB-C Gen 4; 3x USB-A Gen 3.2 x 2 1x USB-A Gen 2 2x RJ45 1GbE 1x HDMI 1.4b	
Processor	**0**
• Intel® Core™ i5-12600HE processor (16 threads, 18M cache, up to 4.50 GHz)	**1**
• Intel® Core™ i7-12800HE processor (20 threads, 24 MB cache, up to 4.60 GHz)	
RAM	
• 16 GB DDR5 SDRAM SO-DIMM	**A**
• 32 GB DDR5 SDRAM SO-DIMM	**B**
• 64 GB DDR5 SDRAM SO-DIMM	**C**
Internal M.2 NVME hard drive	
• 512 GB	**0**
• 1 TB	**1**
• 2 TB	**2**
Power plug and keyboard	
• Supply cable with power plug: Europe; Keyboard: QWERTY	**0**
• Supply cable with power plug: Europe; Keyboard: AZERTY (France)	**1**
• Supply cable with power plug: Italy; Keyboard: QWERTY	**2**
• Supply cable with power plug: Switzerland; Keyboard: QWERTY	**3**
• Supply cable with power plug: USA; Keyboard: QWERTY	**4**
• Supply cable with power plug: UK; Keyboard: QWERTY	**5**
• Without supply cable; QWERTY keyboard	**7**
Slider / NVME	
• Without slider	**0**
• 512 GB NVMe SSD slider	**1**
• 1 TB NVMe SSD slider	**2**
• 2 TB NVMe SSD slider	**3**
Operating system	
• Windows 11 IoT Enterprise (version 22H2) 64-bit	**A**
• Windows 11 IoT Enterprise (version 22H2) 64-bit; with recovery USB flash drive	**B**
• Without operating system (without USB flash drive)	**N**
SIMATIC Software licenses	
• Trial: STEP 7 Prof. Combo (V19 & 2021 SR2), WinCC Adv. V19, Safety Adv. (V19 & Distr. Safety 5.4 SP5)	**A**
• STEP 7 & WinCC & Safety in the TIA Portal: STEP 7 Prof. V19, WinCC Adv. V19, Safety Adv. V19	**B**
• STEP 7 & WinCC & Safety Combo: STEP 7 Prof. Combo (V19 & 2021 SR2), WinCC Adv. V19 &, Safety Adv. Combo (V19 & Distr. V5.4 SP5)	**C**
Accessories	
Memory expansion	
SIMATIC IPC memory expansion memory module 16 GB (1x 16 GB) DDR5 SDRAM, SO-DIMM, for IPC BX-56A, IPC BX-59A, IPC MD-57A	**6ES7648-2AN80-0SA0**
SIMATIC IPC memory expansion memory module 32 GB (1x 32 GB) DDR5 SDRAM, SO-DIMM, for IPC BX-56A, IPC BX-59A, IPC MD-57A	**6ES7648-2AN81-0SA0**

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Selection and ordering data (continued)

SIMATIC IPC MD-57A	6ES7730- ❑ A ❑ ❑ ❑ - ❑ ❑ ❑ 0
Slider	
For IPC MD-57A, IPC BX-39A and IPC PX-39A	
SIMATIC IPC Slider M.2 SSD, without SSD	**6ES7648-0EK00-0GA1**
SIMATIC IPC Slider M.2 SSD, 512 GB Eco	**6ES7648-0EK20-0GA3**
SIMATIC IPC Slider M.2 SSD, 1 TB Eco	**6ES7648-0EK30-0GA3**
SIMATIC IPC Slider M.2 SSD, 2TB Eco	**6ES7648-0EK40-0GA3**
External power supply unit	
SIMATIC PG, AC/DC power supply unit IPC MD-57A	**6ES7798-0GA05-0XA1**
Without power supply cord	
Power supply cord	
AC IEC cable, Germany and others	**6ES7900-0AA00-0XA0**
90° male to 180° female (3-pin, C13) for Germany; France; Spain; the Netherlands; Belgium; Sweden; Austria; Finland for devices with corresponding interface; scope of supply: 1 IEC cable	
AC IEC cable, United Kingdom	**6ES7900-0BA00-0XA0**
90° male BS 1363 to 180° female (3-pin, C13) for United Kingdom, for devices with corresponding interface, scope of supply: 1 IEC cable	
AC IEC cable, Switzerland	**6ES7900-0CA00-0XA0**
180° male SEV 1011 to 180° female (3-pin, C13) for Switzerland SEV 1011, for devices with corresponding interface, scope of supply: 1 IEC cable	
AC IEC cable, USA, Canada, and others	**6ES7900-0DA00-0XA0**
180° male to 180° female (3-pin, C13) for USA, Canada, NEMA-5, for devices with corresponding interface, scope of supply: 1 IEC cable	
AC IEC cable, Italy type L and others	**6ES7900-0EA00-0XA0**
180° male to 180° female (3-pin, C13) for Italy, parts of Africa, for devices with corresponding interface, scope of supply: 1 IEC cable	
SIMATIC IPC, replacement battery for IPC MD-57A	**6ES7798-0AA11-0XA0**
Warranty: 6 months	
SIMATIC S7, MPI cable	**6ES7901-0BF00-0AA0**
For connecting SIMATIC S7 and PG / IPC MD-57A via MPI; 5 m	
SIMATIC PG, backpack	**6ES7798-0DA02-0XA0**
For IPC MD-57A, Field PG M6/M5/M4 (included in the scope of supply of the Field PG M6/M5)	
Software Update Service (Standard Edition)[1)]	
The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)	
• STEP 7 Professional V1x	**6ES7822-1AA00-0YL5**
• STEP 7 Professional Combo (STEP 7 Prof. V1x (TIA Portal) and STEP 7 Prof.)	**6ES7810-5CC04-0YE2**
• SIMATIC WinCC Advanced	**6AV6613-0AA00-0AL0**
• SIMATIC STEP 7 Safety Advanced	**6ES7833-1FC00-0YX2**
Software Update Service (Download)[1)]	
The upgrades and Service Packs are available for download. Email address required for delivery	
• STEP 7 Professional V1x	**6ES7822-1AE00-0YY0**
• STEP 7 Professional Combo (STEP 7 Prof. V1x (TIA Portal) and STEP 7 Prof.)	**6ES7810-5CC04-0YY2**
• SIMATIC WinCC Advanced	**6AV6613-0AA00-0AY0**
• SIMATIC STEP 7 Safety Advanced	**6ES7833-1FC00-0YY0**

1) For more information see Software Update Service.

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Technical specifications

Article number	6ES7730-.....-.... SIMATIC IPC MD-57A
General information	
Design of the programming device	Mobile computer
Display	
Design of display	15.6" full HD display in 16:9 format
Screen diagonal	15.6 in
Resolution (pixels)	
• Horizontal image resolution	1 920 pixel
• Vertical image resolution	1 080 pixel
General features	
• Non-reflecting	Yes
• Luminance	300 cd/m²
Backlighting	
• Type of backlighting	LED
Control elements	
Keyboard	
• Design	QWERTZ
Touch operation	
• Integrated touch pad	Yes; Touch pad
Supply voltage	
Design of the power supply	External wide-range power supply, lithium ion battery
Rated value (DC)	19 V
Line frequency	
• permissible range, lower limit	47 Hz
• permissible range, upper limit	63 Hz
Processor	
Processor type	i7-12800HE (2.4 to 4.6 GHz; 14 cores (6 performance cores; 8 efficient cores); 24 MB Smart Cache
Chipset	integrated at CPU
Hyper-threading	Yes
Turbo Boost Technology 2.0	Yes
Graphic	
Graphics controller	Intel® Iris® X Integrated Graphics Controller
Drives	
CD-RW	No
DVD-ROM	No
DVD-RW	No
Hard disk	No
SSD	Yes; M.2
• Memory capacity	1 Tbyte; ...
TPM Security Chip	Yes; 2.0_
Storage	
Type of memory	DDR5 SO-DIMM
Work memory	
• Number of slots	2; _
Accumulator	
Replaceable	Yes; lithium polymer
Capacity	8 A·h

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Technical specifications (continued)

Article number	6ES7730-.....-.... SIMATIC IPC MD-57A
Interfaces	
Number of interfaces PROFIBUS DP	1; 1x PROFIBUS DP / MPI; 9-pin Sub-D socket; 9.6 kBaud to 12 MBaud
Number of RS 232 interfaces	1; 1x COM
Number of USB interfaces	6
• Type A	4; 2x USB-A 3.2 Gen1 and 2x USB-A 3.2 Gen2x1
• type C	2; USB-C 4.0
Number of chip-card readers	1; Smart Card Reader (ISO/IEC 7816)
MPI	Yes
Bluetooth radio standard	Yes; V5.3
Multimedia card/SD card slot	2 in 1 (SDHC UHS-II, MMC)
Card reader for SIMATIC memory cards	SIMATIC memory cards (for S7-300/400), SMC (for S7-1x00), SIMATIC micro memory card (for S7-300/C7/ET 200) - including programming interfaces
Universal Audio Jack	No
Video interfaces	
• analog video signal (VGA)	Yes; via adapter from HDMI to VGA
• DVI-I	Yes; via adapter from HDMI to DVI
• DisplayPort	Yes; via adapter from HDMI to DisplayPort
Industrial Ethernet	
• Industrial Ethernet interface	2x Ethernet (RJ45)
- 100 Mbps	Yes
- 1000 Mbps	Yes; Gigabit Ethernet; 2x RJ45 with 2 independent MAC/IP addresses
• Wake on LAN	Yes
• IAMT (Intel Active Management Technology)	Yes
WLAN	
• Type	IEEE802.a/b/g/n/ac R2/ax R2(PreStandard)
Interrupts/diagnostics/status information	
LED status display	4 status LEDs
EMC	
Interference immunity against discharge of static electricity	
• Interference immunity against discharge of static electricity acc. to IEC 61000-4-2	Yes; ±4 kV contact discharge acc. to IEC 61000-4-2, ESD; ±8 kV air discharge acc. to IEC 61000-4-2, ESD
Interference immunity to cable-borne interference	
• Interference immunity on supply cables	±2 kV (according to IEC 61000-4-4, burst); ±1 kV (according to IEC 61000-4-5, surge pulse/line to line); ±2 kV (according to IEC 61000-4-5, surge pulse/line to ground)
• Interference immunity on signal cables	±1 kV (according to IEC 61000-4-4, burst, length < 30 m); ±2 kV (according to IEC 61000-4-4, burst, length > 30 m); ±2 kV (according to IEC 61000-4-5, surge sym./line to ground, length > 30 m)
Degree and class of protection	
IP degree of protection	IP30
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
DIN/ISO 9001	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	5 °C; Max. 10 °C/h (no condensation)
• max.	40 °C; Max. 10 °C/h (no condensation)
Operating systems	
Local language of operating system	Multi-Language User Interface (MUI): 6 languages (English, German, French, Spanish, Italian, Chinese)
pre-installed operating system	
• Windows 11	Yes; Windows 11 IoT Enterprise (version 22H2)

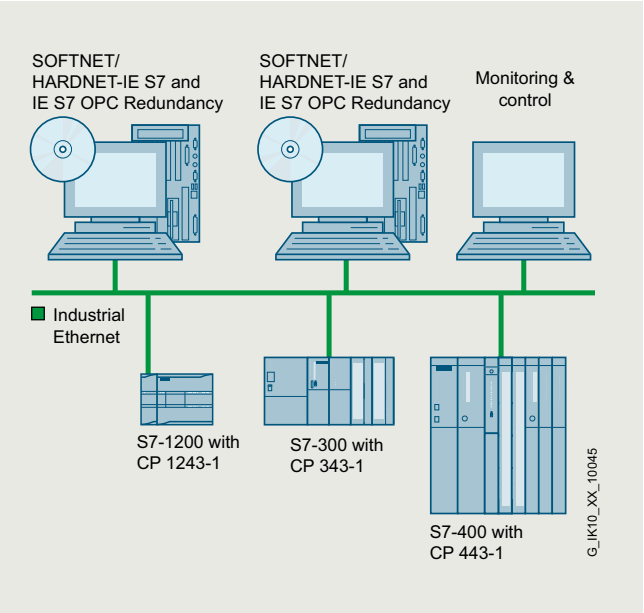
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Technical specifications (continued)

Article number	6ES7730-.....-.... SIMATIC IPC MD-57A
Software	
Preinstalled	
• STEP 7 Professional (TIA Portal)	Yes; software version: V19
• STEP 7	Yes; Professional 2021 SR2
• WinCC flexible Advanced 2008	No
• WinCC Advanced (TIA Portal)	Yes; software version: V19
• STEP 5	No
Mechanics/material	
Material of housing	metal
Handle	Yes; retractable
Socket for Kensington lock	Yes
rubber corner guards	Yes
Dimensions	
Width	386 mm
Height	41 mm
Depth	281 mm
Weights	
Weight, approx.	2.8 kg; incl. rechargeable battery
Scope of supply	
Accumulator	Yes
Power supply unit	Yes
Backpack	Yes
SIMATIC Software	Yes
Recovery media	Yes; Restore & Recovery

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Overview



System configuration SOFTNET for Industrial Ethernet

ISO	TCP/ UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
●	●			●	●	●	

G_IK10_XX_10185

- Software for coupling PGs/PCs/workstations to automation systems
- Communications services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
- Can be used with
  - Layer 2 Ethernet card (PCI/PCIe)
  - Integrated Industrial Ethernet interface
- Complete protocol stack as a software package

Selection and ordering data

	Article No.
SOFTNET-S7 for Industrial Ethernet Software for S7 and open communication, incl. OPC server, PG/OP communication, and NCM PC/STEP 7 Professional, runtime software, software, electronic manual and license key on USB flash drive or by download, Class A	
SOFTNET-IE S7 V21 For 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; up to 64 connections; floating license for one installation	
• On USB flash drive	**6GK1704-1CW25-0AA0**
• Download [1]	**6GK1704-1CW25-0AK0**
SOFTNET-IE S7 Software Update Service For one year with automatic extension Requirement: current software version	
• On USB flash drive	**6GK1704-1CW00-3AL0**
• Download [1]	**6GK1704-1CW00-3AP0**
SOFTNET-IE S7 Upgrade As of Edition 2006 to current version	
• On USB flash drive	**6GK1704-1CW00-3AE0**
• Download [1]	**6GK1704-1CW00-3AK0**
SOFTNET-IE S7 Plus V21 Software for S7-, S5-compatible comm., OPC; PG/OP comm., up to 128 connections For 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; Up to 128 connections; Floating license for one installation	
• Download [1]	**6GK1704-1PW25-0AK0**
SOFTNET-IE S7 Plus PowerPack V21 Extends SOFTNET-IE S7 V21 to SOFTNET-IE S7 Plus V21 for 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; floating license for one installation	
• Download [1]	**6GK1704-1PW25-0AK1**
SOFTNET-IE S7 EXTENDED V21 Software for S7-, S5-compatible Comm. OPC; PG/OP comm., up to 255 connections (S7) or 512 connections (S7-1200/S7-1500) For 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; up to 512 connections; floating license for one installation	
• On USB flash drive	**6GK1704-1BW25-0AA0**
• Download [1]	**6GK1704-1BW25-0AK0**

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Selection and ordering data (continued)

	Article No.
SOFTNET-IE S7 EXTENDED Upgrade	
As of Edition 2006 to current version	
• On USB flash drive	**6GK1704-1BW00-3AE0**
• Download [1]	**6GK1704-1BW00-3AK0**
SOFTNET-IE S7 PowerPack V21	
Extends SOFTNET-IE S7 Lean V21 to SOFTNET-IE S7 V21 for 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; up to 64 connections; floating license for one installation	
• On USB flash drive	**6GK1704-1CW25-0AC0**
• Download [1]	**6GK1704-1CW25-0AK1**
SOFTNET-IE S7 REDCONNECT V21	
Software for fail-safe S7 communication via redundant networks, incl. S7 OPC server, runtime software, software, electronic manual and license key on USB flash drive or by download, Class A	
For 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; floating license for one installation	
• On USB flash drive	**6GK1704-0HB25-0AA0**
• Download [1]	**6GK1704-0HB25-0AK0**
SOFTNET-IE S7 REDCONNECT Upgrade	
As of Edition 2006 to current version	
• On USB flash drive	**6GK1704-0HB00-3AE0**
• Download [1]	**6GK1704-0HB00-3AK0**
SOFTNET-IE S7 Lean Edition V21	
For 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 Up to eight connections; English/German/Chinese; floating license for one installation	
• On USB flash drive	**6GK1704-1LW25-0AA0**
• Download [1]	**6GK1704-1LW25-0AK0**
SOFTNET-IE S7 Lean Software Update Service	
For one year with automatic extension Requirement: current software version	
• On USB flash drive	**6GK1704-1LW00-3AL0**
• Download [1]	**6GK1704-1LW00-3AP0**
SOFTNET-IE S7 Lean Upgrade	
As of Edition 2006 to current version	
• On USB flash drive	**6GK1704-1LW00-3AE0**
• Download [1]	**6GK1704-1LW00-3AK0**

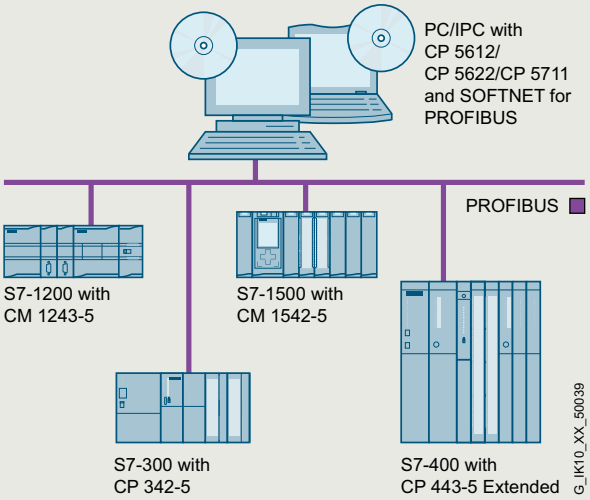
[1] For more details on Online Software Delivery, visit:
http://www.siemens.com/tia-online-software-delivery
under Ordering data.

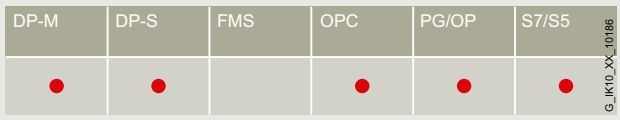
Technical specifications

Performance data	
S7 and PG/OP communication (number of operable connections)	
• SOFTNET-IE S7 Extended	Max. 255 (S7-300 / S7-400) Max. 512 (S7-1200 / S7-1500)
• SOFTNET-IE S7	Max. 64
• SOFTNET-IE S7 Plus	Max. 128
• SOFTNET-IE S7 Lean	Max. 8

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Overview





- Software for connecting PCs/PGs and notebooks to automation systems
- Communications services:
  - PROFIBUS DP master Class 1 and 2 with acyclic expansions
  - PROFIBUS DP slave
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE) based on the FDL interface
- The appropriate OPC servers and configuration tools are included in the scope of supply of the respective communications software

Selection and ordering data

	Article No.
SOFTNET-PB S7 Software for S7 communication, including FDL protocol with OPC server and configuration tool, runtime software, software, electronic manual and license key on USB flash drive or by download, Class A; for CP 5612, CP 5622, CP 5711	
SOFTNET-PB S7 V21 For 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; floating license for one installation	
• On USB flash drive	**6GK1704-5CW25-0AA0**
• Download [1]	**6GK1704-5CW25-0AK0**
SOFTNET-PB S7 Software Update Service For one year with automatic extension Requirement: current software version	
• On USB flash drive	**6GK1704-5CW00-3AL0**
• Download [1]	**6GK1704-5CW00-3AP0**
SOFTNET-PB S7 Upgrade As of Edition 2006 to current version	
• On USB flash drive	**6GK1704-5CW00-3AE0**
• Download [1]	**6GK1704-5CW00-3AK0**
SOFTNET-PB DP Software for DP protocol (Master Class 1 and 2), including FDL protocol with OPC server and configuration tool; runtime software, software, electronic manual and license key on USB flash drive or by download; for CP 5612, CP 5622, CP 5711	
SOFTNET-PB DP V21 For 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; floating license for one installation	
• On USB flash drive	**6GK1704-5DW25-0AA0**
• Download [1]	**6GK1704-5DW25-0AK0**
SOFTNET-PB DP Software Update Service For one year with automatic extension Requirement: current software version	
• On USB flash drive	**6GK1704-5DW00-3AL0**
• Download [1]	**6GK1704-5DW00-3AP0**
SOFTNET-PB DP Upgrade As of Edition 2006 to current version	
• On USB flash drive	**6GK1704-5DW00-3AE0**
• Download [1]	**6GK1704-5DW00-3AK0**
SOFTNET-PB DP Slave Software for DP slave, with OPC server and configuration tool, floating license, runtime software, software, electronic manual and license key on USB flash drive or by download, Class A; for CP 5612, CP 5622, CP 5711	

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Selection and ordering data (continued)

	Article No.
SOFTNET-PB DP Slave V21	
For 64-bit: • Windows 11 Professional/Enterprise • Windows 10 (IoT) Enterprise 2019 LTSC • Windows 10 (IoT) Enterprise 2021 LTSC • Windows 11 (IoT) Enterprise 2024 LTSC • Windows Server 2022 • Windows Server 2025 English/German/Chinese; floating license for one installation	
• On USB flash drive	**6GK1704-5SW25-0AA0**
• Download [1]	**6GK1704-5SW25-0AK0**
SOFTNET-PB DP Slave Software Update Service	
For one year with automatic extension Requirement: current software version	
• On USB flash drive	**6GK1704-5SW00-3AL0**
SOFTNET-PB DP Slave Upgrade	
As of Edition 2006 to current version	
• On USB flash drive	**6GK1704-5SW00-3AE0**
• Download [1]	**6GK1704-5SW00-3AK0**

Technical specifications

Performance data	CP 5612/CP 5622/CP 5711
Mono-protocol operation	
Number of connectable DP slaves	Max. 60
Number of FDL tasks simultaneously waiting	Max. 50
Number of PG/OP and S7 connections	Max. 8
• DP master	DP-V0, DP-V1 with SOFTNET-PB DP
• DP slave	DP-V0, DP-V1 with SOFTNET-PB DP slave

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13/2	**Telecontrol systems for comprehensive applications**
13/2	Telecontrol systems for comprehensive applications
13/3	SIPLUS RIC for IEC protocol
13/4	SIPLUS RIC libraries for S7-1500 (R/H), ET 200SP and Software Controllers
13/5	SIPLUS RIC libraries for ET 200S
13/6	SIPLUS RIC libraries for S7-300
13/7	SIPLUS RIC libraries for S7-400/S7-400H
13/8	SIPLUS RIC libraries for WinAC
13/9	**Automatic door controls**
13/9	SIDOOR automatic door controls
13/10	for elevators
13/12	Control devices
13/12	SIDOOR AT40 elevator door drive
13/15	SIDOOR ATE500E elevator door drive
13/18	Power supplies
13/18	Power supply unit
13/20	Switched-mode power supply
13/23	Additional units
13/23	Software kit
13/24	SIDOOR LINK and SIDOOR SUPPORT App
13/25	Geared motors
13/27	Direct drives
13/29	Accessories
13/33	for industrial applications
13/34	Control devices
13/34	SIDOOR ATD401W
13/37	SIDOOR ATD420W
13/40	SIDOOR ATD430W
13/43	Power supplies
13/44	Power supply unit
13/46	Switched-mode power supply
13/49	3-phase, 36 V DC
13/52	Additional units
13/52	Software kit
13/53	SIDOOR LINK and SIDOOR SUPPORT App
13/54	Geared motors
13/58	Accessories
13/61	for railway applications
13/62	Control devices
13/62	Platform screen door drive
13/65	Control device for gap fillers
13/68	Interior railway door drives
13/71	Additional units
13/71	Software kit
13/72	Geared motors
13/74	Direct drives
13/76	Accessories

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Overview

Telecontrol systems for controlling and monitoring widely distributed plants usually consist of a supervisory control system (telecontrol center) and one or more outstations connected over large distances for the automation of distributed plant sections.

SIPLUS RIC is a versatile telecontrol system that uses the internationally standardized telecontrol protocols:

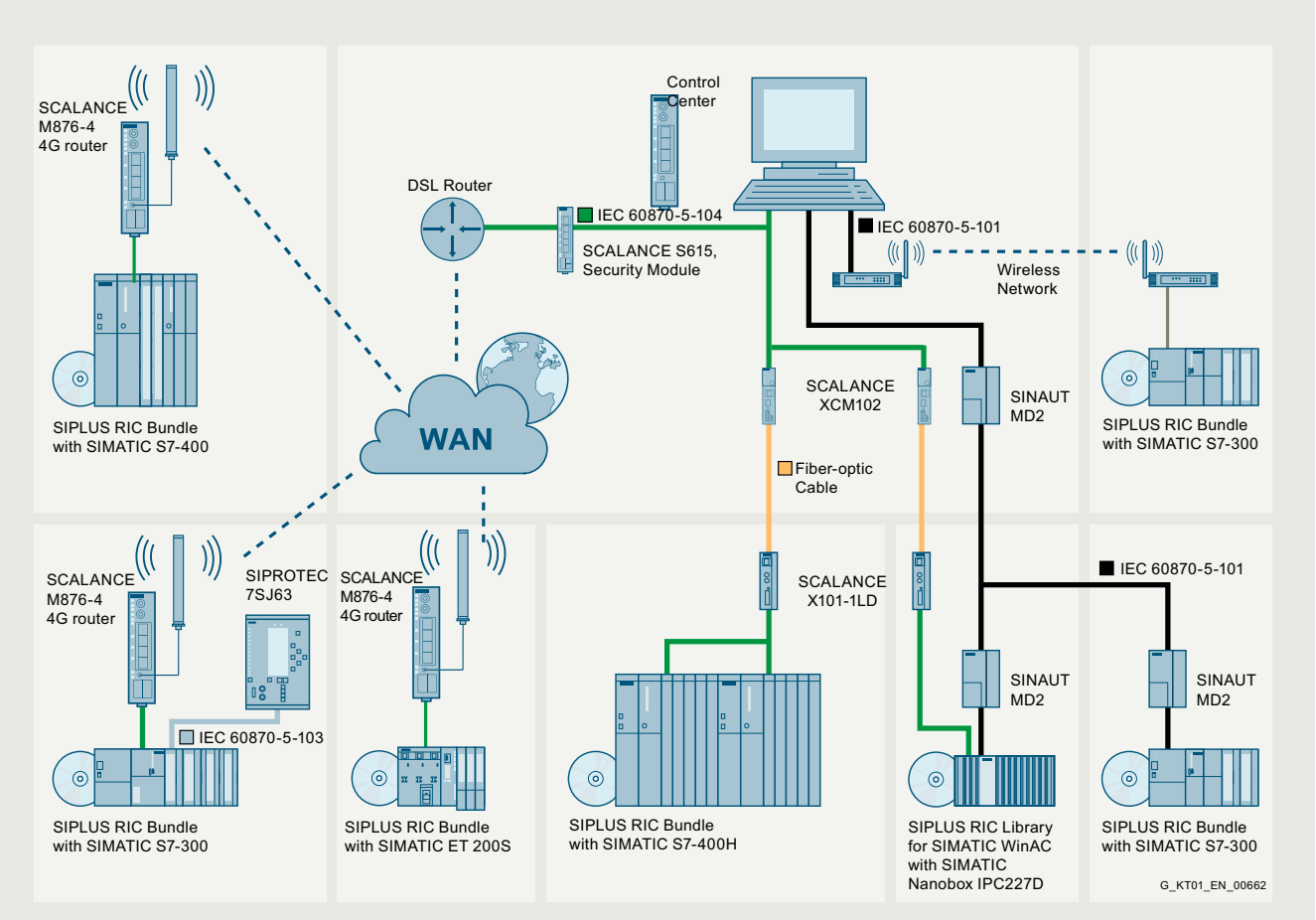
- Serial transmission IEC 60870-5-101
- Ethernet (TCP/IP) IEC 60870-5-104
- Connection of protection devices IEC 60870-5-103

It provides secure communication with reduced data volume for reliable operation in the Wide Area Network (WAN) thanks to event-driven, time-stamped transmission and monitored output of commands.

Application

SIPLUS RIC offers maximum functionality and modularity to meet the requirements made upon the monitoring and control of spatially distributed systems, even under extreme environmental conditions.

It is therefore suitable for sectors such as Oil, Gas, Water, Wastewater, Power Generation/Distribution, and Transportation.



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Overview

IEC 60870-5-101, -103, -104 are standardized, vendor-independent protocols. With SIPLUS RIC, they can be parameterized with the SIMATIC Manager or TIA Portal without the need for additional installations.

The IEC 60870-5-101 protocol supports classical WAN connections via dedicated lines,

The coupling is made

- directly
- via media converters (e.g. modems) or
- via the serial interfaces (RS232 or RS485) of the communications modules, e.g. 1SI, CP 341, CP 441 or CM PtP/PTP

The IEC 60870-5-103 protocol permits serial communication with protection devices, e.g. SIPROTEC. The link is made similar to IEC 60870-5-101 via serial communications modules.

The IEC 60870-5-104 protocol supports TCP/IP-based WAN connections such as internet/DSL or GPRS/UMTS/LTE. Either the PN interfaces of the CPUs or the Industrial Ethernet communications modules, e.g. CP 343, CP 443 and CM/CP 154x, are used as interfaces. Redundancy groups and substitute routes (combinations of serial and Ethernet transmission paths) are both possible and enabled via the interfaces.

Security requirements for IEC 104 communication can be achieved with:

- external components (firewall/VPN gateways such as SCALANCE S)
- integrated security features (e.g. firewall/VPN of Advanced CPs)

TLS can be used within the mechanisms (and limitations) provided by SIMATIC for the encryption of IEC 60870-5-104 communication.

The libraries for the IEC 60870-5-101 and -104 protocols are supplied as master (SCADA/Control Center/Controlling Station (control system)) and slave (substation/RTU/Controlled Station) including activation for PN-CPU and CP interface. The IEC 60870-5-103 library is only available as master.

SIMATIC Controllers can also communicate with third-party products by means of the IEC protocols and exchange data from the SIMATIC Controller.

By combining the different library variants (within a CPU), information from lower-level stations and also protection devices can be forwarded to the control stations (node or gateway functionality). Reversed direction signal paths are also supported.

The modular concept in connection with presets enables a fast configuration of stations with basic functionality. Specific requirements (e.g. individual addresses, transfer of external time stamps) can also be parameterized and programmed individually. Example projects are available to make starting easier. They can be used as a basis for one's own projects or initial tests.

Libraries including the example projects and documentation can be downloaded from Siemens Online Support as trial versions and used without a valid license (activation code) in demo mode (15 minutes of full functionality after each CPU restart).

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Overview



If a system based on SIMATIC S7-1500, S7-1500R/H, ET 200SP or Software Controller is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-1500/ET 200SP functionalities for the following data volumes:

- 200 data points, for use with CPU 1510SP-1 PN[1)], CPU 1511-1 PN and CPU 1511C-1 PN
- 800 data points, for use with CPU 1512SP-1 PN and CPU 1512C-1 PN
- 1000 data points, for use with CPU 1513-1 PN
- 2000 data points, for use with CPU 1515-2 PN
- 4000 data points, for use with CPU 1516-3 PN/DP
- 5000 data points, for use with CPU 1517-3 PN/DP and with CPU 1518-4 PN/DP

The work memory for data is used for buffering the message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices, thus saving hardware costs and programming overhead.

The libraries and licenses are delivered digitally or as a download (OSD, Online Software Delivery). Three variants are available for selection:

- 50 data points ("tags")
- 500 data points
- Unlimited number of data points

Only information objects in monitoring direction (e.g. messages, measured values) are counted.

A license certificate is supplied with the order, which can be used to request activation codes for permanent use of the purchased protocols on the employed hardware (linked to serial number). For more information on this, see this link.

The license certificate required for the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is available for download in SiePortal after purchase.

1) CPU 1510SP-1 PN is only suitable for small installations due to the small amount of work memory. If the CPU is used for other tasks besides the IEC protocol, it is absolutely necessary to check the work memory load beforehand.

Selection and ordering data

SIPLUS RIC libraries for SIMATIC S7-1500/S7-1500 RH/ET 200SP/Software Controllers	
Runtime license, software download, incl. license key[1)] Consignee email address required for delivery	
Max. 50 tags (information objects in the monitoring direction)	**6AG6003-7CF01-0LE0**
Max. 500 tags (information objects in the monitoring direction)	**6AG6003-7CF01-0LF0**
Unlimited number of tags (information objects in the monitoring direction)	**6AG6003-7CF01-0LP0**

1) Up-to-date information and download availability can be found under this link.

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Overview



If a SIMATIC ET 200S-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC ET 200S functionalities, for data volumes up to 200 information points.

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries and licenses are delivered digitally or as a download (OSD, Online Software Delivery).
A license certificate is supplied with the order, which can be used to request activation codes for permanent use of the purchased protocols on the employed hardware (linked to serial number). For more information on this, see this link.

The license certificate required for the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is available for download in SiePortal after purchase.

Selection and ordering data

SIPLUS RIC libraries for SIMATIC ET 200S Runtime license, software download, incl. license key[1] Consignee email address required for delivery	**6AG6003-5CF01-0DA0**

[1] Up-to-date information and download availability can be found under this link.

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Overview



If a SIMATIC S7-300-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-300 functionalities, for the following data volumes:

- 200 information points, for use with CPU 314
- 1000 information points, for use with CPU 315
- 2000 information points, for use with CPU 317
- 5000 information points, for use with CPU 319

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries and licenses are delivered digitally or as a download (OSD, Online Software Delivery).
A license certificate is supplied with the order, which can be used to request activation codes for permanent use of the purchased protocols on the employed hardware (linked to serial number). For more information on this, see this link.

The license certificate required for the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is available for download in SiePortal after purchase.

Selection and ordering data

SIPLUS RIC libraries for SIMATIC S7-300 Runtime license, software download, incl. license key[1)] Consignee email address required for delivery	**6AG6003-1CF01-0DA0**

[1)] Up-to-date information and download availability can be found under this link.

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Overview



If a SIMATIC S7-400/S7-400H-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-400/S7-400H functionalities for the following data volumes:

- 1000 information points, for use with CPU 412 or CPU 412H
- 2000 information points, for use with CPU 414 or CPU 414H
- 5000 information points, for use with CPU 410H, CPU 416/CPU 416H or CPU 417/CPU 417H

The data memory, which is limited to 256 MB in the CPU 410H for data blocks generated online, is used for buffering the frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries and licenses are delivered digitally or as a download (OSD, Online Software Delivery).
A license certificate is supplied with the order, which can be used to request activation codes for permanent use of the purchased protocols on the employed hardware (linked to serial number). For more information on this, see this link.

The license certificate required for the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is available for download in SiePortal after purchase.

Selection and ordering data

SIPLUS RIC libraries for SIMATIC S7-400 Runtime license for SIMATIC S7-400 from firmware version 4.x; software download, incl. license key[1] Consignee email address required for delivery Note: If used in S7-400H systems, a license will be required for both CPUs.	**6AG6003-3CF01-0AA0**

[1] Up-to-date information and download availability can be found under this link.

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Overview



If a system based on SIMATIC WinAC RTX is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier, using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

The SIPLUS RIC software libraries are based on the standard SIMATIC Manager (WinAC) or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries and licenses are delivered digitally or as a download (OSD, Online Software Delivery).
A license certificate is supplied with the order, which can be used to request activation codes for permanent use of the purchased protocols on the employed hardware (linked to serial number). For more information on this, see this link.

The license certificate required for the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is available for download in SiePortal after purchase.

Selection and ordering data

SIPLUS RIC libraries for WinAC Runtime license, software download, incl. license key[1] Consignee email address required for delivery	**6AG6003-0CF01-0AA0**

[1] Up-to-date information and download availability can be found under this link.

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Design



SIDOOR automatic door control systems

The SIDOOR product family is primarily intended for the operation of sliding doors, whereby these doors can be operated both horizontally and vertically.

Door control systems are characterized by the fact that there are always two defined states for the open and closed position of the door.

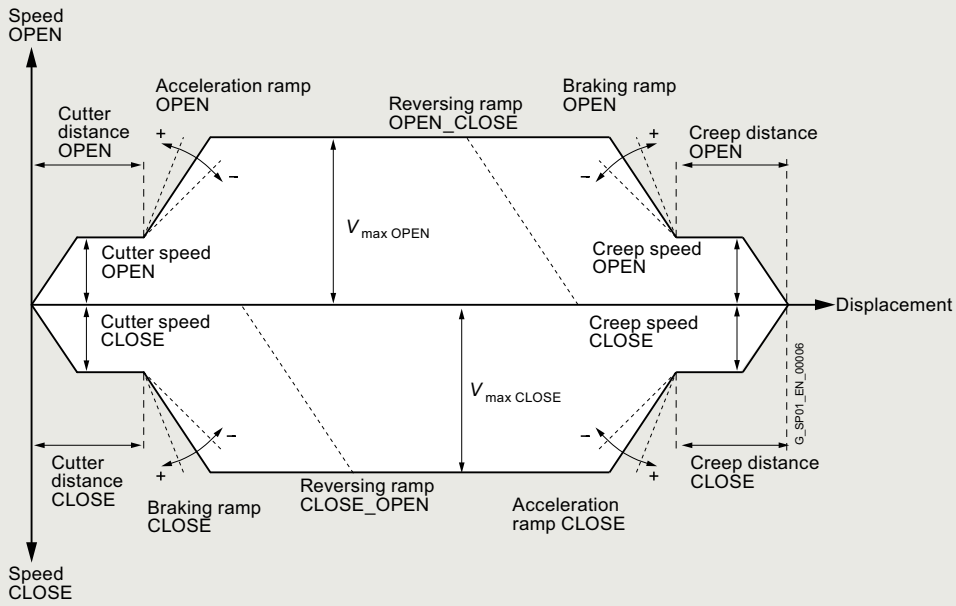
The door is always controlled, regulated and moved between these two positions in accordance with the guidelines of the respective application.

In a defined learn run via "single-button operation", the door system independently determines the values for the door width, the dynamic door weight and the drive direction of the geared motor and stores these data in a non-volatile memory.

The optimum drive characteristics at the door are automatically calculated and are consistently adhered to.

The travel curve transitions are rounded off so that the door movement is smooth and jerk-free.

Door control system is the general term for a controller of an access system.



Creep speed	Reduced speed in the vicinity of the OPEN position of the elevator door (creep distance)
Cutter speed	Reduced speed in the vicinity of the CLOSED position of the elevator door (cutter distance)
Creep distance	Range of door travel in the vicinity of the OPEN position
Cutter distance	Range of door travel in the vicinity of the CLOSED position
V_{max}	Maximum permissible door speed

Reversing ramp OPEN_CLOSE	Travel reverses from the OPEN to the CLOSE direction
Reversing ramp CLOSE_OPEN	Travel reverses from the CLOSE to the OPEN direction

Note:
When reversing from the open to the close direction, the door is braked with the reversing ramp OPEN_CLOSE, and starts the closing movement with the acceleration ramp CLOSE.

Travel curve

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Application

The elevator door drive is comprised of a controller and the maintenance-free drive unit, geared motor or gearless EC technology direct drive motor.

Control devices are electronic controllers connected to the power supply via an external power supply unit (SIDOOR NT40 or SIDOOR Transformer). They are generally connected to the higher-level controller via digital or fieldbus interfaces, and can be configured via a user interface.

The SIDOOR AT40 and SIDOOR ATE500E control devices can be used to operate horizontally operated cabin and shaft doors as well as vertical doors for lifting or rolling doors at adjustable speeds and accelerations.

Geared motors form the maintenance-free drive unit in the door drive. The geared motors feature DC motors with non-self-locking gearing, and are speed-controlled. The set force and speed limits are not exceeded. The gearless motor (direct drive) is the maintenance-free drive unit of the door drive.

Operation of the named door drives does not require limit switches. The door width and the "OPEN"/"CLOSE" positions are determined automatically.

The power is transmitted by a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with 2 door clutch holders. This enables it to drive both one-sided and centrally-opening doors. The accessories are not included in the scope of supply, see "Accessories".

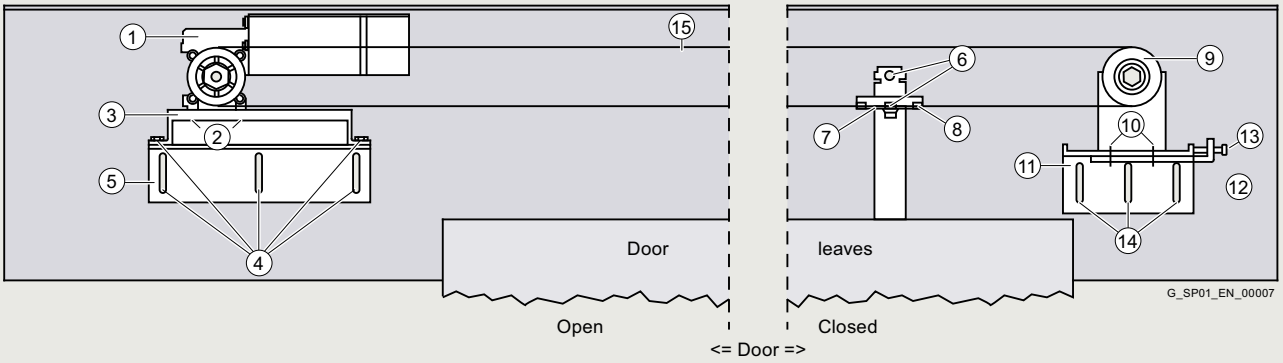
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Design

The product-specific property of the elevator door controllers is based on the fact that the closing weights/closing springs integrated in the shaft doors are also taken into account.

These weights/springs are integrated in the shaft doors so that open doors close automatically if the cabin is not at the relevant floor.

They must also be moved by the elevator door drive in their opening direction and support it in the closing movement.



Complete motor mounting

(1) Geared motor
(2) 4 x locking hexagonal safety bolts M5 x 10
(3) Rubber-metal anti-vibration mount
(4) 10 x locking hexagonal safety bolts M6 x 16
(5) Mounting bracket for the motor mounting

Mounting material for door clutch holder

(6) 2 x locking hexagonal safety bolts M6 x 12
(7) Door clutch holder
(8) Clamping plate

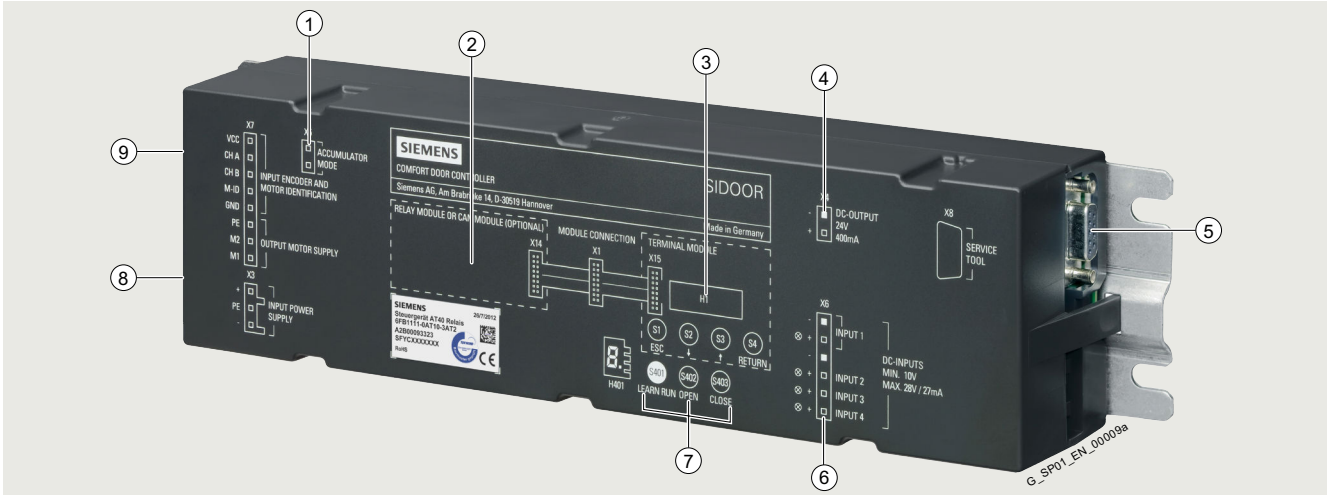
Deflector unit and clamping device

(9) Deflector unit
(10) 2 x locking hexagonal safety bolts M6 x 12
(11) Mounting bracket for the deflector unit and tensioning device
(12) Tensioning lug for the deflector unit and tensioning device
(13) Tensioning screw M6 x 30
(14) 10 x locking hexagonal safety bolts M6 x 16
(15) Toothed belt (length 4 m)

Mounting suggestion for door control systems

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Overview



1. Optional: additional input signal
2. CAN or relay module version
3. Terminal module
4. Connection for 24 V DC/400 mA output voltage
5. Connection
   - Software Kit
6. Input signal connection
7. Control panel
8. Connector
   - NT40 switched-mode power supply or
   - Mains transformer
9. Motor connection

SIDOOR AT40 elevator door drive (relay module version)

SIDOOR AT40 – SIDOOR enables the quick, easy and versatile installation, configuration and operation of a wide range of elevator door systems.

- Version:
- RELAY (including relay and terminal module)
- CAN (including CAN and terminal module),
  two controllers are available: SIDOOR AT40 CAN and CAN ADV.
  - Certified by CiA (CiA 301 / CiA 417).
  - The door system can be visualized and parameterized by the elevator controller using the "Virtual Terminal" function.
  - With the SIDOOR AT40 CAN ADV controller, parameters for evaluating mechanical wear can be provided at the door. These parameters can be accessed from the CAN-BUS via the elevator controller or other bus nodes and can be evaluated floor-dependently by an external evaluation logic. It includes, e.g. event counters, maximum current values in the slow end distance of the door, traversing times and energy values of the opening and closing cycles, as well as other performance values.
  - The evaluation can affect the maintenance cycles of the elevator system.
- For dynamic door weights up to 600 kg, depending on motor variant
- Automatic door weight detection
- 4 to 8 kg maximum counterweight (depending on motor version)
- Operating temperature -20 to +50 °C
- Flexible motor management (four different motor types), automatic detection
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC ± 15 %; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Supports power-optimized operation in the elevator cabin
- Vandal-proof
- IP54 degree of protection for 180 to 600 kg motor versions, gear unit IP40 (SIDOOR M5: entirely IP54)
- The current operating states are indicated via a 7-segment display or a terminal module directly in the elevator door drive or externally. The SIDOOR SOFTWARE KIT or the SIDOOR LINK with the SIDOOR SUPPORT App are used for this, see Additional units.

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Selection and ordering data

SIDOOR AT40 elevator door drive	
- horizontal, up to 600 kg door weight	
Control device with RELAY (including relay and terminal module)	**6FB1111-0AT10-3AT2**
Control device with CAN (including CAN and terminal module),	**6FB1111-1AT10-3AT3**
Control device with CAN module and maintenance data via CANopen	**6FB1111-1AT11-3AT3**

Technical specifications

Article number	6FB1111-0AT10-3AT2 SIDOOR AT40 RELAY	6FB1111-1AT10-3AT3 SIDOOR AT40 CAN	6FB1111-1AT11-3AT3 SIDOOR AT40 CAN ADV
General information			
Product type designation	AT40 RELAY		AT40 CAN ADV
Supply voltage			
Design of the power supply	via SIDOOR TRANSFORMER / NT40		
Input current			
Current consumption, max.	10 A		
I^2t, min.	30 $A^2 \cdot s$		
Encoder supply			
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!		
short-circuit proof	Yes		
24 V encoder supply			
• Output current, max.	400 mA		
Power			
Active power input	80 W		
Active power input, max.	540 W		
Active power input (standby mode)	5 W	6 W	
Digital inputs			
Control inputs isolated	Yes		
Control inputs p-switching	Yes		
Input voltage			
• for signal "0", min.	-3 V		
• for signal "0", max.	5 V		
• for signal "1", min.	10 V		
• for signal "1", max.	28 V		
Input current			
• for signal "0", max. (permissible quiescent current)	0.5 mA		
• for signal "1", min.	9 mA		
• for signal "1", max.	27 mA		
Digital outputs			
Relay outputs			
- Switching capacity of contacts			
- at 30 V DC, min.	0.01 A		
- at 30 V DC, max.	1 A	0.5 A	
- at 50 V DC, min.	0.01 A; Switching voltage 50 V DC		
- at 50 V DC, max.	1 A; Switching voltage 50 V DC		
- at 230 V AC, min.	0.01 A		
- at 230 V AC, max.	1 A		

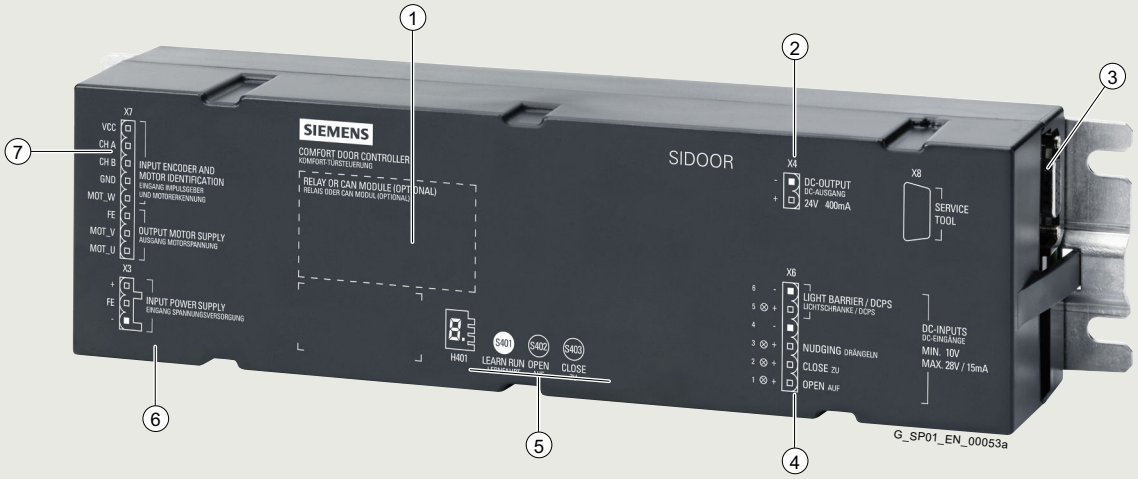
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Technical specifications (continued)

Article number	6FB1111-0AT10-3AT2 SIDOOR AT40 RELAY	6FB1111-1AT10-3AT3 SIDOOR AT40 CAN	6FB1111-1AT11-3AT3 SIDOOR AT40 CAN ADV
Mechanical data			
Opening width of door, min.	0.3 m		
Opening width of door, max.	5 m		
Weight of door, max.	600 kg		
Operating cycle frequency of door, max.	180 1/h		
Counterforce, max.	80 N		
Kinetic energy, max.	100 J		
Counterweight			
• with SIDOOR M2 geared motor, max.	4 kg		
• with SIDOOR M3 geared motor, max.	6 kg		
• with SIDOOR M4 geared motor, max.	8 kg		
• with SIDOOR M5 geared motor, max.	8 kg		
Interfaces			
Interfaces/bus type	without	CANopen, CiA standard 301, profile 417	
Number of bus nodes		32	
Standards, approvals, certificates			
Certificate of suitability according to EN 81	Yes		
CE mark	Yes		
UL approval	No		
EAC (formerly Gost-R)	Yes		
TÜV Inspectorate approval	Yes		
TÜV prototype tested	Yes		
China RoHS compliance	Yes		
Standard for safety	EN 61010-1 / EN 61010-2-201 / EN 81-20		
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C		
• max.	50 °C		
Ambient temperature during storage/transportation			
• Storage, min.	-40 °C		
• Storage, max.	50 °C		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m		
Relative humidity			
• No condensation, min.	10 %		
• No condensation, max.	93 %		
Dimensions			
Width	320 mm		
Height	60 mm		
Depth	80 mm		

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Overview



1. CAN module or RELAY module
2. Connection for 24 V DC/400 mA output voltage
3. Connection
   - Software Kit
4. Input signal connection
5. Control panel
6. Connection
   - NT40 switched-mode power supply
   - Transformer
7. Motor connection (direct drive)

SIDOOR ATE500E elevator door drive

The SIDOOR ATE500E elevator door drive enables the quick, easy and versatile installation, configuration and operation of EC technology gearless elevator door systems.

- Design:
  - Relay module
  - CAN module
- For dynamic door weights up to 280 kg
- High control performance and optimized drive characteristic transitions
- Automatic door weight detection (single-button commissioning)
- 6 kg maximum counterweight of the coupled floor door
- Operating temperature -25 to +50 °C without restrictions
- Automatic identification of the connected motor
- Opening width 0.3 to 5 m
- Auxiliary voltage output 24 V DC ± 15%; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Optimized energy consumption during cabin operation (DCPS)
- Vandal-proof
- IP20 degree of protection
- The current operating states are indicated via a 7-segment display directly in the elevator door drive or externally using the Software Kit, see"Additional units".

Selection and ordering data

SIDOOR ATE500E elevator door drive	
Control device with relay module	**6FB1211-5AT10-7AT2**
Control device with CAN module	**6FB1211-1AT10-7AT3**

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Technical specifications

Article number	6FB1211-5AT10-7AT2 SIDOOR ATE500E RELAY	6FB1211-1AT10-7AT3 SIDOOR ATE500E CAN
General information		
Mean time between failures (MTBF)	19 y	
Installation type/mounting		
Installation and mounting instructions	no direct solar radiation, final application-specific requirements must be observed; installation outside a control cabinet only in horizontal mounting position NFPA elevator environment: must be installed in a fire protection enclosure	
Supply voltage		
Design of the power supply	Via SIDOOR TRANSFORMER / NT40 or via DC	
Rated value (DC)	36 V; with MED280: At 24 V DC max. door speed of 500 mm/s; at 28.8 V DC max. door speed of 800 mm/s	
Input current		
I^2t, min.	30 $A^2 \cdot s$	
Encoder supply		
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!	
short-circuit proof	Yes	
Overload-proof	Yes	
24 V encoder supply		
• Output current, max.	400 mA	
Power		
Active power input	85 W	
Active power input, max.	540 W	
Active power input (standby mode)	5 W	6 W
Digital inputs		
Control inputs isolated	Yes	
Control inputs p-switching	Yes	
Input voltage		
• for signal "0", min.	-3 V	
• for signal "0", max.	5 V	
• for signal "1", min.	10 V	
• for signal "1", max.	28 V	
Input current		
• for signal "1", min.	3 mA	
• for signal "1", max.	15 mA	
Digital outputs		
Relay outputs		
- Switching capacity of contacts		
- at 30 V DC, min.	0.01 A	
- at 30 V DC, max.	1 A	0.5 A
- at 50 V DC, min.	0.01 A; 50 V DC switching voltage not released for NFPA-relevant countries	
- at 50 V DC, max.	1 A; 50 V DC switching voltage not released for NFPA-relevant countries	
- at 230 V AC, min.	0.01 A	
- at 230 V AC, max.	1 A	
Mechanical data		
Opening width of door, min.	0.3 m	
Opening width of door, max.	5 m	
Weight of door, max.	280 kg	
Operating cycle frequency of door, max.	180 1/h	
Kinetic energy, max.	75 J	
Counterweight		
• with SIDOOR MED280 direct drive, max.	6 kg	
Interfaces		
Interfaces/bus type	without	CANopen, CiA standard 301, profile 417
Number of bus nodes		32

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Technical specifications (continued)

Article number	6FB1211-5AT10-7AT2 SIDOOR ATE500E RELAY	6FB1211-1AT10-7AT3 SIDOOR ATE500E CAN
Standards, approvals, certificates		
Certificate of suitability according to EN 81	Yes	
CE mark	Yes	
UL approval	Yes	
EAC (formerly Gost-R)	Yes	
TÜV Inspectorate approval	Yes	
TÜV prototype tested	Yes	
China RoHS compliance	Yes	
Standard for safety	EN 61010-1 / EN 61010-2-201 / UL 61010-1 / UL 61010-2-201 / EN 81-20 / EN ISO 13849-1 Cat. 2 PL d / IEC 62061: SIL 2	
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	
• max.	50 °C	
• Remark	Bolt the controller onto a metal mounting surface so that thermal conductivity is ensured	
Ambient temperature during storage/transportation		
• Storage, min.	-40 °C	
• Storage, max.	85 °C	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
Dimensions		
Width	320 mm	
Height	60 mm	
Depth	80 mm	

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Overview



SIDOOR Transformer

The SIDOOR TRANSFORMER and SIDOOR TRANSFORMER UL are standard power supply units operated with 220-240 V AC, 50/60 Hz, from the SIDOOR product range. They can be used for controllers capable of controlling masses of up to 400 kg.

Selection and ordering data

SIDOOR Transformer power supply	**6FB1112-0AT20-2TR0**
SIDOOR Transformer power supply with UL approval	**6FB1112-0AT21-2TR0**

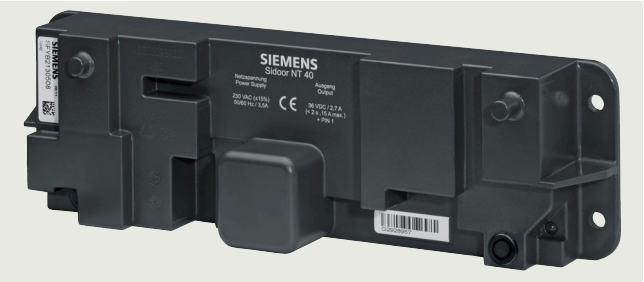
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Technical specifications

Article number	6FB1112-0AT20-2TR0 SIDOOR TRANSFORMER	6FB1112-0AT21-2TR0 SIDOOR TRANSFORMER UL
Installation type/mounting		
Mounting type	Hexagon head bolt M6, L > 70 mm	
Supply voltage		
relative symmetrical tolerance of the supply voltage	10 %	
Line frequency		
• permissible range, lower limit	50 Hz	
• permissible range, upper limit	60 Hz	
Mains filter		
• integrated	Yes	
Input current		
Current consumption, max.	1.6 A	
Operational current of fuse protection at input, min.	6 A	
Operational current of fuse protection at input, max.	10 A	
Tripping characteristic class of fuse protection at input	D6, C10	
Output voltage		
RMS value (pulsating DC voltage at full load)	17.3 V; at 230 V AC	
RMS value (pulsating DC voltage at full load), min.	16.5 V	
RMS value (pulsating DC voltage at full load), max.	18 V	
RMS value (pulsating DC voltage at 0.7 mA peak current), max.	27 V; At 264 V AC	
Output current		
Current output (rated value)	14.3 A; t on 2 s / t off 8 s	
Power		
Emitted active power, max.	115 W; Average value above 10 s	
Standards, approvals, certificates		
CE mark	Yes	
EAC (formerly Gost-R)	Yes	
RoHS conformity	Yes	
China RoHS compliance	Yes	
Standard for EMC	EN 12015 / EN 12016 / EN 61000-6-2 / EN 61000-6-3 / EN 61000-3-2 / EN 61000-3-3	
Standard for safety	Low Voltage Directive (LVD) 2014/35/EU	UL 61010-1, CSA C22.2 No. 61010-1-12, Low Voltage Directive (LVD) 2014/35/EU
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	
• max.	55 °C	
• Remark	No direct exposure to the sun	
Ambient temperature during storage/transportation		
• Storage, min.	-20 °C	
• Storage, max.	70 °C	
• Transportation, min.	-40 °C	
• Transportation, max.	70 °C	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
Cables		
Cable length		
• Input side	2 m	
• Output side	1.5 m	
Connection method		
Design of electrical connection at input	SCHUKO connector DIN 49.441, CEE7/VII	equipped with ferrules
Dimensions		
Width	145 mm	
Height	65 mm	
Depth	126 mm	

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Overview



The SIDOOR NT40 switched-mode power supply unit is operated with 230 V AC (± 15 %), 50/60 Hz, to power the elevator door controllers.

It is especially suitable for door systems with high door weights.

On the output side, the power supply unit delivers a voltage of 36 V DC (± 3 %) SELV at a rated output power of < 100 W.

In order to enable fast acceleration/deceleration of the doors by the controller, the device can briefly (< 2 s) deliver a current of 15 A (corresponds to a short-time power output of 540 W).

Selection and ordering data

SIDOOR NT40 switched-mode power supply	**6FB1112-0AT20-3PS0**

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Technical specifications

Article number	6FB1112-0AT20-3PS0 SIDOOR NT40
Installation type/mounting	
Mounting type	Four 5 mm screws
Supply voltage	
Rated value (AC)	230 V
relative symmetrical tolerance of the supply voltage	15 %
Line frequency	
• permissible range, lower limit	50 Hz
• permissible range, upper limit	60 Hz
Input current	
Current consumption for 2 s, max.	3.5 A
Rated value at 230 V AC	0.7 A
Operational current of fuse protection at input, min.	6 A
Operational current of fuse protection at input, max.	10 A
Tripping characteristic class of fuse protection at input	B
Output voltage	
Rated value (DC)	36 V; SELV
Relative symmetrical tolerance of the output voltage	3 %
Output current	
Current output (rated value)	2.5 A
Temporary overload current (for 2 s maximum)	15 A
Power	
Active power input, max.	100 W
Emitted active power, max.	100 W
Emitted active power (restricted to 2 s)	540 W
Efficiency at 230 V AC (with 100 W emitted active power)	90 %
Active apparent power, max.	650 V·A
Standards, approvals, certificates	
CE mark	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Standard for EMC	EMC Directive 2004/108/EC, EN 12015, EN 12016
Standard for safety	EN 61010-1 / EN 61010-2-201
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	55 °C
• Remark	No direct exposure to the sun
Ambient temperature during storage/transportation	
• Storage, min.	-20 °C
• Storage, max.	70 °C
• Transportation, min.	-40 °C
• Transportation, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Cables	
Cable length	
• Input side	2 m
• Output side	1.5 m
Connection method	
Design of electrical connection at input	SCHUKO connector DIN 49.441, CEE7/VII

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Technical specifications (continued)

Article number	6FB1112-0AT20-3PS0 SIDOOR NT40
Dimensions	
Width	270 mm
Height	55 mm
Depth	80 mm

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Overview



SIDOOR Software Kit

The scope of delivery of the SIDOOR Software Kit includes an installation CD.

The CD includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

Note:

Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

Selection and ordering data

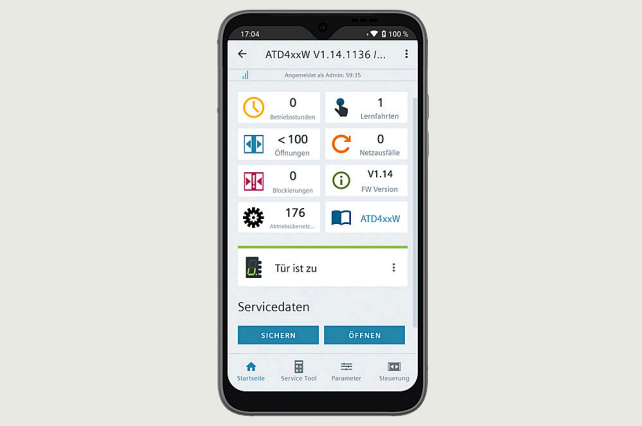
SIDOOR Software Kit	**6FB1105-0AT01-6SW0**

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Overview



SIDOOR LINK



SIDOOR SUPPORT App

A Bluetooth LE 5.0 connection can be established via the SIDOOR LINK to a smartphone or tablet with the SIDOOR SUPPORT app installed.

The SIDOOR SUPPORT app enables easy commissioning and maintenance of a door system with a SIDOOR controller, is suitable for smartphones or tablets as of Android version 9 and is available from the Google Play store.

The SIDOOR LINK is connected to the SIDOOR controller via the respective cable.

You do not need to open the cover of the controller to do this.

Note:
If the SIDOOR SUPPORT (app) is in the "Quick adjustment" or "Total adjustment" menu, the drive commands of the controller are blocked via the command inputs.

Selection and ordering data

SIDOOR LINK, SIDOOR Service adapter For commissioning and maintaining the SIDOOR controllers via SIDOOR SUPPORT (app)	**6FB1305-0AT00-0AS4**

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Overview

SIDOOR geared motors are a combination of gear unit, motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free, variable speed drive unit comprises a DC motor with non-self-locking gearing.

The geared motors must be selected according to the mass to be moved. Two different versions are available for each of the SIDOOR M2 to SIDOOR M5 geared motors, with gear output on the left or on the right: The gear outlet direction is defined as left or right when viewing the gear unit from the front.

- SIDOOR M2 geared motors (max. door weight 120 kg)
  - SIDOOR M2 L (pinion left) 6FB1103-0AT10-5MA0
  - SIDOOR M2 R (pinion right) 6FB1103-0AT11-5MA0
- SIDOOR M3 geared motors (max. door weight 180 kg)
  - SIDOOR M3 L (pinion left) 6FB1103-0AT10-4MB0
  - SIDOOR M3 R (pinion right) 6FB1103-0AT11-4MB0
- SIDOOR M4 geared motors (max. door weight 400 kg)
  - SIDOOR M4 L (pinion left) 6FB1103-0AT10-3MC0
  - SIDOOR M4 R (pinion right) 6FB1103-0AT11-3MC0
- SIDOOR M5 geared motors (max. door weight 600 kg)
  - SIDOOR M5 L (pinion left) 6FB1103-0AT10-3MD0
  - SIDOOR M5 R (pinion right) 6FB1103-0AT11-3MD0



Geared motors: SIDOOR M2 L 6FB1103-0AT10-5MA0 (version with pinion left), SIDOOR M3 L 6FB1103-0AT10-4MB0 (version with pinion left), SIDOOR M4 L 6FB1103-0AT10-3MC0 (version with pinion left), SIDOOR M5 L 6FB1103-0AT10-3MD0 (version with pinion left) (Images are shown in the order from bottom to top)

Selection and ordering data

SIDOOR M2 geared motors	
M2 L	**6FB1103-0AT10-5MA0**
M2 R	**6FB1103-0AT11-5MA0**
SIDOOR M3 geared motors	
M3 L	**6FB1103-0AT10-4MB0**
M3 R	**6FB1103-0AT11-4MB0**
SIDOOR M4 geared motors	
M4 L	**6FB1103-0AT10-3MC0**
M4 R	**6FB1103-0AT11-3MC0**
SIDOOR M5 geared motors	
M5 L	**6FB1103-0AT10-3MD0**
M5 R	**6FB1103-0AT11-3MD0**

Accessories

The following accessories are available for the SIDOOR M2 to SIDOOR M5 geared motors:

- Rubber-metal anti-vibration mount for low-noise door operation
  - 6FB1104-0AT02-0AD0 for SIDOOR M2 and SIDOOR M3 geared motors (door weights up to 180 kg)
  - 6FB1104-0AT01-0AD0 for SIDOOR M4 and SIDOOR M5 geared motors (door weights up to 600 kg)
- Mounting bracket 6FB1104-0AT01-0AS0 for the geared motor mount for flexible accommodation of the rubber-bonded metal

See "Accessories".

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Technical specifications

Article number	6FB1103-0AT1-0-5MA0	6FB1103-0AT1-1-5MA0	6FB1103-0AT1-0-4MB0	6FB1103-0AT1-1-4MB0	6FB1103-0AT1-0-3MC0	6FB1103-0AT1-1-3MC0	6FB1103-0AT1-0-3MD0	6FB1103-0AT1-1-3MD0
	SIDOOR M2 L	SIDOOR M2 R	SIDOOR M3 L	SIDOOR M3 R	SIDOOR M4 L	SIDOOR M4 R	SIDOOR M5 L	SIDOOR M5 R
Supply voltage								
Rated value (DC)	24 V		30 V					
Input current								
Operational current (rated value)	1.8 A		4 A				7.5 A	
Power								
Active power input	43 W		120 W				225 W	
Mechanical data								
Torque of the rotary operating mechanism (rated value)	1.05 N·m		3 N·m				6.8 N·m	
Speed, max.	0.5 m/s		0.65 m/s		0.75 m/s		0.5 m/s	
Gear ratio	15							
Number of pulses per revolution, max.	100							
Weight of door, max.	120 kg		180 kg		400 kg		600 kg	
Standards, approvals, certificates								
CE mark	Yes							
UL approval	No		Yes					
EAC (formerly Gost-R)	Yes							
TÜV Inspectorate approval	Yes							
China RoHS compliance	Yes							
Ambient conditions								
Ambient temperature during operation								
• min.	-20 °C							
• max.	50 °C							
Ambient temperature during storage/transportation								
• Storage, min.	-40 °C							
• Storage, max.	85 °C							
Dimensions								
Height of motor	90 mm		98 mm		115 mm		124 mm	
Length of motor	207 mm		236 mm		275 mm		344 mm	
Diameter of motor	48 mm		63 mm				80 mm	
Width of gear unit, including drive pinion	90 mm		85 mm		105 mm		111 mm	

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Overview



SIDOOR MED280 direct drive

SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor with non-self-locking gearing.

Direct drives are designed for certain masses and can control both drive directions.

- SIDOOR MED280 direct drive for max. 280 kg (6FB1203-0AT12-7DA0)

Selection and ordering data

SIDOOR MED280 direct drive Motor for door control, for max. dynamic door weights of 280 kg	**6FB1203-0AT12-7DA0**

Accessories

The following accessories are available for the SIDOOR MED280 direct drives:

- Motor holder for flexible integration in the door system. Choice of cable outlets.
  - SIDOOR motor holder 6FB1104-0AT03-0AD0
  - Mounting bracket 6FB1104-0AT01-0AS0 for direct drives for flexible accommodation of the motor holder

See "Accessories".

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Technical specifications

Article number	6FB1203-0AT12-7DA0 SIDOOR MED280
Supply voltage	
Rated value (DC)	24 V
Input current	
Operational current (rated value)	9.7 A
Power	
Active power input	233 W
Mechanical data	
Torque of the rotary operating mechanism (rated value)	4.7 N·m
Speed, max.	0.8 m/s
Number of pulses per revolution, max.	1 024
Weight of door, max.	280 kg
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	70 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	85 °C
Dimensions	
Width of motor	160 mm
Height of motor	140 mm
Length of motor	56 mm
• including drive pinion	91 mm

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Overview

A range of accessories is available for SIDOOR elevator door drive systems with geared motors:

This is necessary to ensure low-noise operation of the door leaves by the controller. The geared motors can be optimally integrated into the respective door drive system.

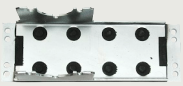
Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR M2 and SIDOOR M3 geared motors.
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for SIDOOR M4 and SIDOOR M5 geared motors.



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0

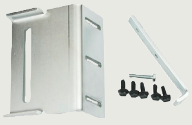
Mounting brackets

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for the geared motors for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit. For setting the toothed belt to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

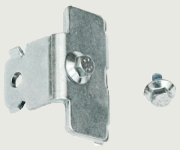
Door clutch holder

The door clutch holder serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

A door clutch holder is available for each toothed belt width:

- Width 12 mm: 6FB1104-0AT01-0CP0
- Width 14 mm: 6FB1104-0AT02-0CP0

Overview (continued)

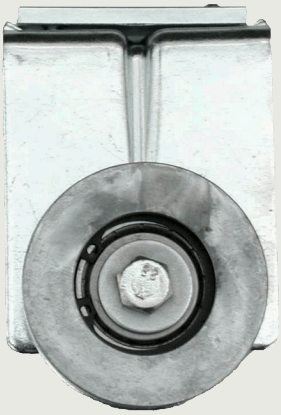


Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system.

The STS toothed belt is redirected via this deflector unit (toothed belt width 12 mm or 14 mm). .



Deflector unit 6FB1104-0AT03-0AS0

STS toothed belt

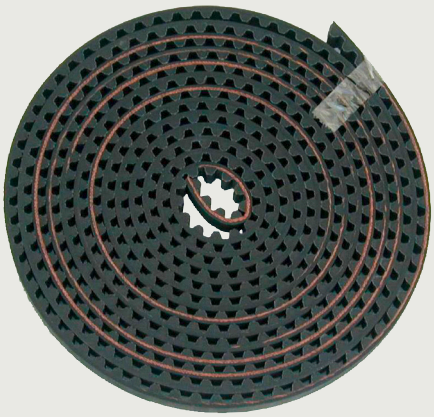
The door system is moved between the end positions of the door using the STS toothed belts. Two different toothed belt lengths can be ordered for each toothed belt width.

Toothed belt width 12 mm:

- Length 4 m: 6FB1104-0AT01-0AB0
- Length 45 m: 6FB1104-0AT02-0AB0

Toothed belt width 14 mm:

- Length 4 m: 6FB1104-0AT03-0AB0
- Length 55 m: 6FB1104-0AT04-0AB0



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Overview (continued)

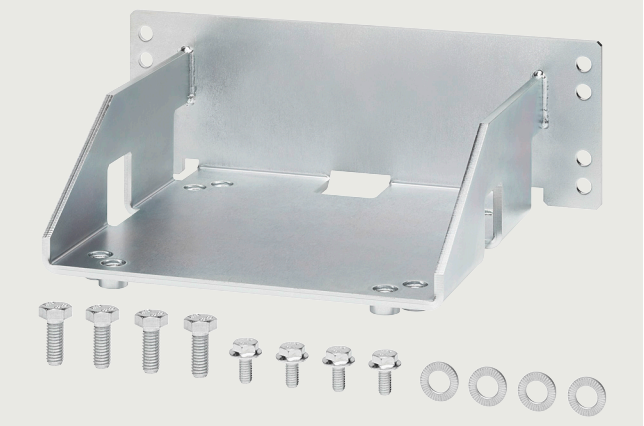
Toothed belt 6FB1104-0AT01-0AB0, length 4 m



Toothed belt 6FB1104-0AT02-0AB0, length 45 m

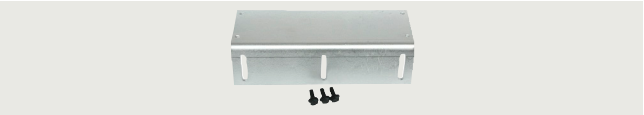
A range of accessories is available for SIDOOR elevator door systems with EC technology:

Motor holder 6FB1104-0AT03-0AD0 for accommodation of the SIDOOR MED280 direct drive.



Mounting bracket:

- For mounting the SIDOOR motor holder 6FB1104-0AT01-0AS0



- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (large) 6FB1104-0AT05-0AS4

Overview (continued)



SIDOOR mounting bracket, large

- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (small) 6FB1104-0AT05-0AS5



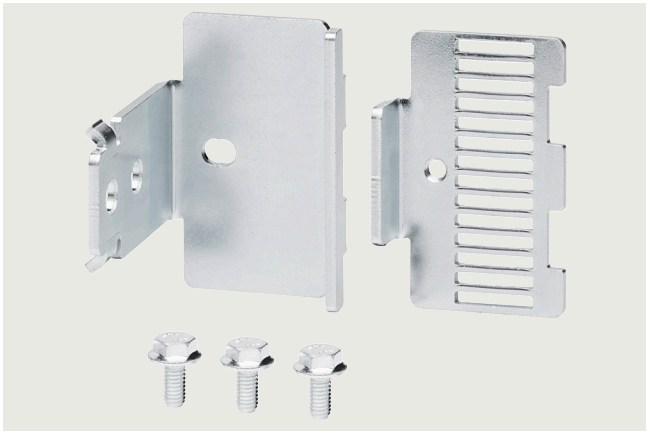
SIDOOR mounting bracket, small

Door clutch holder

- For attaching both ends of the toothed belt and connecting the respective door leaf to the toothed belt, width 20 mm 6FB1104-0AT05-0AS1

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Overview (continued)



SIDOOR door clutch holder

Deflector unit:
For attaching the SIDOOR toothed belt and fixing to the door
6FB1104-0AT07-0AS0



SIDOOR deflector unit

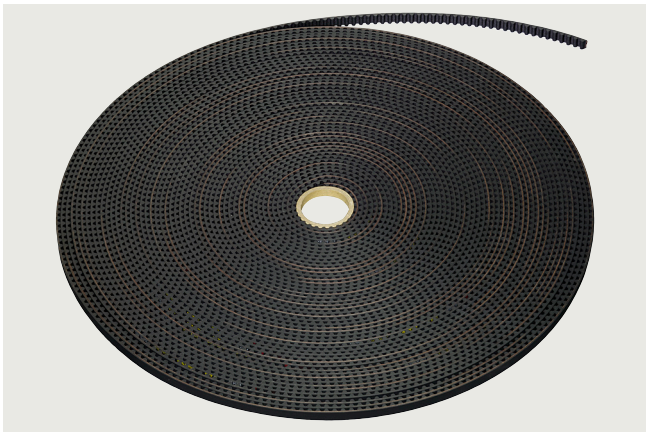
STD toothed belt
As a connection between the door system and the end positions of the door
Toothed belt width 20 mm. Length 4 m 6FB1104-0AT05-0AB0

Overview (continued)



SIDOOR toothed belt, small

Toothed belt width 20 mm. Length 45 m 6FB1104-0AT06-0AB1



SIDOOR toothed belt, large

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Selection and ordering data

Elevator door systems with geared motors	
Rubber-metal anti-vibration mounts for geared motors	
• SIDOOR rubber-metal anti-vibration mount for SIDOOR M2 and SIDOOR M3 geared motors	**6FB1104-0AT02-0AD0**
• SIDOOR rubber-metal anti-vibration mount for SIDOOR M4 and SIDOOR M5 geared motors	**6FB1104-0AT01-0AD0**
Mounting bracket	
• SIDOOR mounting bracket for geared motor	**6FB1104-0AT01-0AS0**
• SIDOOR mounting bracket with tensioning device for deflector pulley	**6FB1104-0AT02-0AS0**
SIDOOR door clutch holder	
• For toothed belt, width 12 mm	**6FB1104-0AT01-0CP0**
• For toothed belt, width 14 mm	**6FB1104-0AT02-0CP0**
SIDOOR deflector unit	**6FB1104-0AT03-0AS0**
SIDOOR deflector roller for the STS toothed belt	**6FB1104-0AT04-0AS2**
SIDOOR STS toothed belt	
Width 12 mm	
• 4 m	**6FB1104-0AT01-0AB0**
• 45 m	**6FB1104-0AT02-0AB0**
SIDOOR STS toothed belt	
Width 14 mm	
• 4 m	**6FB1104-0AT03-0AB0**
• 55 m	**6FB1104-0AT04-0AB0**
Elevator door systems with EC technology	
Motor holder for SIDOOR MED280 direct drive	**6FB1104-0AT03-0AD0**
Mounting bracket for mounting the motor holder	**6FB1104-0AT01-0AS0**
Mounting bracket with tensioning device for mounting the deflector unit	
• Large	**6FB1104-0AT05-0AS4**
• Small	**6FB1104-0AT05-0AS5**
SIDOOR door clutch holder For toothed belt, width 20 mm	**6FB1104-0AT05-0AS1**
SIDOOR deflector unit	**6FB1104-0AT07-0AS0**
SIDOOR STD toothed belt Width 20 mm	
• 4 m	**6FB1104-0AT05-0AB0**
• 55 m	**6FB1104-0AT06-0AB1**

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Application

The door drive system consists of a controller and a maintenance-free drive unit, the geared motors.

Control devices are electronic controllers connected to the power supply via an external power supply unit. They are generally connected to the higher-level controller via digital or fieldbus interfaces, and can be configured via a user interface.

These controllers are available for selection for industrial applications:

- SIDOOR ATD401W, digital I/O, masses of up to 700 kg
- SIDOOR ATD420W, connected to the higher-level controller via PROFIBUS interface, masses of up to 700 kg
- SIDOOR ATD430W, connected to the higher-level controller via PROFINET interface, masses of up to 700 kg

The safe functions – force limitation, energy limitation and end position detection – fulfill the requirements according to EN ISO 13849-1 for Category 2 and Performance Level d. The drives are suitable for power-operated guards according to EN ISO 14120

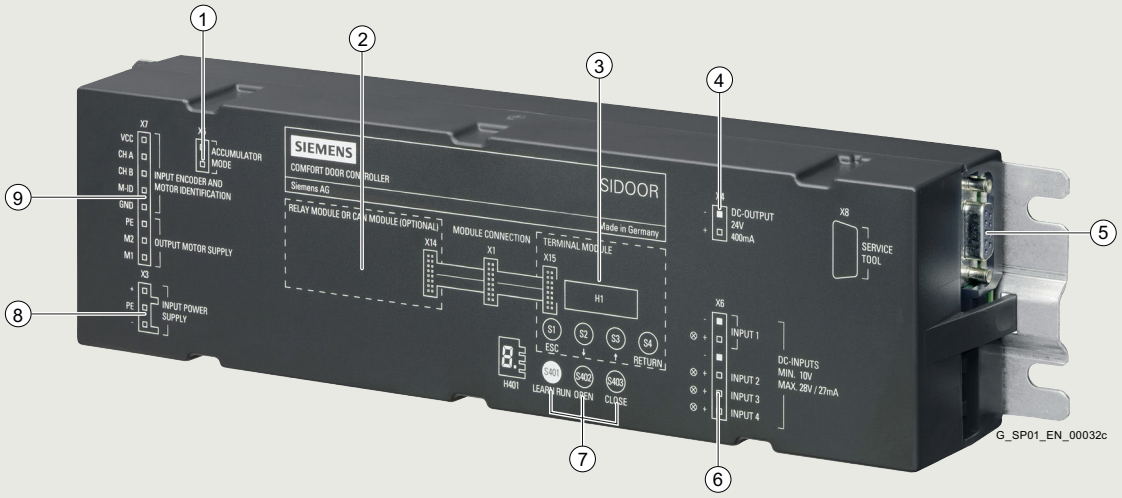
Geared motors form the maintenance-free drive unit in the door drive. The geared motors are DC motors with non-self-locking gearing, and are speed-controlled. The set force and speed limits are not exceeded.

Operation of the named door drives does not require limit switches. The door width and the "OPEN"/"CLOSE" positions are determined automatically.

The power is transmitted by a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with 2 door clutch holders. This enables it to drive both one-sided and centrally-opening doors. The accessories are not included in the scope of supply, see "Accessories".

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Overview



1 Digital input
2 Fieldbus interface
3 Terminal module
4 Connection for 24 V DC/400 mA output voltage
5 Connection
- Software Kit
6 Input signal connection
7 Control panel
8 Connection for
16.8 to 36 V DC input voltage
for power supply connection
9 Motor connection

SIDOOR ATD401W

The SIDOOR ATD401W enables the quick, easy and versatile installation, configuration and operation of a wide range of industrial door drive systems.

- Relay module design
- Masses of up to 700 kg
- Automatic determination of the door weight and friction during the learn run
- Digital inputs, for example for direct connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
- 3 relay outputs for position feedback and reversing feedback
- Operating temperature -20 to +50 °C
- Flexible motor management, automatic recognition of the geared motor
- Opening width 0.3 to 5 m
- Auxiliary voltage output 24 V DC ± 15%; 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit-proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or the SIDOOR LINK with the SIDOOR SUPPORT App

Selection and ordering data

SIDOOR ATD401W Control device, relay module design	**6FB1141-1AT11-3WE2**

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Technical specifications

Article number	6FB1141-1AT11-3WE2 SIDOOR ATD401W
Installation type/mounting	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
Supply voltage	
Design of the power supply	Via SIDOOR TRANSFORMER / SIDOOR TRANSFORMER UL / NT40 / SITOP PSU8200 13 A, 36 V or via DC
Rated value (DC)	36 V
Input current	
I^2t, min.	30 $A^2 \cdot s$
Encoder supply	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
24 V encoder supply	
• Output current, max.	400 mA
Power	
Active power input	145 W
Active power input, max.	540 W
Active power input (standby mode)	5 W
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Input voltage	
• for signal "0", min.	-3 V
• for signal "0", max.	5 V
• for signal "1", min.	10 V
• for signal "1", max.	28 V
Input current	
• for signal "1", min.	9 mA
• for signal "1", max.	27 mA
Digital outputs	
Relay outputs	
- Switching capacity of contacts	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	1 A
Mechanical data	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J
Interfaces	
Interfaces/bus type	without
Standards, approvals, certificates	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Standard for safety	EN 61010-1 / EN 61010-2-201 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d

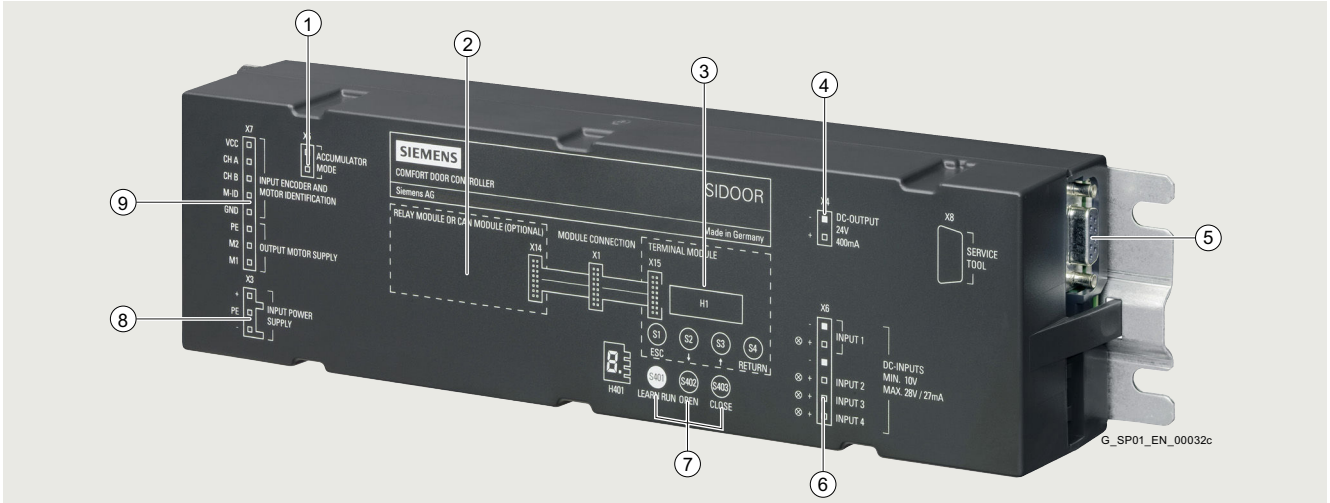
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Technical specifications (continued)

Article number	6FB1141-1AT11-3WE2 SIDOOR ATD401W
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	50 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

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Overview



1 Digital input
2 Fieldbus interface
3 Terminal module
4 Connection for 24 V DC/400 mA output voltage
5 Connection
- Software Kit
6 Input signal connection
7 Control panel
8 Connection for
16.8 to 36 V DC input voltage
for power supply connection
9 Motor connection

SIDOOR ATD420W

The SIDOOR ATD420W can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD420W controller offers complete flexibility for integration with a machine tool via PROFIBUS

- Masses of up to 700 kg
- Integrated PROFIBUS interface
- 5 freely parameterizable digital inputs for signal acquisition, of which one input is optionally parameterizable for:
  - Connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connection of a pressure-sensitive edge according to ISO 13856-2
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run
- Parameter assignment and analysis of the door parameters via PROFIdrive
- Operating temperature -20 to +50 °C
- Flexible motor management, i.e. automatic recognition of the geared motor
- Assisted drive (motor-assisted movement of the door)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC ±15 % and 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or the SIDOOR LINK with the SIDOOR SUPPORT App

Selection and ordering data

SIDOOR ATD420W Control device, integrated PROFIBUS interface	**6FB1141-2AT10-3WE2**

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Technical specifications

Article number	6FB1141-2AT10-3WE2 SIDOOR ATD420W
Installation type/mounting	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
Supply voltage	
Design of the power supply	Via SIDOOR TRANSFORMER / SIDOOR TRANSFORMER UL / NT40 / SITOP PSU8200 13 A, 36 V or via DC
Rated value (DC)	36 V
Input current	
I^2t, min.	30 $A^2 \cdot s$
Encoder supply	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
24 V encoder supply	
• Output current, max.	400 mA
Power	
Active power input	145 W
Active power input, max.	540 W
Active power input (standby mode)	5 W
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Input voltage	
• for signal "0", min.	-3 V
• for signal "0", max.	5 V
• for signal "1", min.	10 V
• for signal "1", max.	28 V
Input current	
• for signal "1", min.	9 mA
• for signal "1", max.	27 mA
Digital outputs	
Relay outputs	
- Switching capacity of contacts	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	0.5 A
Mechanical data	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J
Interfaces	
Interfaces/bus type	PROFIBUS according to IEC 61784-3
Number of bus nodes	32
Standards, approvals, certificates	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
PNO certificate	Yes
China RoHS compliance	Yes
Standard for safety	EN 61010-1 / EN 61010-2-201 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d

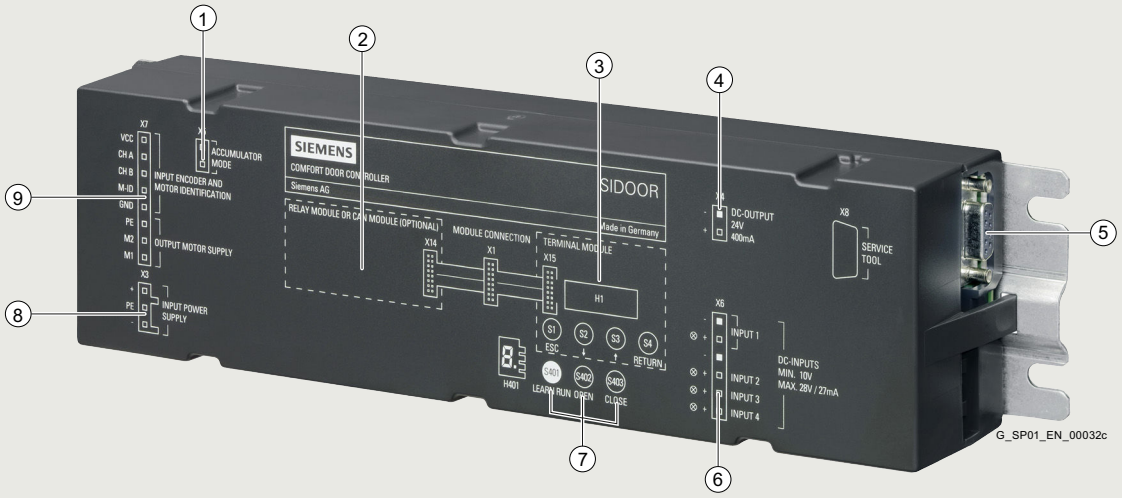
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Technical specifications (continued)

Article number	6FB1141-2AT10-3WE2 SIDOOR ATD420W
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	50 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

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Overview



1 Digital input
2 Fieldbus interface
3 Terminal module
4 Connection for 24 V DC/400 mA output voltage
5 Connection
- Software Kit
6 Input signal connection
7 Control panel
8 Connection for
16.8 to 36 V DC input voltage
for power supply connection
9 Motor connection

SIDOOR ATD430W

The SIDOOR ATD430W machine tool door drive can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD430W controller offers complete flexibility for integration into a machine tool via PROFINET.

- Masses of up to 700 kg
- Integrated PROFINET interface (2 RJ45 ports)
- 5 freely parameterizable digital inputs for signal acquisition, of which one input is optionally parameterizable for:
  - Connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connecting a pressure-sensitive edge according to ISO 13856-22, relay contacts for additional position signals
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run
- Parameter assignment and analysis of the door parameters
- Operating temperature -20 to +50 °C
- Flexible motor management, i.e. automatic recognition of the geared motor
- Assisted drive (motor-assisted movement of the door)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC ±15 % and 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit-proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or the SIDOOR LINK with the SIDOOR SUPPORT App

Selection and ordering data

SIDOOR ATD430W Control device, integrated PROFINET interface (2 RJ45 ports)	**6FB1141-3AT10-3WE2**

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Technical specifications

Article number	6FB1141-3AT10-3WE2 SIDOOR ATD430W
Installation type/mounting	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
Supply voltage	
Design of the power supply	Via SIDOOR TRANSFORMER / SIDOOR TRANSFORMER UL / NT40 / SITOP PSU8200 13 A, 36 V or via DC
Rated value (DC)	36 V
Input current	
I^2t, min.	30 $A^2 \cdot s$
Encoder supply	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
24 V encoder supply	
• Output current, max.	400 mA
Power	
Active power input	145 W
Active power input, max.	540 W
Active power input (standby mode)	5 W
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Input voltage	
• for signal "0", min.	-3 V
• for signal "0", max.	5 V
• for signal "1", min.	10 V
• for signal "1", max.	28 V
Input current	
• for signal "1", min.	9 mA
• for signal "1", max.	27 mA
Digital outputs	
Relay outputs	
- Switching capacity of contacts	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	0.5 A
Mechanical data	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J
Interfaces	
Interfaces/bus type	PROFINET IO according to Conformance Class C
Standards, approvals, certificates	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
PNO certificate	Yes
China RoHS compliance	Yes
Standard for safety	EN 61010-1 / EN 61010-2-201 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d

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Technical specifications (continued)

Article number	6FB1141-3AT10-3WE2 SIDOOR ATD430W
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	50 °C
• Remark	Screw control device thermally conductive onto a metallic mounting surface or standard rail mounting, otherwise the maximum operating temperature is only 40 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

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Overview

The power supplies can be used for the various SIDOOR controllers:
SIDOOR Transformer and Transformer UL power supply units: For masses of up to 400 kg and moderate performance.

- SIDOOR AT40 and ATE500E elevator door drives
- SIDOOR ATD4xxW machine tool door drives
- SIDOOR ATE53xS platform screen door drives

SIDOOR NT40 switched mode power supply: For masses of up to 600 kg and maximum performance.

- SIDOOR AT40 and ATE500E elevator door drives
- SIDOOR ATD4xxW machine tool door drives

SITOP PSU8200 3-phase stabilized power supply, 36 V DC/13 A: For masses of up to 700 kg and maximum performance.

- SIDOOR ATD4xxW machine tool door drives

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Overview



SIDOOR Transformer

The SIDOOR TRANSFORMER and SIDOOR TRANSFORMER UL are standard power supply units operated with 220-240 V AC, 50/60 Hz, from the SIDOOR product range. They can be used for controllers capable of controlling masses of up to 400 kg.

Selection and ordering data

SIDOOR Transformer power supply	**6FB1112-0AT20-2TR0**
SIDOOR Transformer power supply with UL approval	**6FB1112-0AT21-2TR0**

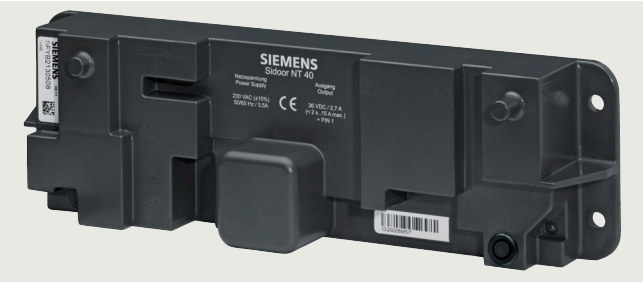
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Technical specifications

Article number	6FB1112-0AT20-2TR0 SIDOOR TRANSFORMER	6FB1112-0AT21-2TR0 SIDOOR TRANSFORMER UL
Installation type/mounting		
Mounting type	Hexagon head bolt M6, L > 70 mm	
Supply voltage		
relative symmetrical tolerance of the supply voltage	10 %	
Line frequency		
• permissible range, lower limit	50 Hz	
• permissible range, upper limit	60 Hz	
Mains filter		
• integrated	Yes	
Input current		
Current consumption, max.	1.6 A	
Operational current of fuse protection at input, min.	6 A	
Operational current of fuse protection at input, max.	10 A	
Tripping characteristic class of fuse protection at input	D6, C10	
Output voltage		
RMS value (pulsating DC voltage at full load)	17.3 V; at 230 V AC	
RMS value (pulsating DC voltage at full load), min.	16.5 V	
RMS value (pulsating DC voltage at full load), max.	18 V	
RMS value (pulsating DC voltage at 0.7 mA peak current), max.	27 V; At 264 V AC	
Output current		
Current output (rated value)	14.3 A; t on 2 s / t off 8 s	
Power		
Emitted active power, max.	115 W; Average value above 10 s	
Standards, approvals, certificates		
CE mark	Yes	
EAC (formerly Gost-R)	Yes	
RoHS conformity	Yes	
China RoHS compliance	Yes	
Standard for EMC	EN 12015 / EN 12016 / EN 61000-6-2 / EN 61000-6-3 / EN 61000-3-2 / EN 61000-3-3	
Standard for safety	Low Voltage Directive (LVD) 2014/35/EU	UL 61010-1, CSA C22.2 No. 61010-1-12, Low Voltage Directive (LVD) 2014/35/EU
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	
• max.	55 °C	
• Remark	No direct exposure to the sun	
Ambient temperature during storage/transportation		
• Storage, min.	-20 °C	
• Storage, max.	70 °C	
• Transportation, min.	-40 °C	
• Transportation, max.	70 °C	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
Cables		
Cable length		
• Input side	2 m	
• Output side	1.5 m	
Connection method		
Design of electrical connection at input	SCHUKO connector DIN 49.441, CEE7/VII	equipped with ferrules
Dimensions		
Width	145 mm	
Height	65 mm	
Depth	126 mm	

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Overview



The SIDOOR NT40 switched-mode power supply unit is operated with 230 V AC (± 15 %), 50/60 Hz, to power the elevator door controllers.

It is especially suitable for door systems with high door weights.

On the output side, the power supply unit delivers a voltage of 36 V DC (± 3 %) SELV at a rated output power of < 100 W.

In order to enable fast acceleration/deceleration of the doors by the controller, the device can briefly (< 2 s) deliver a current of 15 A (corresponds to a short-time power output of 540 W).

Selection and ordering data

SIDOOR NT40 switched-mode power supply	**6FB1112-0AT20-3PS0**

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Technical specifications

Article number	6FB1112-0AT20-3PS0 SIDOOR NT40
Installation type/mounting	
Mounting type	Four 5 mm screws
Supply voltage	
Rated value (AC)	230 V
relative symmetrical tolerance of the supply voltage	15 %
Line frequency	
• permissible range, lower limit	50 Hz
• permissible range, upper limit	60 Hz
Input current	
Current consumption for 2 s, max.	3.5 A
Rated value at 230 V AC	0.7 A
Operational current of fuse protection at input, min.	6 A
Operational current of fuse protection at input, max.	10 A
Tripping characteristic class of fuse protection at input	B
Output voltage	
Rated value (DC)	36 V; SELV
Relative symmetrical tolerance of the output voltage	3 %
Output current	
Current output (rated value)	2.5 A
Temporary overload current (for 2 s maximum)	15 A
Power	
Active power input, max.	100 W
Emitted active power, max.	100 W
Emitted active power (restricted to 2 s)	540 W
Efficiency at 230 V AC (with 100 W emitted active power)	90 %
Active apparent power, max.	650 V·A
Standards, approvals, certificates	
CE mark	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Standard for EMC	EMC Directive 2004/108/EC, EN 12015, EN 12016
Standard for safety	EN 61010-1 / EN 61010-2-201
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	55 °C
• Remark	No direct exposure to the sun
Ambient temperature during storage/transportation	
• Storage, min.	-20 °C
• Storage, max.	70 °C
• Transportation, min.	-40 °C
• Transportation, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Cables	
Cable length	
• Input side	2 m
• Output side	1.5 m
Connection method	
Design of electrical connection at input	SCHUKO connector DIN 49.441, CEE7/VII

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Technical specifications (continued)

Article number	6FB1112-0AT20-3PS0 SIDOOR NT40
Dimensions	
Width	270 mm
Height	55 mm
Depth	80 mm

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Overview



The 3-phase SITOP PSU8200 are technology power supplies for challenging solutions. The wide-range input allows a connection to almost any electricity supply network worldwide and ensures a high degree of safety even if there are large voltage fluctuations.

To further increase 36 V availability, SITOP power supplies can be combined with redundancy modules.

Product highlights

- 3-phase, 36 V DC / 13 A
- Input voltage 320 ... 575 V AC
- Up to 94% efficiency
- cULus, cCSAus, ABS and DNV GL certifications

Selection and ordering data

SITOP PSU8200 3-phase, 36 V DC/13 A Stabilized power supply Input: 400 ... 500 V 3 AC Output: 36 V DC/13 A	**6EP3446-8SB10-0AY0**

Accessories

SITOP RED1200 redundancy modules	For more information, visit: www.siemens.com/sitop-redundancy/mall
Device identification labels	**3RT2900-1SB20**

Technical specifications

Article number	**6EP3446-8SB10-0AY0**
product brand name	**SITOP**
type of current supply	**36 V/13 A**
General information	
Technical Product Detail Page	https://i.siemens.com/1P6EP3446-8SB10-0AY0
input	
type of the power supply network	3-phase AC
supply voltage at AC	
• minimum rated value	400 V
• maximum rated value	500 V
• initial value	320 V
• full-scale value	575 V
wide range input	Yes
buffering time for rated value of the output current in the event of power failure minimum	15 ms
operating condition of the mains buffering	at Vin = 400 V
line frequency	50 Hz/60 Hz
line frequency	47 ... 63 Hz
input current	
• at rated input voltage 400 V	1.2 A
• at rated input voltage 500 V	1 A
current limitation of inrush current at 25 °C maximum	16 A
I2t value maximum	0.8 $A^2 \cdot s$
fuse protection type	none
fuse protection type in the feeder	Required: 3-pole connected miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)
output	
voltage curve at output	Controlled, isolated DC voltage
output voltage at DC rated value	36 V
output voltage	
• at output 1 at DC rated value	36 V
	36 V
output voltage adjustable	Yes; via potentiometer
adjustable output voltage	36 ... 42 V; max. 480 W
relative overall tolerance of the voltage	3 %
relative control precision of the output voltage	
• on slow fluctuation of input voltage	0.1 %
• on slow fluctuation of ohm loading	0.2 %
residual ripple	
• maximum	100 mV
voltage peak	
• maximum	200 mV
display version for normal operation	Green LED for 36 V OK
type of signal at output	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for 36 V OK
behavior of the output voltage when switching on	No overshoot of Vout (soft start)
response delay maximum	2.5 s

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Technical specifications (continued)

Article number	6EP3446-8SB10-0AY0
product brand name	SITOP
type of current supply	36 V/13 A
voltage increase time of the output voltage	
• maximum	500 ms
output current	
• rated value	13 A
• rated range	0 ... 13 A; +60 ... +70 °C: Derating 2%/K
	10.1 ... 19.9 A
supplied active power typical	468 W
short-term overload current	
• at short-circuit during operation typical	39 A
duration of overloading capability for excess current	
• at short-circuit during operation	25 ms
constant overload current	
• on short-circuiting during the start-up typical	14 A
bridging of equipment	Yes; switchable characteristic
number of parallel-switched equipment resources	2
efficiency	
efficiency in percent	94 %
power loss [W]	
• at rated output voltage for rated value of the output current typical	30 W
closed-loop control	
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.1 %
relative control precision of the output voltage load step of resistive load 50/100/50 % typical	1 %
setting time	
• load step 50 to 100% typical	0.2 ms
• load step 100 to 50% typical	0.2 ms
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	2 %
setting time	
• load step 10 to 90% typical	0.2 ms
• load step 90 to 10% typical	0.2 ms
• maximum	10 ms
protection and monitoring	
design of the overvoltage protection	< 48 V
property of the output short-circuit proof	Yes
design of short-circuit protection	Alternatively, constant current characteristic approx. 14 A or latching shutdown
• typical	14 A
overcurrent overload capability	
• in normal operation	overload capability 150 % Iout rated up to 5 s/min
enduring short circuit current RMS value	
• typical	14 A
display version for overload and short circuit	LED yellow for "overload", LED red for "latching shutdown"

Technical specifications (continued)

Article number	6EP3446-8SB10-0AY0
product brand name	SITOP
type of current supply	36 V/13 A
safety	
galvanic isolation between input and output	Yes
galvanic isolation	Output voltage: SELV, ES1 (IEC 62368-1), DVC As (IEC 61204-7)
operating resource protection class	Class I
leakage current	
• maximum	3.5 mA
• typical	0.9 mA
protection class IP	IP20
EMC	
standard	
• for emitted interference	EN 55022 Class B
• for mains harmonics limitation	EN 61000-3-2
• for interference immunity	EN 61000-6-2
standards, specifications, approvals	
certificate of suitability	
• CE marking	Yes
• UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259
• EAC approval	Yes
• Regulatory Compliance Mark (RCM)	Yes
• NEC Class 2	No
• SEMI F47	Yes
type of certification	
• CB-certificate	Yes
standards, specifications, approvals hazardous environments	
certificate of suitability	
• IECEx	No
• ATEX	No
• ULhazloc approval	No
• FM registration	No
standards, specifications, approvals marine classification	
shipbuilding approval	Yes
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• French marine classification society (BV)	No
• Det Norske Veritas (DNV)	Yes
• Lloyds Register of Shipping (LRS)	No
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	789.2 kg
• during manufacturing	28.7 kg
• during operation	759.8 kg
• after end of life	0.24 kg

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Technical specifications (continued)

Article number	6EP3446-8SB10-0AY0
product brand name	SITOP
type of current supply	36 V/13 A
ambient conditions	
ambient temperature	
• during operation	-25 ... +70 °C; with natural convection
• during transport	-40 ... +85 °C
• during storage	-40 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation
connection method	
type of electrical connection	screw terminal
• at input	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm² single-core/finely stranded
• at output	+, -: 2 screw terminals each for 0.2 ... 4 mm²
• for auxiliary contacts	13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm²; 15, 16 (Remote): 1 screw terminal each for 0.14 ... 1.5 mm²
mechanical data	
width × height × depth of the enclosure	70 mm × 125 mm × 125 mm
installation width × mounting height	70 mm × 225 mm
required spacing	
• top	50 mm
• bottom	50 mm
• left	0 mm
• right	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15
• DIN-rail mounting	Yes
• S7 rail mounting	No
• wall mounting	No
housing can be lined up	Yes
net weight	1.2 kg
accessories	
mechanical accessories	Device identification label 20 mm × 7 mm, TI-grey 3RT2900-1SB20
further information internet links	
internet link	
• to website: Industry Mall	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop
• to website: CAx-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com
identification link	Yes; acc. to IEC 61406-1:2022
additional information	
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Overview



SIDOOR Software Kit

The scope of delivery of the SIDOOR Software Kit includes an installation CD.
The CD includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

Note:
Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

Selection and ordering data

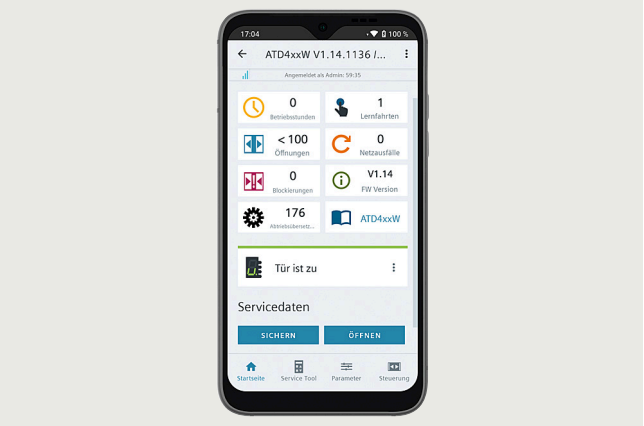
SIDOOR Software Kit	**6FB1105-0AT01-6SW0**

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Overview



SIDOOR LINK



SIDOOR SUPPORT App

A Bluetooth LE 5.0 connection can be established via the SIDOOR LINK to a smartphone or tablet with the SIDOOR SUPPORT app installed.

The SIDOOR SUPPORT app enables easy commissioning and maintenance of a door system with a SIDOOR controller, is suitable for smartphones or tablets as of Android version 9 and is available from the Google Play store.

The SIDOOR LINK is connected to the SIDOOR controller via the respective cable.

You do not need to open the cover of the controller to do this.

Note:
If the SIDOOR SUPPORT (app) is in the "Quick adjustment" or "Total adjustment" menu, the drive commands of the controller are blocked via the command inputs.

Selection and ordering data

SIDOOR LINK, SIDOOR Service adapter For commissioning and maintaining the SIDOOR controllers via SIDOOR SUPPORT (app)	**6FB1305-0AT00-0AS4**

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Overview

The SIDOOR geared motor is a combination of a gear unit, motor and incremental encoder matched to the complete system.
It is easy to connect to the controller via the interface provided, and is automatically detected during commissioning.

The maintenance-free, variable speed drive unit comprises a DC motor with non-self-locking gearing. All geared motors are available with the output shaft on the left or right. The view is toward the front of the gear unit.

The "mass to be moved" has to be taken into account when selecting the geared motor:

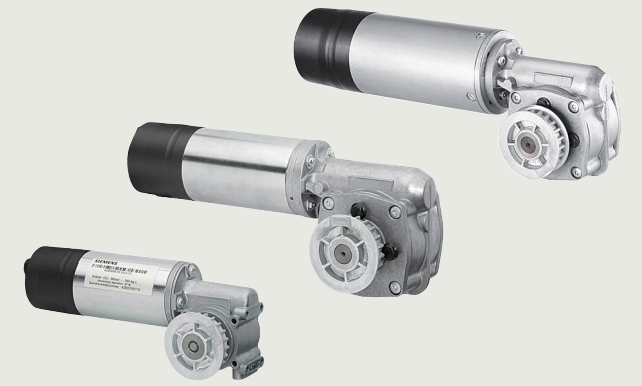
The weight to be moved is calculated from the sum of the mass equivalent of the moment of inertia of the motor rotor, the moved door weight and the moved door mechanism weight. The weight of the door to be moved and the moved weight of the door mechanism depend on the application. You can find additional information in the system manual.

The **output shaft** is appropriately prepared for the mechanical coupling of the door.

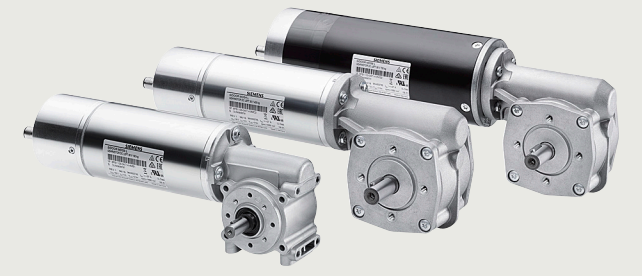
- SIDOOR M3, M4 and M5 Basic motors: Output gear with 56 mm effective diameter for the use of a S8M toothed belt (see Accessories).
- Advanced motors: Gearbox output shaft with groove and feather key A 5x5 according to DIN 6885; the output gear design and effective diameter can be freely configured between 28 mm and 122 mm. Advanced motors are recommended, among other things, for a mechanical coupling to the door via gear rack or chain.

Advanced motors:	
SIDOOR MDG3 L	6FB1103-0AT14-4MB1
SIDOOR MDG3 R	6FB1103-0AT13-4MB1
SIDOOR MDG4 L	6FB1103-0AT14-3MC2
SIDOOR MDG4 R	6FB1103-0AT13-3MC2
SIDOOR MDG5 L	6FB1103-0AT14-3MG2
SIDOOR MDG5 R	6FB1103-0AT13-3MG2

Version	Advanced motors			Basic motors		
SIDOOR designation	MDG3	MDG4	MDG5	M3	M4	M5
Maximum mass to be moved	180 kg	400 kg	700 kg	180 kg	400 kg	600 kg
Connection to door controller	via SIDOOR MDG CABLE (see Accessories)			Connecting cable permanently integrated with the geared motor, cable length 1.5 m		
Degree of protection	IP56			IP40		IP54
Design of output shaft	Gearbox output shaft with groove and feather key, optional output gear for S8M toothed belt available (see Accessories)			Fixed, pressed-on output gear for S8M toothed belt (see Accessories)		



SIDOOR M3 L to SIDOOR M5 L geared motors for automatic door control



SIDOOR MDG3 L, MDG4 L and MDG5 L

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Selection and ordering data

SIDOOR M3 geared motors	
M3 L	**6FB1103-0AT10-4MB0**
M3 R	**6FB1103-0AT11-4MB0**
SIDOOR M4 geared motors	
M4 L	**6FB1103-0AT10-3MC0**
M4 R	**6FB1103-0AT11-3MC0**
SIDOOR M5 geared motors	
M5 L	**6FB1103-0AT10-3MD0**
M5 R	**6FB1103-0AT11-3MD0**
SIDOOR MDG3 geared motors	
MDG3 L	**6FB1103-0AT14-4MB1**
MDG3 R	**6FB1103-0AT13-4MB1**
SIDOOR MDG4 geared motor	
MDG4 L	**6FB1103-0AT14-3MC2**
MDG4 R	**6FB1103-0AT13-3MC2**
SIDOOR MDG5 geared motor	
MDG5 L	**6FB1103-0AT14-3MG2**
MDG5 R	**6FB1103-0AT13-3MG2**

Accessories

The following accessories are available for the geared motors:

- Rubber-metal anti-vibration mount for low-noise door operation
  - 6FB1104-0AT02-0AD0 for SIDOOR MDG180 and SIDOOR M3 geared motors (door weights up to 180 kg).
  - 6FB1104-0AT01-0AD0 for SIDOOR MDG400, SIDOOR MDG400 NMS, SIDOOR MDG700 NMS, as well as SIDOOR M4 and M5 geared motors (door weights greater than 180 kg).
- Mounting bracket 6FB1104-0AT01-0AS0 for the geared motor mount for flexible accommodation of the rubber-bonded metal.
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit
- MDG cable for connecting MDG motors to the door controller
  - SIDOOR CABLE MDG in cable lengths 0.5 m/1.5 m/5.0 m/7.0 m/10 m/15 m/20 m for the SIDOOR MDG180, MDG400, MDG400 NMS motors.
  - SIDOOR CABLE MDGin cable lengths 5 m/10 m/15 m/20 m for the SIDOOR MDG3, MDG4 and MDG5 motors as well as the SIDOOR MDG700 NM motor.
- MDG-PULLEY belt pulley for DC geared motor and S8M toothed belt, effective diameter 56 mm.

See "Accessories".

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Technical specifications

Article number	6FB1103-0AT10-4-MB0	6FB1103-0AT11-4-MB0	6FB1103-0AT10-3-MC0	6FB1103-0AT11-3-MC0	6FB1103-0AT10-3-MD0	6FB1103-0AT11-3-MD0
	SIDOOR M3 L	SIDOOR M3 R	SIDOOR M4 L	SIDOOR M4 R	SIDOOR M5 L	SIDOOR M5 R
Supply voltage						
Rated value (DC)	30 V					
Input current						
Operational current (rated value)	4 A				7.5 A	
Power						
Active power input	120 W				225 W	
Mechanical data						
Torque of the rotary operating mechanism (rated value)	3 N·m				6.8 N·m	
Speed, max.	0.65 m/s		0.75 m/s		0.5 m/s	
Gear ratio	15					
Number of pulses per revolution, max.	100					
Weight of door, max.	180 kg		400 kg		600 kg	
Standards, approvals, certificates						
CE mark	Yes					
UL approval	Yes					
EAC (formerly Gost-R)	Yes					
TÜV Inspectorate approval	Yes					
China RoHS compliance	Yes					
Ambient conditions						
Ambient temperature during operation						
• min.	-20 °C					
• max.	50 °C					
Ambient temperature during storage/transportation						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					
Dimensions						
Height of motor	98 mm		115 mm		124 mm	
Length of motor	236 mm		275 mm		344 mm	
Diameter of motor	63 mm				80 mm	
Width of gear unit, including drive pinion	85 mm		105 mm		111 mm	

Article number	6FB1103-0AT14-4-MB1	6FB1103-0AT13-4-MB1	6FB1103-0AT14-3-MC2	6FB1103-0AT13-3-MC2	6FB1103-0AT14-3-MG2	6FB1103-0AT13-3-MG2
	SIDOOR MDG3 L	SIDOOR MDG3 R	SIDOOR MDG4 L	SIDOOR MDG4 R	SIDOOR MDG5 L	SIDOOR MDG5 R
General information						
Product type designation	MDG3 L	MDG3 R	MDG4 L	MDG4 R	MDG5 L	MDG5 R
Supply voltage						
Rated value (DC)	30 V					
Input current						
Operational current (rated value)	4 A				7.5 A	
Power						
Active power input	120 W				225 W	

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Technical specifications (continued)

Article number	6FB1103-0AT14-4-MB1	6FB1103-0AT13-4-MB1	6FB1103-0AT14-3-MC2	6FB1103-0AT13-3-MC2	6FB1103-0AT14-3-MG2	6FB1103-0AT13-3-MG2
	SIDOOR MDG3 L	SIDOOR MDG3 R	SIDOOR MDG4 L	SIDOOR MDG4 R	SIDOOR MDG5 L	SIDOOR MDG5 R
Mechanical data						
Torque of the rotary operating mechanism (rated value)	3 N·m				6 N·m	
Speed, max.	0.65 m/s		0.75 m/s		0.5 m/s	
Mass to be moved, max.	180 kg		400 kg		700 kg	
Gear unit	Yes					
Gear ratio	15					
Number of pulses per revolution, max.	100					
Fixed output gear	No					
Standards, approvals, certificates						
CE mark	Yes					
UL approval	Yes					
EAC (formerly Gost-R)	Yes					
China RoHS compliance	Yes					
Ambient conditions						
Ambient temperature during operation						
• min.	-20 °C					
• max.	50 °C					
Ambient temperature during storage/transportation						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					
Cables						
Fixed connecting cable	No					
Dimensions						
Diameter of output gear, min.	28 mm					
Diameter of output gear, max.	122 mm					
Height of motor	98 mm		115 mm		124 mm	
Length of motor	264 mm		303 mm		348 mm	
Diameter of motor	63 mm				80 mm	
Width of gearbox	85 mm		106 mm		109 mm	

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Overview

An extensive range of accessories is available for the door control drives.

This is necessary to ensure low-noise operation of the door leaves by the motor. The geared motors can be optimally integrated into the respective door drive system.

Accessories for all controllers for industrial applications

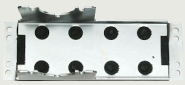
Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR M3 and SIDOOR MDG3 geared motors
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for SIDOOR M4 and MDG4 as well as SIDOOR M5 and MDG5 geared motors



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for geared motors with masses to be moved of up to 180 kg

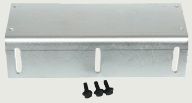


Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for geared motors with masses of up to 700 kg

Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for mounting SIDOOR geared motors, for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit. For setting the toothed belt to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

mounting rail holder

The standard mounting rail holder 6FB1144-0AT00-3SA0 is available for mounting controllers on the TH 35 standard mounting rail according to IEC 60715.

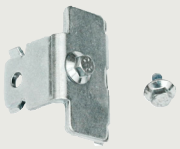
Door clutch holder

The door clutch holder serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

A door clutch holder is available for each toothed belt width:

Overview (continued)

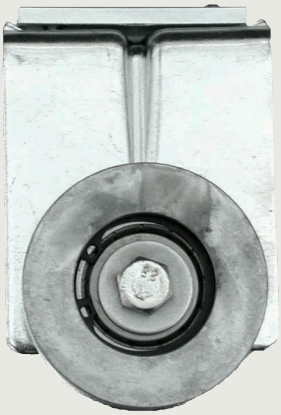
- Width 12 mm: 6FB1104-0AT01-0CP0
- Width 14 mm: 6FB1104-0AT02-0CP0



Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system. The STS toothed belt is redirected via this deflector unit.



Deflector unit 6FB1104-0AT03-0AS0

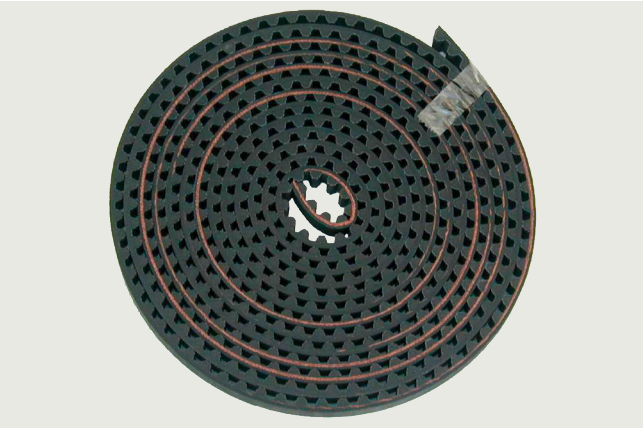
STS toothed belt

The door system is moved between the end positions of the door using the STS toothed belts. Two different toothed belt lengths can be ordered for each toothed belt width.

- Toothed belt width 12 mm:
  - Length 4 m: 6FB1104-0AT01-0AB0
  - Length 45 m: 6FB1104-0AT02-0AB0
- Toothed belt width 14 mm:
  - Length 4 m: 6FB1104-0AT03-0AB0
  - Length 55 m: 6FB1104-0AT04-0AB0

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Overview (continued)



Toothed belt 6FB1104-0AT01-0AB0 (width 12 mm, length 4 m)

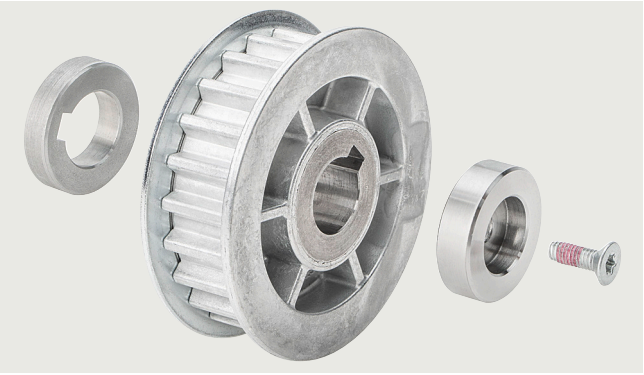


Toothed belt 6FB1104-0AT02-0AB0 (width 12 mm, length 45 m)

MDG-PULLEY belt pulley

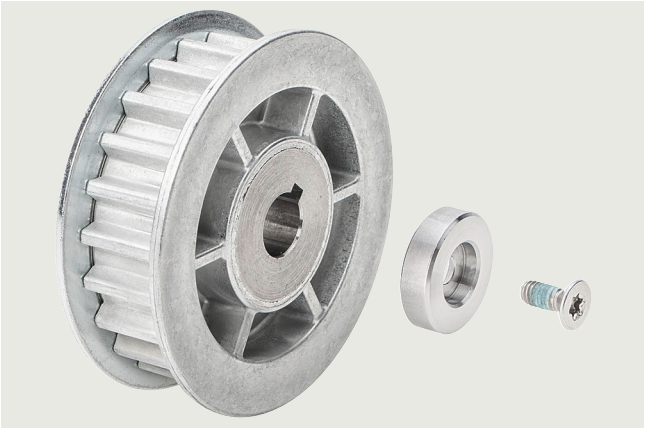
This belt pulley is used for DC geared motors with the S8M toothed belt with an effective diameter of 56 mm.

- for SIDOOR MDG4, MDG5 DC geared motors: 6FB1104-0AT14-0AS1
- for SIDOOR MDG3 DC geared motors: 6FB1104-0AT10-0AS1



SIDOOR MDG-PULLEY 14-S8M-56, 6FB1104-0AT14-0AS1

Overview (continued)



SIDOOR MDG-PULLEY 10-S8M-56, 6FB1104-0AT10-0AS1

Accessories for machine tool door drives only

SIDOOR MDG-CABLE cable set

This cable set connects the ATD4xxW door controller to the SIDOOR MDG3, MDG 4 and MDG 5 geared motors. Various lengths are available.

- Length 5 m: 6FB1104-0AT05-0CB2
- Length 10 m: 6FB1104-0AT10-0CB2
- Length 15 m: 6FB1104-0AT15-0CB2
- Length 20 m: 6FB1104-0AT20-0CB2

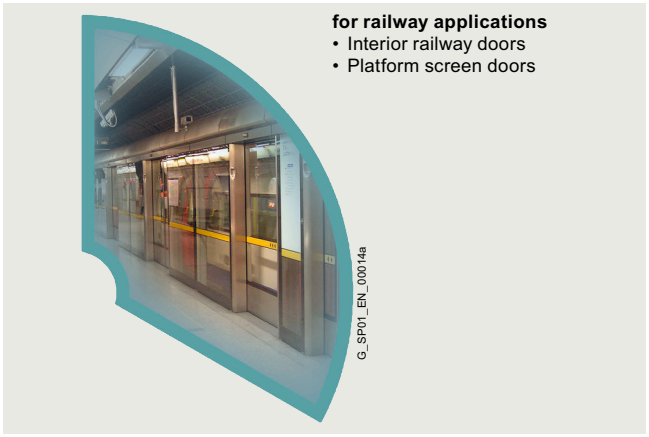
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Selection and ordering data

Rubber-metal anti-vibration mounts for geared motors	
• SIDOOR rubber-metal anti-vibration mount for geared motors with masses of up to 180 kg	**6FB1104-0AT02-0AD0**
• SIDOOR rubber-metal anti-vibration mount for geared motors with masses of up to 700 kg	**6FB1104-0AT01-0AD0**
Mounting bracket	
• SIDOOR mounting bracket for geared motor	**6FB1104-0AT01-0AS0**
• SIDOOR mounting bracket with tensioning device for deflector pulley	**6FB1104-0AT02-0AS0**
DIN rail holder	
For mounting controllers on the standard DIN rail TH 35	**6FB1144-0AT00-3AS0**
SIDOOR door clutch holder	
• For toothed belt width of 12 mm	**6FB1104-0AT01-0CP0**
SIDOOR deflector unit	**6FB1104-0AT03-0AS0**
SIDOOR STS toothed belt	
Width 12 mm	
• 4 m	**6FB1104-0AT01-0AB0**
• 45 m	**6FB1104-0AT02-0AB0**
SIDOOR STS toothed belt	
Width 14 mm	
• 4 m	**6FB1104-0AT03-0AB0**
• 55 m	**6FB1104-0AT04-0AB0**
For industrial applications only	
SIDOOR MDG-CABLE cable set	
• 5 m	**6FB1104-0AT05-0CB2**
• 10 m	**6FB1104-0AT10-0CB2**
• 15 m	**6FB1104-0AT15-0CB2**
• 20 m	**6FB1104-0AT20-0CB2**
SIDOOR door clutch holder	
• For toothed belt, width 14 mm	**6FB1104-0AT02-0CP0**
SIDOOR MDG-PULLEY	
• SIDOOR MDG-PULLEY 14-S8M-56 belt pulley for MDG4 and MDG5 DC geared motors and S8M toothed belt, effective diameter 56 mm	**6FB1104-0AT14-0AS1**
• SIDOOR MDG-PULLEY 10-S8M-56, belt pulley for MDG3 DC geared motor and S8M toothed belt, effective diameter 56 mm	**6FB1104-0AT10-0AS1**

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Overview



Automatic Door Control Systems for Railway Applications

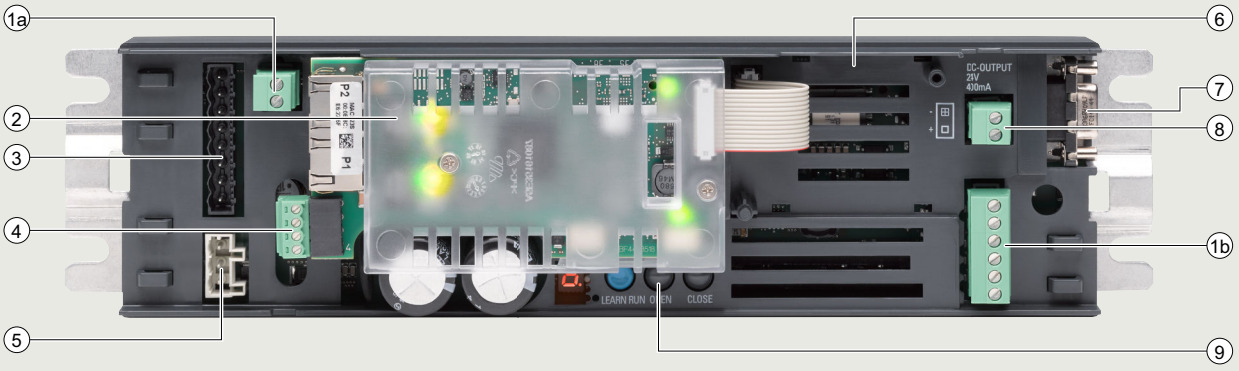
The product-specific application/requirement lies in complying with the special railway requirements concerning functional safety.

Interior railway doors have a closing spring which must always bring the door into the "CLOSED" position. This applies to either side, even when a train car is inclined at 10°.

These specific operating states are handled by the door controller.

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Overview



1a 1b Input signal connection
2 PROFINET module (2PN incl. status LEDs
3 SIDOOR EC direct drive connection
4 Power supply connection (SIDOOR TRANSFORMER or SITOP)
5 Output signal connection
6 Fan (only for SIDOOR ARE531S)
7 Software Kit connection
8 24 V DC / 400 mA output
9 Status display and service button

G_SP01_EN_00071a

SIDOOR ATE530S/531S wiring diagram

The SIDOOR ATE53xS door controller is an "intelligent" door drive which can be used for safety-oriented operation of platform screen doors (PSD) according to individual requirements.
Siemens has once again shown just how easy integration can be with the innovative SIDOOR ATE53xS platform screen door drive in conjunction with SIDOOR MED280 or MEG251 motors.
The PROFINET module integrated in the SIDOOR ATE53xS enables standardized, certified connection to PROFINET IO systems.

- Use of standard automation components
- Full integration into TIA Portal and STEP 7 thanks to PROFINET connection
- Parameter assignment and monitoring of door control parameters via the PROFINET interface (function blocks available as example applications in SIOS).
- Application example:
  Synchronization of two-panel and independent platform screen doors with SIDOOR ATE530S PROFINET EC door drive and S7-1500 CPU via TIA Portal
- Application example:
  Safety-oriented automation of platform screen doors with SIDOOR ATE530S PROFINET EC door drive and S7-1500 CPU via TIA Portal
- Read-in of two safe signals (two-channel, antivalent)
- High level of system safety thanks to safe torque off (e.g. self-release in the event of a fault)
- Firmware update for all SIDOOR controllers on an entire platform possible centrally via TCP/IP
- SIL 2 according to IEC 62061

Selection and ordering data

SIDOOR ATE530S Platform screen door drive	
SIDOOR ATE530S coated, version with protective coating	**6FB1231-3BM12-7AT0**
SIDOOR ATE531S Platform screen door drive	
SIDOOR ATE531S, version with protective coating and extended temperature range	**6FB1231-3BM11-7AT0**

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Technical specifications

Article number	6FB1231-3BM12-7AT0 SIDOOR ATE530S COATED	6FB1231-3BM11-7AT0 SIDOOR ATE531S
General information		
Product type designation		ATE531S
Mean time between failures (MTBF)	13 y	
Installation type/mounting		
Installation and mounting instructions	No direct exposure to the sun	
Supply voltage		
Design of the power supply	Via SIDOOR TRANSFORMER or via DC	
Rated value (DC)	36 V; with MED280: at 24 V DC max. door speed of 500 mm/s, at 28.8 V DC max. door speed of 800 mm/s. With MEG251: at 24 V DC max. door speed of 500 mm/s, at 28.8 V DC max. door speed of 750 mm/s	
Encoder supply		
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!	
short-circuit proof	Yes	
Overload-proof	Yes	
24 V encoder supply		
• Output current, max.	400 mA	
Power		
Active power input	80 W	
Active power input, max.	540 W	
Active power input (standby mode)	7 W	
Digital inputs		
Control inputs isolated	Yes	
Control inputs p-switching	Yes	
Input voltage		
• for signal "0", min.	-3 V	
• for signal "0", max.	5 V	
• for signal "1", min.	10 V	
• for signal "1", max.	28 V	
Input current		
• for signal "1", min.	3 mA	
• for signal "1", max.	15 mA	
Digital outputs		
Relay outputs		
- Switching capacity of contacts		
- at 30 V DC, min.	0.01 A	
- at 30 V DC, max.	0.5 A	
Mechanical data		
Opening width of door, min.	0.35 m	
Opening width of door, max.	5 m	
Weight of door, max.	280 kg	
Operating cycle frequency of door, max.	180 1/h	
Kinetic energy, max.	75 J	
Interfaces		
Interfaces/bus type	PROFINET according to Conformance Class A, B, C; integrated switch for linear and ring structure	
Standards, approvals, certificates		
CE mark	Yes	No
UL approval	No	
China RoHS compliance	Yes	
Standard for safety	EN 61010-1 / EN 61010-2-201 / EN 14752 / EN ISO 13849-1 Cat. 2 PL d / IEC 62061: SIL 2	

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Technical specifications (continued)

Article number	6FB1231-3BM12-7AT0 SIDOOR ATE530S COATED	6FB1231-3BM11-7AT0 SIDOOR ATE531S
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	
• max.	50 °C	70 °C
• Remark	Screw control device thermally conductive onto a metallic mounting surface or standard rail mounting, otherwise the maximum operating temperature is only 40 °C	to ensure compliance with MTBF value, ensure that the ambient temperature is less than 50 °C for 90 % of operating time and screw the control unit onto a metallic mounting surface in a manner that ensures thermal conductivity or use standard rail mounting. At operating temperatures above 50 °C, the maximum output current of the 24 V DC output is a maximum of 0.1 A and the maximum number of cycles is 60/h
Ambient temperature during storage/transportation		
• Storage, min.	-40 °C	
• Storage, max.	85 °C	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
Dimensions		
Width	320 mm	
Height	60 mm	
Depth	80 mm	

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Overview



(1a) (1b) 24 V digital input, isolated
(2) Motor connection
(3) Power supply input, 36 V DC
(4) Digital output (relay)
(5) Serial service interface, Software Kit connection
(6) 24 V DC/0.4 A output, for external components

SIDOOR ATE530G

The SIDOOR ATE530G drive control is designed for controlling gap fillers between external train doors and the platform edge. The gap filler facilitates easy access for passengers. The innovative SIDOOR ATE530G drive solution enables operation of a gap filler with adjustable speed, acceleration and motor currents.
A project-specific motor is used depending on the application.
The SIDOOR ATE530G controller is activated by digital signals from a higher-level door control, and reports information about its current state via digital signals back to the door control.
The following drive functions are supported:

- System start-up after power failure
- "Extend", "Retract" command
- Gap filler is moved by a travel curve profile
- Obstruction detection
- Ice-breaker function
  Icing can be shifted broken by repeated extension and retraction of the gap filler with increased force.
- Reversing at the platform edge

The SIDOOR ATE530G controller fulfills Basic Integrity in accordance with EN 50657:2017

Selection and ordering data

SIDOOR ATE530G control device for gap fillers SIDOOR ATE530G coated, For controlling gap fillers between external train doors and the platform edge.	**6FB1221-5SM10-7BP0**

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Technical specifications

Article number	6FB1221-5SM10-7BP0 SIDOOR ATE530G COATED
General information	
Product type designation	ATE530G COATED
Mean time between failures (MTBF)	13 y
Installation type/mounting	
Installation and mounting instructions	No direct exposure to the sun
Supply voltage	
Design of the power supply	Via SIDOOR TRANSFORMER or via DC
Rated value (DC)	36 V
Encoder supply	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
24 V encoder supply	
• Output current, max.	400 mA
Power	
Active power input	80 W
Active power input, max.	540 W
Active power input (standby mode)	7 W
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Input voltage	
• for signal "0", min.	-3 V
• for signal "0", max.	5 V
• for signal "1", min.	10 V
• for signal "1", max.	28 V
Input current	
• for signal "1", min.	3 mA
• for signal "1", max.	15 mA
Digital outputs	
Relay outputs	
- Switching capacity of contacts	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	0.5 A
Standards, approvals, certificates	
CE mark	Yes
EAC (formerly Gost-R)	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	50 °C
• Remark	Screw control device thermally conductive onto a metallic mounting surface or standard rail mounting, otherwise the maximum operating temperature is only 40 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	85 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %

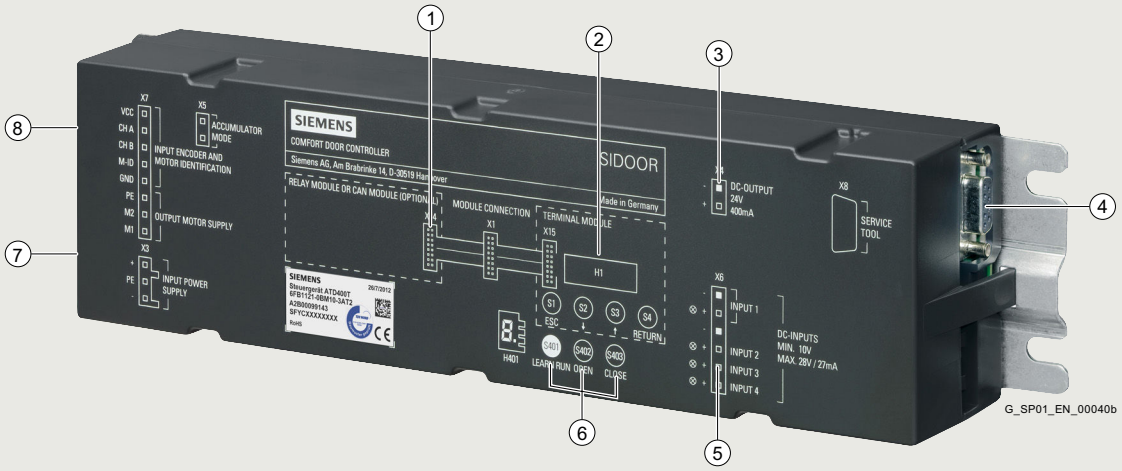
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Technical specifications (continued)

Article number	6FB1221-5SM10-7BP0 SIDOOR ATE530G COATED
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

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Overview



1 RELAY module connection
2 Terminal module
3 Connection for 24 V DC/400 mA output voltage
4 Software Kit connection
5 Input signal connection
6 Control panel
7 Connection for 16.8 V to 36 V DC input voltage
8 Motor connection

SIDOOR ATD400T interior railway door drive

The SIDOOR ATD400T interior railway door drive is an "intelligent" door drive which enables interior and gangway doors to be opened and closed at adjustable speeds and accelerations.

- Relay module design
- For dynamic door weights up to 180 kg
- Automatic door weight detection
- Operating temperature -20 to +70 °C [1)]
- Flexible motor management (two different motor types), automatic detection
- Opening width 0.25 to 4 m
- Door can be operated with and without closing springs (60 to 80 N)
- With two identical door leaves, can be used up to a train inclination of 0 to 10%
- Forces and energies are limited in accordance with EN 14752
- EMC according to EN 50121-3-2
- Fulfills HL3 according to fire protection standard EN 45545-2 (Railway applications – Fire protection on rail vehicles)
- Vandal-proof

1) Note:

- Maximum output current at 24 V DC:
  - 0.4 A at ≤ 55 °C ambient temperature during operation
  - 0.1 A from 55 °C to 70 °C ambient temperature during operation, with restrictions at operating temperatures > 55 °C
- Maximum ambient temperature during operation:
  - 55 °C
  - 70 °C with restrictions at operating temperatures > 55 °C
- Restrictions at operating temperatures > 55 °C:
  - Use the 24 V output voltage only for operating the control inputs (max. 0.1 A)
  - Use a sufficiently large (at least 350 x 350 mm), unpainted metal mounting plate
  - The maximum drive parameters are restricted to the default values
  - If temperature class T3 according to EN 50155 is used, the maximum air temperature of 85 °C must not be exceeded near the printed-circuit board

Selection and ordering data

SIDOOR ATD400T Control device for interior railway doors, relay module design	**6FB1121-0BM13-3AT2**

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Technical specifications

Article number	6FB1121-0BM13-3AT2 SIDOOR ATD400T RELAY
General information	
Product type designation	ATD400T relay
Installation type/mounting	
Installation and mounting instructions	At operating temperatures > 55 °C a sufficiently large (at least 350 mm x 350 mm), unpainted, metal mounting plate must be used
Supply voltage	
Design of the power supply	DC
Rated value (DC)	24 V
Input current	
Current consumption, max.	15 A
Encoder supply	
Output voltage (DC)	24 V; Ensure correct polarity! CAUTION: Do not supply with external voltage!
short-circuit proof	Yes
Overload-proof	Yes
24 V encoder supply	
• Output current, max.	400 mA
• output current at 55 °C to 70 °C, max.	100 mA
Power	
Active power input	80 W
Active power input, max.	540 W
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Input voltage	
• for signal "0", min.	-3 V
• for signal "0", max.	5 V
• for signal "1", min.	10 V
• for signal "1", max.	28 V
Input current	
• for signal "1", min.	9 mA
• for signal "1", max.	27 mA
Digital outputs	
Relay outputs	
- Switching capacity of contacts	
- at 50 V DC, min.	0.01 A; 50 V DC switching voltage not released for NFPA-relevant countries
- at 50 V DC, max.	1 A; 50 V DC switching voltage not released for NFPA-relevant countries
- at 230 V AC, min.	0.01 A
- at 230 V AC, max.	1 A
Mechanical data	
Opening width of door, min.	0.25 m
Opening width of door, max.	4 m
Weight of door, max.	180 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	80 N
Counterweight	
• with SIDOOR M3 geared motor, max.	6 kg
Interfaces	
Interfaces/bus type	without
Standards, approvals, certificates	
CE mark	Yes
UL approval	No
China RoHS compliance	Yes

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Technical specifications (continued)

Article number	6FB1121-0BM13-3AT2 SIDOOR ATD400T RELAY
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	70 °C; At operating temperatures > 55 °C the operating parameters are limited to default values
• Remark	At operating temperatures > 55 °C, the maximum air temperature of 85 °C must not be exceeded near the printed-circuit board if temperature class T3 according to EN 50155 is used
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Fire resistance	
• Behavior in fire	complies with EN 45545-2 Hazard Level HL3
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

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Overview



SIDOOR Software Kit

The scope of delivery of the SIDOOR Software Kit includes an installation CD.

The CD includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

Note:

Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

Selection and ordering data

SIDOOR Software Kit	**6FB1105-0AT01-6SW0**

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Overview

SIDOOR motors are speed controlled, taking set force and speed limits into account. The gear outlet direction is defined as left or right when viewing the gear unit from the front. The power is transmitted by a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with 2 door clutch holders. This enables it to drive both one-sided and centrally-opening doors.

SIDOOR geared motors are available in two technological versions.

- 1. DC technology in version (area of application: interior railway doors)
  - DC geared motor
    SIDOOR geared motors are a combination of gear unit, motor, and encoder. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. The variable speed drive unit comprises a speed-controlled DC motor with non-self-locking gearing.
- 2. EC technology in version (area of application: platform screen doors)
  - EC direct drive
    SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor. The EC direct drive can be fitted in various mounting orientations, facilitating reduced inventory management and minimizing assets.
  - EC geared motors
    EC geared motors are electronically commutated DC motors with non-self-locking gearing and are speed-controlled.
    They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. Due to the brushless drive technology, EC geared motors are subject to less abrasion compared with DC geared motors and thus have a longer service life. On account of the brushless drive technology, no commutation noises come from this motor, so it generates less noise than the DC geared motors.

Motors for interior railway door drives

The following **DC geared motors** are available for interior railway door drives. They should be selected according to the dynamic door weight.

- SIDOOR MDG180 geared motors, compliance with fire protection standard EN 45545-2 (max. door weight 180 kg)
  - SIDOOR MDG180 L EN 45545-2 (pinion left) 6FB1103-0AT16-4MB0
  - SIDOOR MDG180 R EN 45545-2 (pinion right) 6FB1103-0AT15-4MB0
- SIDOOR M3 geared motors (max. door weight 180 kg)
  - SIDOOR M3 L (pinion left) 6FB1103-0AT10-4MB0
  - SIDOOR M3 R (pinion right) 6FB1103-0AT11-4MB0

Motors for platform screen door drives
EC technology:

- SIDOOR MEG251 geared motors (max. door weight 250 kg)
  - SIDOOR MEG251 L (pinion left), 6FB1203-5AT00-7MP0
  - SIDOOR MEG251 R (pinion right), 6FB1203-5AT01-7MP0

Overview (continued)



Photo: DC geared motor SIDOOR M3 L, 6FB1103-0AT10-4MB0 or SIDOOR MDG180 L, 6FB1103-0AT16-4MB0. (version with pinion left)



Photo: EC geared motor SIDOOR MEG251 R, 6FB1203-5AT01-7MP0. (version with pinion right)

Selection and ordering data

Motors for interior railway door drives	
SIDOOR MDG180 geared motors	
MDG180 L, EN 45545-2	**6FB1103-0AT16-4MB0**
MDG180 R, EN 45545-2	**6FB1103-0AT15-4MB0**
SIDOOR M3 geared motors	
M3 L	**6FB1103-0AT10-4MB0**
M3 R	**6FB1103-0AT11-4MB0**
Motors for platform screen doors	
SIDOOR MEG251 EC technology geared motor	
MEG251 L	**6FB1203-5AT00-7MP0**
MEG251 R	**6FB1203-5AT01-7MP0**

Accessories

The following accessories are available for the SIDOOR MDG180 EN 45545-2 geared motors and SIDOOR MEG251 EC geared motors:

- Rubber-metal anti-vibration mount for low-noise door operation, 6FB1104-0AT02-0AD0
- Mounting bracket for the geared motor mount for flexible accommodation of the rubber-bonded metal 6FB1104-0AT01-0AS0

See "Accessories".

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Technical specifications

Article number	6FB1103-0AT16-4-MB0 SIDOOR MDG180 L DIN EN 45545-2	6FB1103-0AT15-4-MB0 SIDOOR MDG180 R DIN EN 45545-2	6FB1103-0AT10-4-MB0 SIDOOR M3 L	6FB1103-0AT11-4-MB0 SIDOOR M3 R	6FB1203-5AT00-7-MP0 SIDOOR MEG251 L	6FB1203-5AT01-7-MP0 SIDOOR MEG251 R
Supply voltage						
Rated value (DC)	30 V				24 V	
Input current						
Operational current (rated value)	4 A				6.8 A	
Power						
Active power input	120 W				163 W	
Mechanical data						
Torque of the rotary operating mechanism (rated value)	3 N·m				4.1 N·m	
Speed, max.	0.65 m/s				0.75 m/s	
Gear ratio	15					
Number of pulses per revolution, max.	100					
Weight of door, max.	180 kg				250 kg	
Breakaway force, max.					50 N	
Standards, approvals, certificates						
CE mark	Yes					
UL approval	No		Yes		No	
EAC (formerly Gost-R)	Yes					
TÜV Inspectorate approval			Yes			
China RoHS compliance	Yes					
Ambient conditions						
Ambient temperature during operation						
• min.	-20 °C					
• max.	50 °C				70 °C	
Ambient temperature during storage/transportation						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					
Fire resistance						
• Behavior in fire	complies with EN 45545-2 Hazard Level HL3					
Dimensions						
Height of motor	98 mm				100 mm	
Length of motor	236 mm				249 mm	
Diameter of motor	63 mm				62 mm	
Width of gear unit, including drive pinion	85 mm				86 mm	

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Overview



SIDOOR MED280 direct drive

SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor with non-self-locking gearing.

Direct drives are designed for certain masses and can control both drive directions.

- SIDOOR MED280 direct drive for max. 280 kg (6FB1203-0AT12-7DA0)

Selection and ordering data

SIDOOR MED280 direct drive Motor for door control, for max. dynamic door weights of 280 kg	**6FB1203-0AT12-7DA0**

Accessories

The following accessories are available for the SIDOOR MED280 direct drives:

- Motor holder for flexible integration in the door system. Choice of cable outlets.
  - SIDOOR motor holder 6FB1104-0AT03-0AD0
  - Mounting bracket 6FB1104-0AT01-0AS0 for direct drives for flexible accommodation of the motor holder

See "Accessories".

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Technical specifications

Article number	6FB1203-0AT12-7DA0 SIDOOR MED280
Supply voltage	
Rated value (DC)	24 V
Input current	
Operational current (rated value)	9.7 A
Power	
Active power input	233 W
Mechanical data	
Torque of the rotary operating mechanism (rated value)	4.7 N·m
Speed, max.	0.8 m/s
Number of pulses per revolution, max.	1 024
Weight of door, max.	280 kg
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	70 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	85 °C
Dimensions	
Width of motor	160 mm
Height of motor	140 mm
Length of motor	56 mm
• including drive pinion	91 mm

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Overview

A comprehensive range of accessories is available for the SIDOOR systems. This is necessary to ensure low-noise operation of the door leaves by the controller.

Accessories for SIDOOR DC and EC geared motors

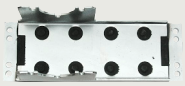
Rubber-metal anti-vibration mount

To ensure low-noise door operation, the SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR M3 and SIDOOR MDG180 DC geared motors (also for EN 45545-2) and SIDOOR MEG251 EC geared motors (door weights up to 250 kg)
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for SIDOOR M4 DC geared motors (door weights up to 400 kg)



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0

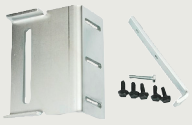
Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for SIDOOR M3 and SIDOOR MDG180 DC geared motors (also for EN 45545-2) and SIDOOR MEG251 EC geared motors for flexible accommodation of the rubber-bonded metal.
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit, this enables the toothed belt to be set to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor

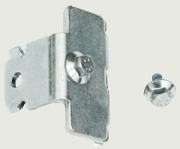


Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

Door clutch holder

The door clutch holder 6FB1104-0AT01-0CP0 serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

Overview (continued)

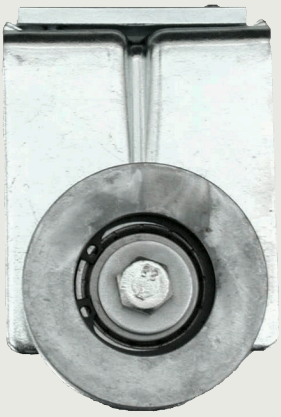


Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system.

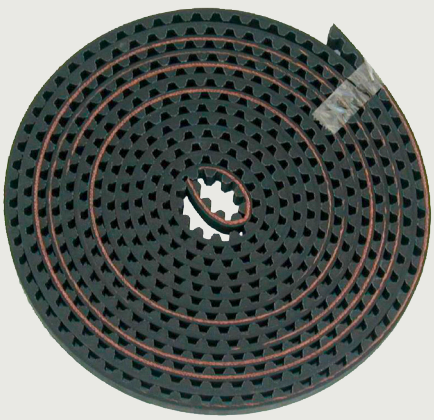
The STS toothed belt is redirected via this deflector unit.



Deflector unit 6FB1104-0AT03-0AS0

STS toothed belt

The door system is moved between the end positions of the door using the STS toothed belt 6FB1104-0AT0.-0AB0. Two different toothed belt lengths are available.



Toothed belt 6FB1104-0AT01-0AB0, length 4 m

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Overview (continued)

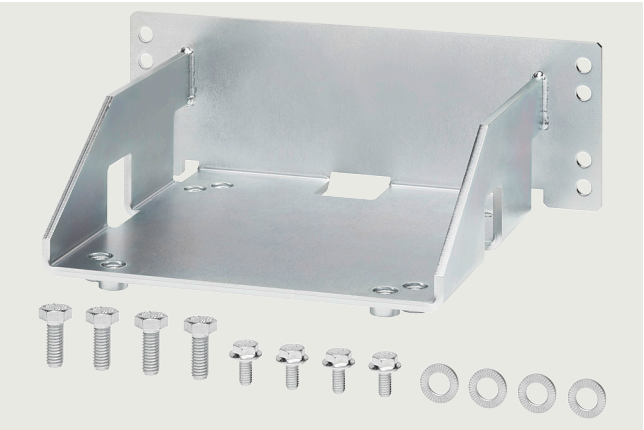


Toothed belt 6FB1104-0AT02-0AB0, length 45 m

Accessories for the SIDOOR MED280 EC direct drive, for the controller for the SIDOOR ATE530S/ATE531S platform screen door drive

Motor holder

- Motor holder 6FB1104-0AT03-0AD0 for accommodation of the SIDOOR MED280 direct drive.



SIDOOR motor holder

Mounting bracket

- For mounting the SIDOOR motor holder 6FB1104-0AT01-0AS0 Identical to the mounting bracket 6FB1104-0AT01-0AS0 for DC geared motors.



Mounting bracket for geared motor

- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (large) 6FB1104-0AT05-0AS4

Overview (continued)



SIDOOR mounting bracket, large

- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (small) 6FB1104-0AT05-0AS5



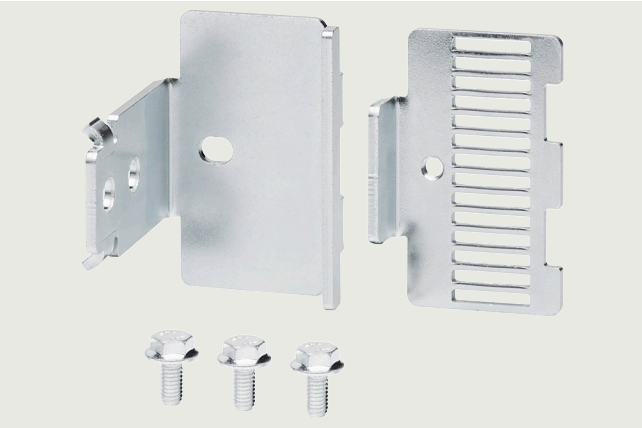
SIDOOR mounting bracket, small

Door clutch holder

- For attaching both ends of the toothed belt and connecting the respective door panel to the toothed belt, width 20 mm, 6FB1104-0AT05-0AS1

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Overview (continued)



SIDOOR door clutch holder

Deflector unit

- For attaching the SIDOOR toothed belt and fixing to the door
  6FB1104-0AT07-0AS0



SIDOOR deflector unit

STD toothed belt

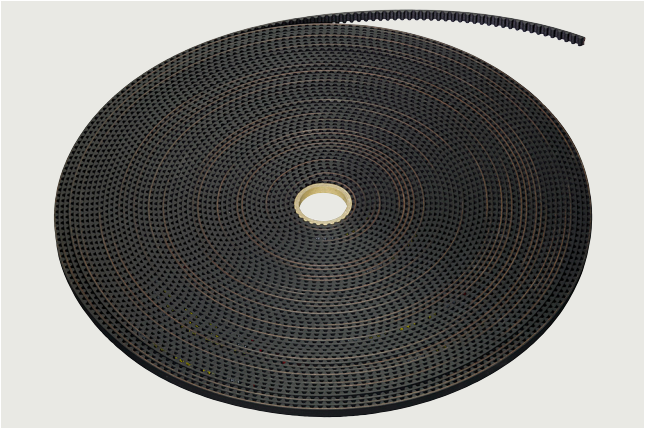
- As a connection between the door system and the end positions of the door,
  toothed belt width 20 mm. Length 4 m, 6FB1104-0AT05-0AB0

Overview (continued)



SIDOOR toothed belt, small

- Toothed belt width 20 mm. Length 45 m 6FB1104-0AT06-0AB1



SIDOOR toothed belt, large

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Selection and ordering data

Accessories for the SIDOOR MED280 EC direct drive, for the control device for the SIDOOR ATE530S/ATE531S platform screen door drive	
Motor holder for SIDOOR MED280 direct drive	**6FB1104-0AT03-0AD0**
Mounting bracket for mounting the motor holder	**6FB1104-0AT01-0AS0**
Mounting bracket with tensioning device for mounting the deflector unit	
• Large	**6FB1104-0AT05-0AS4**
• Small	**6FB1104-0AT05-0AS5**
SIDOOR door clutch holder	
• For toothed belt, width 20 mm	**6FB1104-0AT05-0AS1**
SIDOOR deflector unit	**6FB1104-0AT07-0AS0**
SIDOOR STD toothed belt Width 20 mm	
• 4 m	**6FB1104-0AT05-0AB0**
• 45 m	**6FB1104-0AT06-0AB1**
Accessories for SIDOOR DC and EC geared motors	
Rubber-metal anti-vibration mounts for geared motors	
• SIDOOR rubber-metal anti-vibration mount for geared motors for door weights up to 300 kg	**6FB1104-0AT02-0AD0**
• SIDOOR rubber-metal anti-vibration mount for geared motors for door weights from 300 kg	**6FB1104-0AT01-0AD0**
Mounting bracket	
• SIDOOR mounting bracket for geared motor	**6FB1104-0AT01-0AS0**
• SIDOOR mounting bracket with tensioning device for deflector pulley	**6FB1104-0AT02-0AS0**
SIDOOR door clutch holder	
• For toothed belt, width 12 mm	**6FB1104-0AT01-0CP0**
SIDOOR deflector unit	**6FB1104-0AT03-0AS0**
SIDOOR STS toothed belt Width 12 mm	
• 4 m	**6FB1104-0AT01-0AB0**
• 45 m	**6FB1104-0AT02-0AB0**

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14/2	**SIMATIC HMI**
14/2	SIMATIC HMI operator control and monitoring systems
14/6	**Industrial Computing**
14/6	Industrial Computing
14/7	**SIMATIC PCS 7**
14/7	SIMATIC PCS 7
14/10	**Industrial communication**
14/10	Industrial communication
14/12	**Industrial Identification and Locating**
14/12	Introduction
14/14	SIMATIC Ident

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Overview



SIMATIC HMI operator control and monitoring systems – excellent operator control and monitoring

The right solution for every visualization task – for machine manufacturers, integrators, and end users:
For greater transparency in machines – all the way to the controller and monitoring of entire plants.
SIMATIC HMI (Human Machine Interface) enables seamless industrial visualization solutions for monitoring machines and plants. It offers maximum efficiency in engineering and comprehensive control options – with brilliant displays or powerful, PC-based solutions.
Due to increasing digitalization, solutions such as SIMATIC HMI are crucial for mastering complex environments.

Advantages:

- Efficient engineering – The integration into the Totally Integrated Automation Portal (TIA Portal) permits full access to the entire digital automation – from digital planning to integrated engineering, all the way to transparent operation.
- Devices for all environments – Robust SIMATIC HMI Panels and industry PCs meet all requirements for harsh environments in a wide range of industries.
- Scalable HMI solutions – HMI solutions ranging from small machine-level solutions to plant-wide SCADA systems, which can be individually customized due to open interfaces.
- Equipped for the future – The combination of state-of-the-art technologies and powerful systems enables the implementation of increasingly complex processes and reliable fulfillment of growing requirements – while protecting your investments.

General information on SIMATIC HMI is available at this link
General information on SIMATIC SCADA systems is available at this link

SIMATIC HMI software – a lot more than just visualization software

With the SIMATIC WinCC Unified (TIA Portal), SIMATIC WinCC V8 and SIMATIC WinCC Open Architecture product families, SIMATIC HMI covers the entire engineering and visualization software spectrum for the human machine interface.

- SIMATIC WinCC Unified (TIA Portal) is the most innovative HMI system, universally applicable, from Panel to Edge to PC-based applications. The functionality covers both visualization tasks at machine level and SCADA applications on PC-based multi-user systems,

More information on WinCC Unified is available at this link

- SIMATIC WinCC V8, leading in the manufacturing industry, is the proven SCADA system for complex requirements, e.g. distributed or redundant systems and IT/OT integration.

More information on WinCC V8 is available at this link

- SIMATIC WinCC Open Architecture, leading in infrastructure applications, addresses applications with high customer-specific adaptation requirements.

More information on WinCC Open Architecture is available at this link

SIMATIC HMI – brilliant and rugged HMI devices for all applications

- SIMATIC HMI Key Panels
  Preassembled and ready for installation, for conventional operator panels.

More information on Key Panels is available at this link

- SIMATIC HMI Unified Panels
  SIMATIC HMI Unified Basic Panels are a cost-effective entry-level solution and are the new standard in the basic segment of machine visualization.
  Also available as SIPLUS variant for extreme ambient conditions.
- SIMATIC HMI Unified Comfort Panels are the high-end panels for maximum machine transparency and more flexibility in the field of application, even under special ambient conditions (PRO, Hygienic and SIPLUS).

More information on Unified Panels is available at this link

- Mobile Panels
  Portable HMI devices for mobile deployment on site.

More information on Mobile Panels is available at this link

- SIMATIC HMI Industrial Web Panels - Thanks to their capacitive glass front with multi-touch technology, the Industrial Web Panels are as convenient to use as a smartphone or tablet. The sharp colors and high contrast improve readability and user-friendliness. You operate your customized HTML 5 web application on a SIMATIC IPC, an Open Controller or Unified Runtime via the integrated browser.

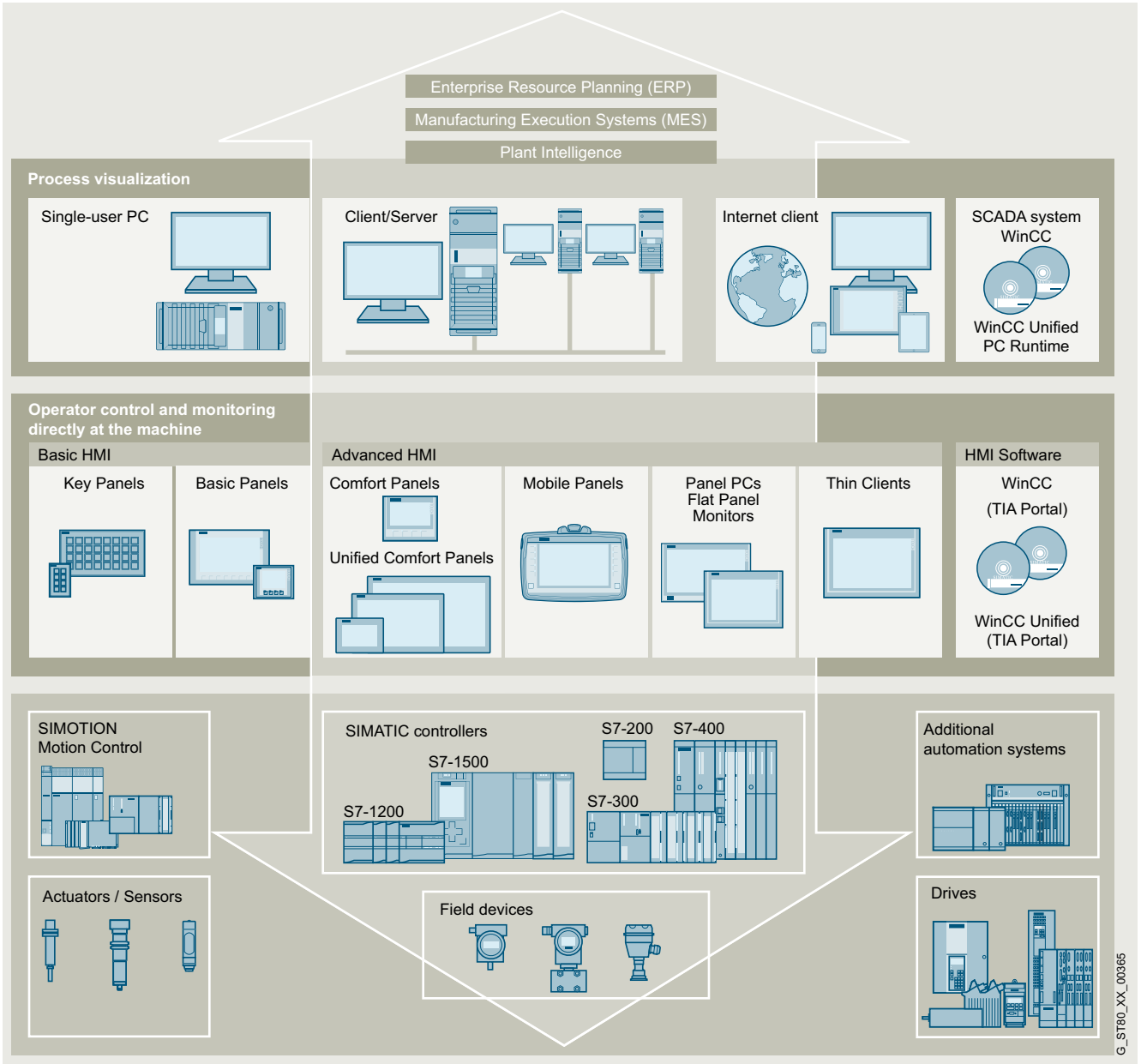
More information is available at this link

Individual HMI devices in customized versions

More information is available at this link

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Overview (continued)



Taking usability to the next level

One swipe, one tap, and the user can immediately see what the selected design looks like on the beverage can. A quick check, and the process is ready to start. Thanks to innovative user guidance, the machine data is so transparent that the complex printing process can be controlled completely intuitively.

Advantages of the solution consisting of SIMATIC WinCC Unified and SIMATIC IPC:

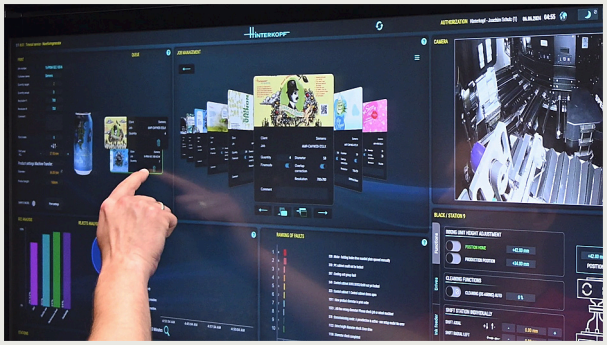
- Efficient engineering and a high degree of openness
- Modern, intuitive user interface as a sales argument and image factor
- Simplified service, shorter downtimes, less remote support

Innovative usability with web technologies at Hinterkopf - Siemens DE

Control system optimizes the productivity of a hot dip galvanizing plant

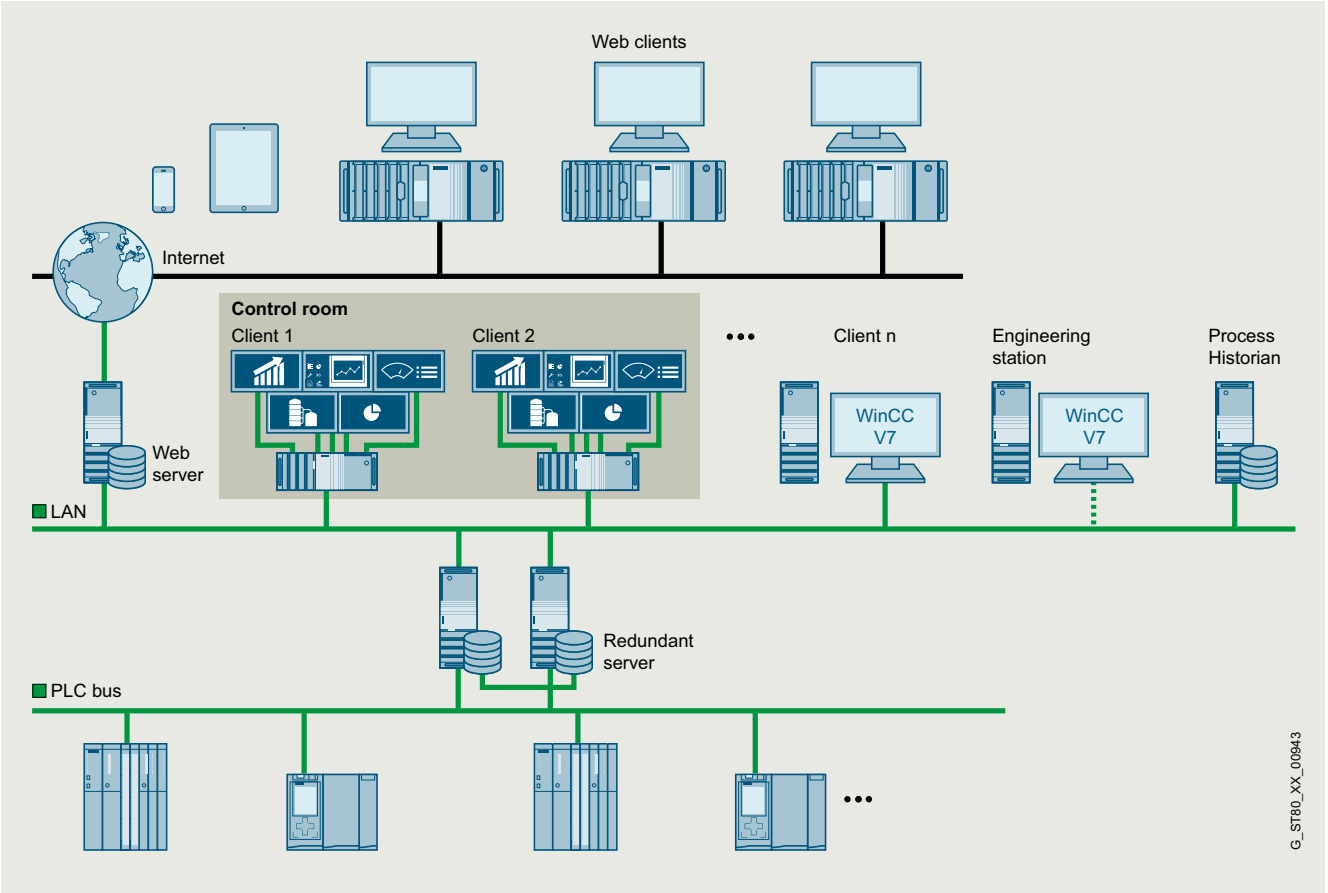
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Overview (continued)



As semi-finished products, galvanized steel sheets play a key role in industrial production, such as car manufacturing. One proven method of protecting steel sheets from rust is the application of a zinc coating in a hot dip galvanizing process, in which strips of sheet steel are drawn through a bath containing liquid zinc. Plants for this process are complex and in continuous operation, thus placing high demands on the process control system and the hardware used. Advantages of the SIMATIC SCADA system and SIMATIC IPC solution:

- SIMATIC WinCC V7/V8 SCADA control system whose scalability and openness also permits the implementation of future function extensions.
- Redundant setup of the control system and operating stations with industry-compatible SIMATIC industrial PCs and Thin Clients.
- Optimum overview thanks to multi-monitor solution in the control room and more than 27 operating stations throughout the plant and production hall.
- Availability of the production data over a long period in SIMATIC Process Historian for reasons of traceability.
- Increased productivity using long-term analyses of plant availability, productivity, energy consumption and quality.
- More effective support and shorter downtimes thanks to fast, web-based access to plants with the SIMATIC WinCC WebNavigator.



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Overview (continued)

Modernization of a plant in the food and beverage industry on the basis of an integrated automation and visualization solution

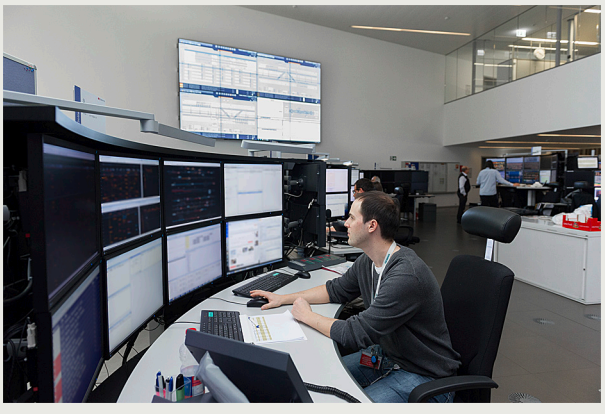


The modernization involved equipping 3 production lines with an expanded SCADA control system, a new control architecture, converters and motor starters. The project was implemented smoothly, and the integrated hardware and software solution with the TIA Portal enabled the simplification of the engineering process.

Advantages of the solution with the SIMATIC SCADA system WinCC Professional in the TIA Portal, S7-1500 and SIMATIC IPC:

- Simplified application engineering
- Efficient monitoring of the production lines enables the optimal path through the production to be defined for each batch.
- Increased productivity
- Simple and intuitive operation implemented thanks to good visual support
- Better control of the motors involved with the process
- Integration of the production data into the existing ERP system
- Faults in the current process can be easily localized

Tunnel control system for the longest railway tunnel in the world



The heart of the monitoring of the entire tunnel infrastructure is the IT/OT and SCADA system WinCC Open Architecture, which is used here as the tunnel control system SIMATIC WinCC Open Architecture. Continuous availability of the entire system is essential to ensure the trouble-free operation of the Gotthard Base Tunnel.

The Gotthard Base Tunnel has a tunnel control center at the south and north portals. The two tunnel control systems installed there monitor and control all of the installed systems and plants. All the required data are acquired, collated and visualized on the tunnel control system. A fully integrated maintenance management tool and an operations control system are also part of the tunnel control system with a large screen display.

The advantages of the solution:

- Highest fail-safety thanks to the presence of doubly redundant tunnel control equipment – Disaster Recovery System (2x2 redundancy)
- Central monitoring of the infrastructure simplifies fault management
- More efficient operation through central control of the entire infrastructure
- Integration of many (sub-)systems thanks to OPC UA as a standardized interface throughout the entire project
- Optimal user friendliness through uniform user interface across all plants, overview of all systems at one work station as well as large screen display (multi-monitor management)

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Overview



SIMATIC Industrial PC

Due to their scalable portfolio, SIMATIC Industrial PCs can be used in a wide range of industrial applications.

Rack PC

Rack PCs are flexible, high-availability industrial PC systems for powerful yet compact applications using 19" technology.

Box PC

SIMATIC Box PCs provide mechanical engineers, plant engineers and control cabinet builders with particularly rugged industrial PC systems for use in powerful yet compact applications.

Panel PC

SIMATIC Panel PCs are suitable thanks to their high industrial compatibility for use in control cabinets, consoles and control panels, as well as directly on the machine. Typical areas of application can be found in both factory and process automation.

Mobile devices

SIMATIC industrial mobile devices open up new areas of application in the context of Industry 4.0. Designed for industrial use, they can impress with their many functions in everyday work. Typical areas of application are in maintenance/service, production, measurement and testing technology, and in local engineering and commissioning.

Industrial monitors

Flexible operating concepts can be implemented with SIMATIC industrial monitors. They are industrial-grade LCD monitors with brilliant displays set apart from the PC.

Devices for special requirements

Selected SIMATIC IPCs are available as fully-enclosed devices (PRO devices) and are ideal for industrial applications in harsh environments due to their extremely rugged design. They are, for example, specially designed for mounting on a support arm/pedestal. As industry-specific versions, selected SIMATIC IPCs also offer variants with stainless steel fronts (HYG devices), e.g. for the food, beverages and tobacco industries.

SIMATIC IPC Software

A graded concept is available for effective early detection of potential failures and minimization of actual downtimes. It consists of hardware and software components especially developed for SIMATIC IPC, which can be used to increase availability on a system-specific basis, depending on safety requirements. In addition, software packages are offered for many SIMATIC IPCs that, when ordered, produce genuine price advantages.

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Overview



Distributed Control System SIMATIC PCS 7:
Room for new perspectives

In process engineering plants, the process control system is the starting point for optimal value added: All procedures and processes can be operated, monitored and influenced with the process control system.

The more powerful the process control system, the more effectively this potential can be used. For this reason, performance is in the foreground with SIMATIC PCS 7, alongside scalability, flexibility, and integration. Starting with planning and engineering, the process control system offers powerful tools, functions and features for cost-effective and efficient plant operation through all phases of the plant life cycle.

Performance through integration

Integration is one of the special strengths of SIMATIC PCS 7. This has many aspects:

- Horizontal integration into TIA
- Vertical integration into hierarchical communication
- System-integrated tools for engineering tasks
- Integration of the field level, including drives, switchgear, etc.
- Integrated functions, e.g. for batch process automation, route control, process safety, energy management, telecontrol tasks, etc.

Horizontal integration

A system for integrated automation of the entire process chain, from incoming raw materials to outgoing goods – this is one of the decisive advantages resulting from the seamless integration of SIMATIC PCS 7 into Totally Integrated Automation.

The process control system is mainly responsible for automating the primary processes here, but it can do much more: All auxiliary facilities, as well as the electrical infrastructure in the form of low-voltage or medium-voltage switchgear and the building management system, can also be integrated into the system.

Integration of selected SIMATIC standard components – automation systems, industrial PCs, network components, or distributed process I/O – into the process control system guarantees optimum

Overview (continued)

interaction of individual components, and secures economic benefits such as simple selection, reduced stock keeping, and global support.

Vertical integration

The hierarchal communication of a company encompasses the field level, the control level, and the process level, up to management and enterprise resource planning (ERP). Thanks to standardized interfaces – based on international industry standards as well as internal interfaces – SIMATIC PCS 7 is able to provide process data for analysis, planning, coordination, and optimization of plant sequences or production and business processes – in real time, and at any location in the company.

Central engineering

SIMATIC PCS 7 convinces with graded functional diversity, consistent operator control philosophy, and uniformly structured engineering and management tools. A central engineering system with a coordinated range of tools for integrated system engineering and configuring of batch automation, safety functions, material transport or telecontrol systems creates value added over the entire life cycle. Reductions in configuring and training costs result in minimization of total cost of ownership (TCO) over the entire plant life cycle.

Functional diversity

Depending on the typical process automation or customer-specific requirements, SIMATIC PCS 7 can be functionally expanded for the following, for example:

- Batch process automation (SIMATIC BATCH)
- Functional safety and protection functions (Safety Integrated for Process Automation)
- Route control for material transport (SIMATIC Route Control)
- Telecontrol of remote units (SIMATIC PCS 7 TeleControl)
- Automation of electrical switchgear (SIMATIC PCS 7 PowerControl)

Custom automation

The unique scalable system architecture makes SIMATIC PCS 7 the ideal basis for cost-effective implementation of individual automation solutions and a cost effective operation of process plants.

SIMATIC PCS 7 users receive sustainable benefits from the modular system platform, based on SIMATIC standard components. Its uniformity enables flexible scaling of hardware and software, as well as perfect interaction, both within the system and beyond system limits. The architecture of the process control system SIMATIC PCS 7 is designed in such a way that the control technology can be used for the project planning according to the customer's requirements, optimally adapted to the dimensions of the plant. The control technology allows retrofit or reconfiguration for capacity expansion or technological changes at any time. If the plant grows, then SIMATIC PCS 7 simply grows along with it – making expensive reserve capacities unnecessary!

Use the opportunities offered by the object-oriented type and instance concept of SIMATIC PCS 7. The technological connections, variant formation and bidirectional comparison of the types with the instances make the control module types (CMT) even more powerful compared to the original function block templates. The technological connections of a Control Module such as parameters, signals or messages can be provided with attributes and used via drag and drop, e.g. on an SFC plan. In turn, options and variants can be used to extend the core function of the CMT with specific

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Overview (continued)

modules or functions, which can be activated individually for each instance. This minimizes the number of types required and thus reduces the effort for maintenance and service. For the technological content of the CM types, the future-oriented Adanced Process Library (APL) is included in the standard of SIMATIC PCS 7. Another major advantage resulting from the comprehensive type and instance concept is the seamless integration into other tools like SIMATIC PCS 7 Plant Automation Accelerator or SIMIT.

Flexibility and performance in engineering

The workflow in the engineering of process plants is and remains a challenge: Numerous participants, many different data formats and multiple interfaces frequently result in transmission errors and system discontinuity and thus in greater time input and costs. Information generally gets lost or needs to be corrected manually when data is exchanged between multiple disciplines.

For the first time, a fully integrated solution is now available for planning and documenting plant projects: the SIMATIC PCS 7 Plant Automation Accelerator. Customers benefit in particular from consistent engineering without system discontinuities between automation planning and the control system.

The object-oriented approach of the SIMATIC PCS 7 Plant Automation Accelerator makes it possible to work on a central data platform, thus ensuring completely integrated planning – from plant engineering through to automation – based on an electronic workflow. This workflow ranges from planning, the preparation of bids – including bills of material – and the automatic generation of control data from the electrical plans of the SIMATIC PCS 7 process control system, through to controlled mass data engineering and direct as-is documentation of the plant.

This modular engineering approach enhances overall project efficiency and minimizes risks. A high level of standardization and simple configuration additionally save engineering time and costs during the implementation phase. Simple synchronization between planning and engineering avoids duplicate input and interface losses and reduces project runtimes.

Flexibility in operation

Process control also becomes more complex due to the multi-layer nature of automation engineering and the increased merging with information technology. Intuitive and fault-free operation is therefore more important than ever with regard to efficient working and the minimization of downtimes and servicing requirements. Using effective Advanced Process Control (APC) functions and an excellent operator system, SIMATIC PCS 7 supports optimization as well as user-friendly and safe control of the process. Monitoring of product quality and performance indicators additionally allows the process to be operated more economically. At the same time, SIMATIC PCS 7 convinces with high flexibility, plant availability, and investment security.

Process control and maintenance

SIMATIC PCS 7's operator system is used to monitor process operation using various views, and permits interventions when necessary. Its architecture is flexible and scalable – from single-user systems up to multi-user systems with a redundant client/server architecture. The operator interface takes account of the current specifications of NAMUR (user association of automation technology in the process industries) and PI (Profibus International) and offers a high level of user-friendliness for simple, intuitive interaction with the plant. Ergonomic symbols, task-oriented faceplates, uniform representation of status information, and optimized alarm functions allow safe process control.

The alarm management function integrated in SIMATIC PCS 7 is able to focus on essential alarms and to specifically guide the operator in exceptional circumstances. In this way, it systematically reduces the workload of operating staff.

Preventive and predictive maintenance strategies reduce total cost of ownership. With the SIMATIC PCS 7 Maintenance Station, maintenance personnel always have a watchful eye on critical production equipment such as pumps, valves, distillation columns or motors, and can carry out the relevant maintenance measures in good time before servicing is required – independent of the maintenance plan and without the risk of an unplanned plant standstill.

Process optimization

SIMATIC PCS 7 supports process optimization in many different manners, including:

- Control Performance Monitoring
- Advanced Process Control
- Process Historian

The Control Performance Monitoring function monitors and signals the control quality of the closed-loop control block. If the performance declines, the controller can be optimized in good time or specific maintenance measures can be initiated.

The integrated I&C libraries of SIMATIC PCS 7 also provide higher quality closed-loop control functions with which cost-effective Advanced Process Control applications can be implemented: multi-variable control, predictive control, or override control. It is thus possible to effectively improve profitability, product quality, and safety in in small and medium-sized plants.

Current and historic process data form the basis of all optimization. Secure and user-friendly real-time data storage and analysis is handled using the Process Historian. The process values, messages, and batch data managed in the database of the Process Historian can be called extremely rapidly. User-specific processing and visualization of this historic data are supported by the information server, which is a reporting system based on the Microsoft Reporting Services.

SIMATIC PCS 7 system and technology components

With the rugged, high-performance SIMATIC PCS 7 system components from Catalog ST PCS 7, you already have a versatile platform for cost-effective implementation and economical operation of your process control systems. Perfect interplay of these system components makes it possible for you to sustain high-quality production and to establish new products significantly faster on the market.

With SIMATIC PCS 7 technology components from Catalog ST PCS 7 T that can be seamlessly integrated into the process control system, you can expand the functional scope of the system components in a carefully targeted manner for specific automation tasks.

This covers a wide spectrum, for example:

- Telecontrol for monitoring and controlling remote plant units
- Automation technology for electrical low-voltage or medium-voltage switchgear
- Industry-specific automation systems for the cement and mining industries, as well as for laboratory and training facilities
- Graphical objects for task-oriented optimization of process visualization
- Block libraries for technological functions, package unit and panel integration, monitoring and analyzing mechanical assets, as well as for building automation systems (heating, ventilation, air-conditioning – FMCS/HVAC)
- Editors and function blocks for the efficient configuration of small or medium-sized automation systems with simple parameter control and materials management

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Overview (continued)

- Process analytical technology for quality assurance through optimization of development and production processes based on up-to-date measurements, and critical quality and performance attributes
- Simulation system for testing and commissioning of plant-specific application software
- Flexible, high-performance Manufacturing Execution System (MES)
- System expansion for operator systems for the integration of third-party controllers, programmable logic controllers and package units
- Products for migration of the process control systems TELEPERM M, APACS+/QUADLOG or Bailey INFI 90/ NET 90 with SIMATIC PCS 7

Additional functionality can be integrated using add-on products

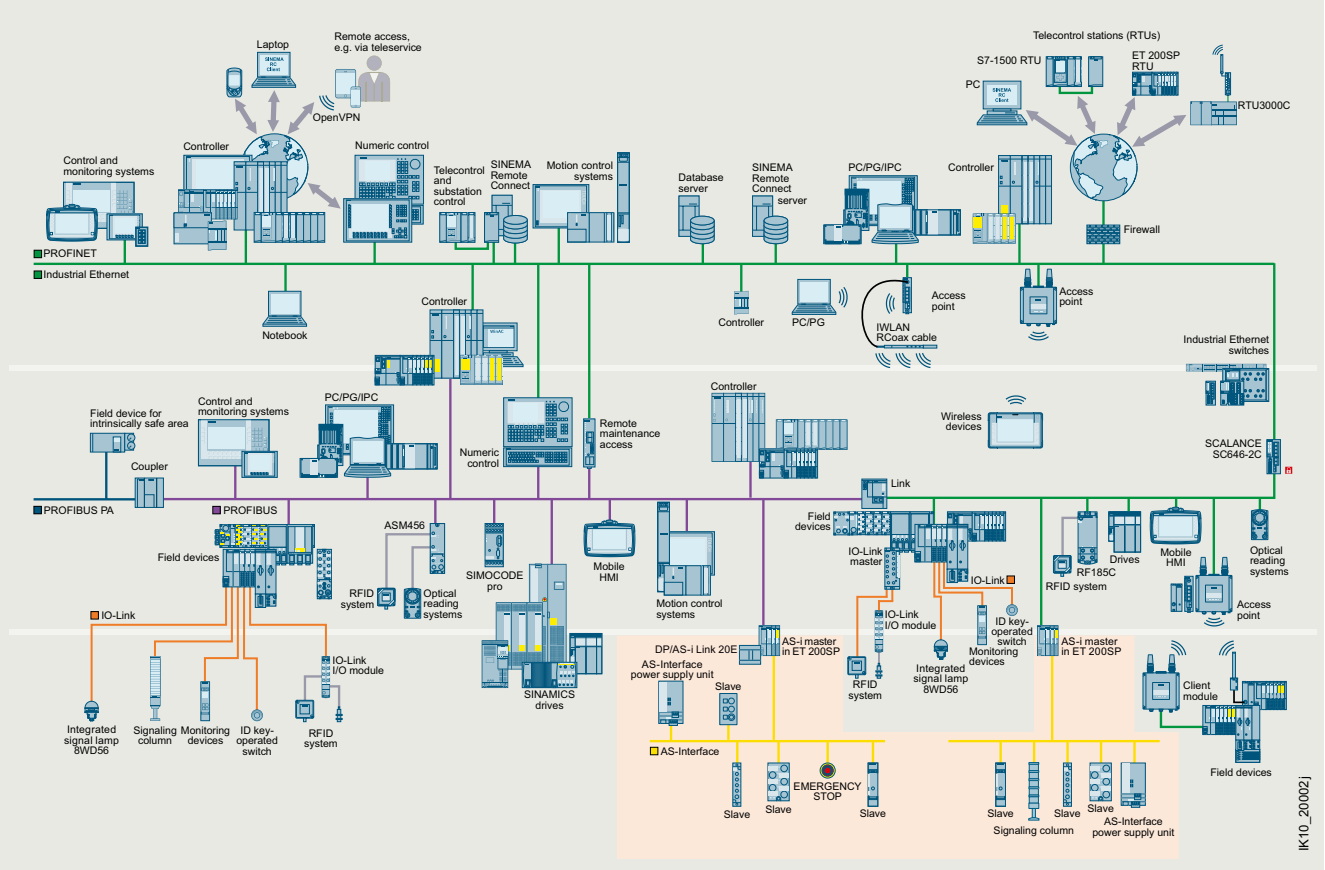
Modularity, flexibility, scalability, and the openness of SIMATIC PCS 7 offer optimal prerequisites for integrating supplementary components and solutions in the process control system in an applicative manner and thus extend and round off its functionality.

Many supplementary add-on products for SIMATIC PCS 7 have been developed by Siemens as well as by external partners (see Catalog ST PCS 7 AO, Add-ons for the SIMATIC PCS 7 Process Control System). These software packages and hardware components authorized by the system manufacturer enable cost-effective implementation of SIMATIC PCS 7 for special automation tasks.

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Overview

Industrial communication – the backbone of automation



Powerful and open communication systems ensure trouble-free communication for automation systems, covering

- data communication or
- process or field communication.

Openness and flexibility of the individual communication systems in different topologies enable linking of a wide variety of systems and their subsequent expansions. By using standardized communication systems, it is possible to connect standardized components from different suppliers without any problems. This ensures maximum protection of investment, as existing networks can be extended without any adverse effects.



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Overview (continued)

In the area of industrial communication, Siemens provides components for an integrated overall solution beyond the network's limits.

These include:

- Passive network components, e.g. FastConnect cabling systems
- Active network components, e.g. SCALANCE X Industrial Ethernet switches as well as RUGGEDCOM devices for harsh ambient conditions.
- Interfaces for connecting programmable controllers to the communication systems:
  - Integrated interfaces
  - Communications processors
- Components for wireless networks, e.g. Industrial Wireless for private 5G networks as well as 5G routersLAN, SCALANCE W Access Points, and Client Modules for private 5G networks as well as 5G routers
- Components for industrial security, e.g. network security with Industrial Security Appliances SCALANCE S
- Remote monitoring and control with solutions for both telecontrol systems and units.
- Simple remote access for TeleService and remote maintenance with SCALANCE M and SINEMA Remote Connect
- Network transitions, e.g. IE/PB LINK PN IO
- Components for AS interface
- SINEC software family for efficient network management

More information

Internet:
www.siemens.com/industrial-communication

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Overview



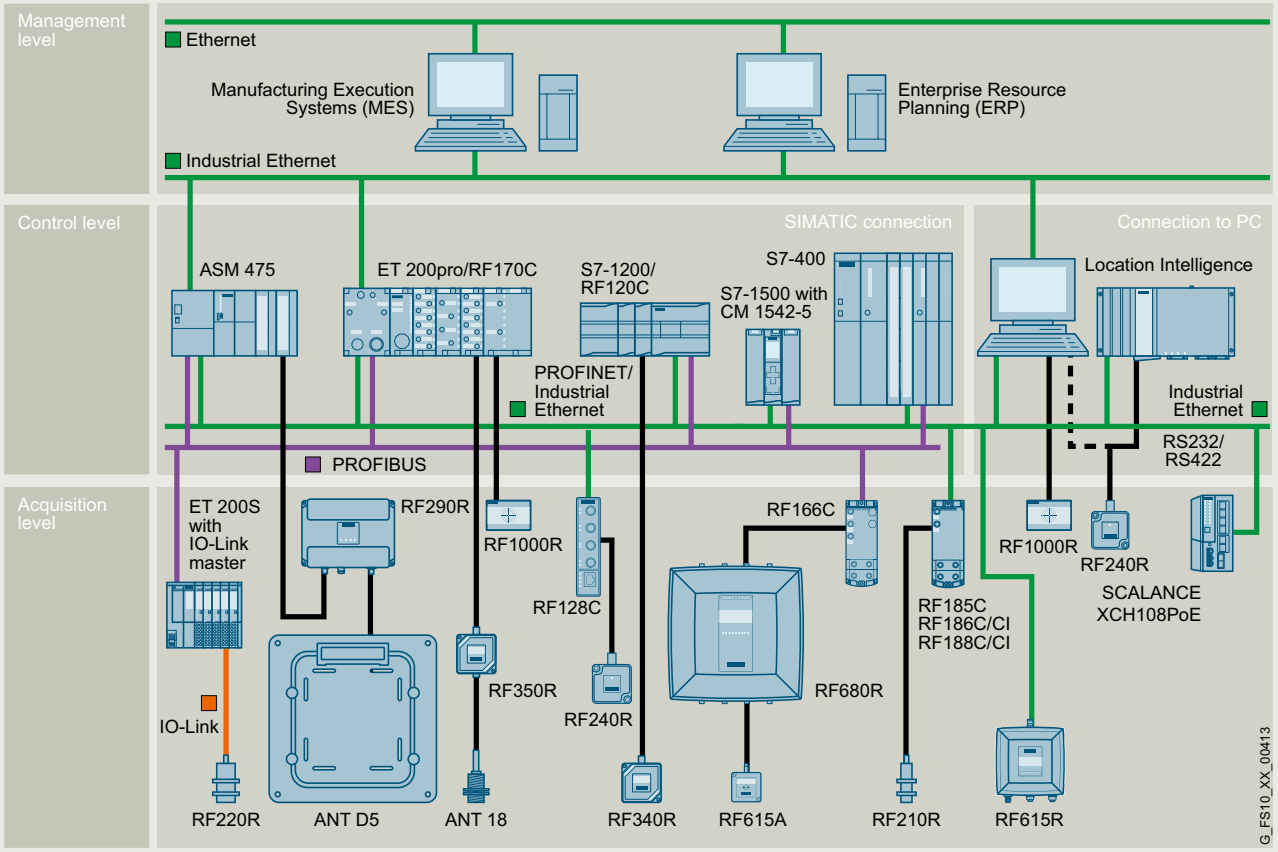
SIMATIC Ident and Location Intelligence for cross-company data intelligence

Industrial processes in the digital enterprise require full transparency and a high degree of customization. Our solutions close the gap between the real and the digital world – and thus open up new added value potential throughout the production and supply chain.

Already today, we offer the industry of tomorrow a unique, comprehensive, and end-to-end portfolio of RFID-based identification solutions as well as intelligent software for capturing, processing, and analyzing production and process data. With Location Intelligence, SIMATIC Ident creates end-to-end transparency regarding status, movements, and process flows, enabling well-founded, data-driven optimization of quality, efficiency, and process reliability. Connectivity to TIA enables the seamless integration of products into automation solutions. Integration into existing IT and cloud applications ensures maximum flexibility and future-proofs manufacturing. Plant availability, utilization rates, and optimization potentials are made transparent, forming the basis for faster decision-making and continuous improvement—for enhanced competitiveness and a flexible future.

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Overview (continued)



More information

Internet:
www.siemens.com/simatic-ident

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Overview

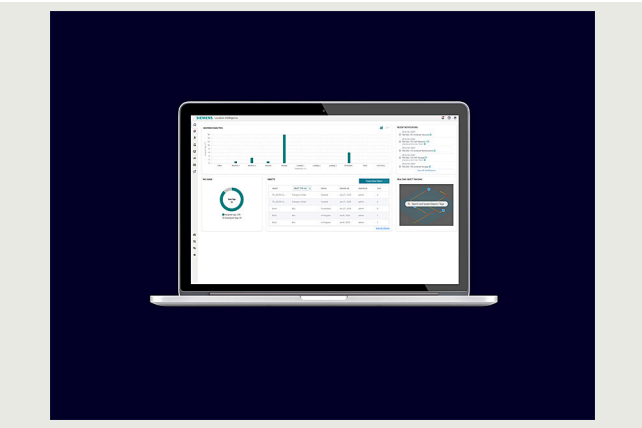
RFID systems



Openness and flexibility of the individual communication systems in different topologies enable linking of a wide variety of systems and their subsequent expansions. By using standardized communication systems, it is possible to connect standardized components from different suppliers without any problems. This ensures maximum protection of investment, as existing networks can be extended without any adverse effects.

Line of sight between the write/read device and the transponder is not necessary. Rugged, compact readers in a high degree of protection with either integrated or external antennas are available for interference-free data communication. Cost-efficient, maintenance-free, passive labels and passive transponders in various designs and with various memory capacities are likewise available, as are powerful antennas.

Location Intelligence



The web-based software Location Intelligence provides real-time transparency into production and logistics processes. By transforming real-time data into actionable insights, it helps identify bottlenecks, optimize material flow, and improve operational decisions. Manufacturers benefit from higher throughput, faster response times, reduced search effort, and reliable, data-driven workflows that increase the efficiency and competitiveness of the entire plant.

More information

Internet:
www.siemens.com/rfid
www.siemens.com/location-intelligence

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15/2	**Drive systems**
15/2	SINAMICS drive system
15/11	SIMOTICS E drive system for extra low-voltage
15/12	**Overvoltage protection**
15/12	SICROWBAR overvoltage protection
15/13	**Timing, coupling and monitoring relays**
15/13	SIRIUS relays
15/15	**Measuring systems**
15/15	Motion Control Encoder measuring systems
15/16	**Automation systems**
15/16	SINUMERIK CNC automation systems
15/16	SINUMERIK 828D
15/17	SINUMERIK ONE
15/18	**System cabling**
15/18	MOTION-CONNECT connection systems

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Overview

SINAMICS frequency converters



SINAMICS frequency converters are the ultimate solution for all drive applications. From low voltage to direct current (DC), our frequency converters meet your needs.
Thanks to their high energy efficiency and versatile applications, they support demand-based drive control in industrial applications. The digital functions of SINAMICS frequency converters enable flexible integration into modern automation and drive concepts.
www.siemens.com/sinamics

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Overview (continued)

Low voltage									Direct voltage
Standard performance frequency converters		Distributed frequency converters	Industry-specific frequency converters	Servo converters		High performance frequency converters			DC converters
									
SINAMICS V20 G120C G120 G200 G210 G210C	SINAMICS G130 G150	SINAMICS G115D G120D SIMATIC ET 200pro FC-2	SINAMICS G120X G210X	SINAMICS V90 S200	SINAMICS S210 (6SL5...)	SINAMICS G220	SINAMICS S120 S120M S220	SINAMICS S150 S220	SINAMICS DCM DCP [1]
0.12 kW to 250 kW	75 kW to 2700 kW	0.37 kW to 7.5 kW	0.75 kW to 630 kW	0.05 kW to 7 kW	0.05 kW to 7 kW	0.55 kW to 160 kW	0.55 kW to 5700 kW	75 kW to 1200 kW	6 kW to 30 MW
Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines, refrigerated display counters, fitness equipment, ventilation systems, single-axis positioning applications in machine and plant engineering	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders	Conveyor technology, single-axis positioning applications (G120D)	Pumps, fans, compressors, building management systems, process industry, HVAC, water/waste water industries	Handling machines, packaging machines, automatic assembly machines, metal forming machines, printing machines, winding and unwinding units	Packaging machines, handling equipment, feed and withdrawal devices, stacking units, automatic assembly machines, laboratory automation, wood, glass and ceramics industry, digital printing machines	Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines, refrigerated display counters, fitness equipment, ventilation systems, single-axis positioning applications in machine and plant engineering	Production machines (packaging, textile and printing machines, paper machines, plastic processing machines), machine tools, plants, process lines and rolling mills, marine drives, test bays	Test bays, cross cutters, centrifuges	Rolling mill drives, wire-drawing machines, extruders and kneaders, cableways and lifts, test bay drives
Catalog D 31.1 D 36.3 D 36.4	Catalog D 11	Catalog D 31.2	Catalog D 31.5 D 36.5	Catalog D 33 D 37.1	Catalog D 32	Catalog D 36.1	Catalogs D 21.3, D 21.4 D 38	Catalog D 21.3 D 38	Catalog D 23.1, SiePortal
Engineering tools (e.g. Siemens Product Configurator, TIA Selection Tool, DriveSim Engineer, STARTER and SINAMICS Startdrive)									

[1] DC/DC controllers, see SiePortal.

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Overview (continued)

SINAMICS V20 – the perfect solution for basic applications



- Power range from 0.12 kW to 30 kW
- Voltage:
  - 230 V 1 AC: 200 V to 240 V 1 AC (-15 % to +10 %)
  - 400 V 3 AC: 380 V to 480 V 3 AC (-15 % to +10 %)
- Integrated USS and Modbus RTU interfaces
- Integrated braking module for all 400 V 3 AC versions
- Parameter readout and cloning without power supply
- Integrated connection and application macros
- ECO mode for *U*/*f*, U^2/f
- Integrated hibernation mode in idle state
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS V20 Smart Access web server module
- Expansion of 400 V converters with two digital inputs and two digital outputs (relay outputs) thanks to optional SINAMICS V20 I/O Extension Module

More information

- Catalog D 31.1
- Internet:
  http://www.siemens.com/sinamics-v20
  http://www.siemens.com/d31-1
  https://sieportal.siemens.com

SINAMICS G220 – the variable frequency converter for all industries



SINAMICS G220 is the new high-performance variable frequency converter designed to meet current and future challenges in every industry. Thanks to improved hardware and software, SINAMICS G220 takes digital drive technology to a new level, making applications more efficient, secure and future-proof.

More information

- Catalog D 36.1
- Internet:
  http://www.siemens.com/sinamics-g220
  http://www.siemens.com/d36-1
  https://sieportal.siemens.com

SINAMICS G120X – the infrastructure converter for HVAC/water/wastewater



- Power range from 0.75 kW to 630 kW
- The specialist for pump, fan and compressor applications
- Thanks to the integrated DC link reactor with a maximum output of 250 kW and optional resistance to harmful gases up to environmental class 3C3, the rugged and dependable design ensures reliable, stable and largely robust operation.
- Variety of functions relevant for pumps, fans and compressors, e.g. deragging or pipe fill mode, automatic restart, flying restart, flux reduction, cascade connection, hibernation mode and real-time clock
- Functions especially for building technology as well as heating/air conditioning/ventilation applications, e.g. four integrated PID controllers, essential service mode, bypass mode and programmable time switches

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Overview (continued)

- Communication: PROFINET, EtherNet/IP, PROFIBUS DP, USS, Modbus RTU, BACnet MS/TP
- Innovative hardware and software functions, e.g. for controlling synchronous reluctance drive systems

More information

- Catalog D 31.5
- Internet:
  http://www.siemens.com/sinamics-g120x
  http://www.siemens.com/d31-5
  https://sieportal.siemens.com

SINAMICS G120C – the compact and versatile frequency converter with optimum functionality



- Compact unit
- Highest power density in its class
- Power range from 0.55 kW to 132 kW
- Easy commissioning and maintenance
- With BOP-2 or IOP-2 operator panel
- Safety Integrated: STO
- Available communication: PROFIBUS DP, USS, Modbus RTU, PROFINET, EtherNet/IP
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS G120 Smart Access web server module
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.1
- Internet:
  http://www.siemens.com/sinamics-g120c
  http://www.siemens.com/d31-1
  https://sieportal.siemens.com

SINAMICS G120 – the modular single-motor drive for low to medium power ratings

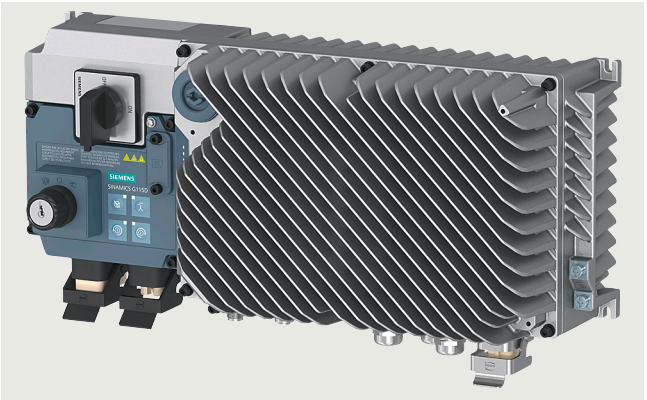


- Power range from 0.37 kW to 250 kW
- Safety Integrated: STO, SS1, SBC, SLS, SDI and SSM encoderless
- Communication via PROFIBUS, PROFINET, EtherNet/IP, RS485, USS, Modbus RTU, CANopen, BACnet MS/TP
- Parameter copy function for standard commissioning
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS G120 Smart Access web server module
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.1
- Internet:
  http://www.siemens.com/sinamics-g120
  http://www.siemens.com/d31-1
  https://sieportal.siemens.com

SINAMICS G115D – the distributed drive system



The SINAMICS G115D distributed drive system meets all the requirements that system manufacturers place on drives for applications in conveyor technology with a focus on the intralogistics and airport industries as well as for simple, horizontal applications in the automotive and food and beverage industries. The converter is supplied with degree of protection up to IP66 and sets standards in terms of efficiency – from the installation phase to commissioning

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Overview (continued)

and all the way to handling. The SINAMICS G115D drive system is the first choice for users who want to move conveyed material quickly and efficiently.

Integration via PROFINET communication with PROFIsafe, AS-Interface, EtherNet/IP into a higher-level control system is very easy thanks to full TIA Portal integration, which provides a tool as well as an operating and data management concept. In addition, an optional web server module is available with the web server module SINAMICS G120 Smart Access (SAM) – a WLAN-based web server solution for simple and fast wireless setup with tablets or smartphones during commissioning and for diagnostics.

More information

- Catalog D 31.2
- Internet:
  http://www.siemens.com/sinamics-g115d
  http://www.siemens.com/d31-2
  https://sieportal.siemens.com

SINAMICS G120D – the distributed single drive for high-performance solutions



- Positioning capability
- Power range from 0.75 kW to 7.5 kW
- Energy-efficient due to regenerative feedback and low line harmonic distortion
- Safety Integrated: STO, SS1, SDI, SSM and SLS encoderless
- Thanks to the modular design, electronics stocks are minimal
- Interchangeable memory card
- Communication via PROFIBUS DP, PROFINET, EtherNet/IP
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.2
- Internet:
  http://www.siemens.com/sinamics-g120d
  http://www.siemens.com/d31-2
  https://sieportal.siemens.com

SINAMICS G130/SINAMICS G150 – the universal frequency converters for high-performance single drives





- Available as a standardized control cabinet or built-in units
- Output range from 75 kW to 800 kW or 2700 kW with parallel switching
- Specially for drives with quadratic and constant load characteristics, medium performance requirements, but no regenerative feedback capability
- Service-friendly thanks to easy-to-access device modules
- Communication via PROFIBUS DP, PROFINET, EtherNet/IP
- Sensorless vector control
- Safety Integrated: STO, SBC, SS1 with SBR/SAM, SS2, SLS, SOS, SSM, SDI, SLA, SBT
- Simple commissioning and parameterization via the AOP30 Advanced Operator Panel or PC-supported using the STARTER and SINAMICS Startdrive commissioning tools

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Overview (continued)

More information

- Catalog D 11
- Internet:
  http://www.siemens.com/sinamics-g130
  http://www.siemens.com/sinamics-g150
  http://www.siemens.com/d11
  https://sieportal.siemens.com

SINAMICS S200 – the single axis AC/AC servo drive system in standard servo motion market



Example: SINAMICS S200 servo drive system consisting of a SINAMICS S200 servo converter, 200 ... 240 V 1 AC / 3 AC, PROFINET, frame size FSB, a SIMOTICS S-1FL2 servomotor, shaft height 30, metal hybrid connector, outlet direction drive end (DE) and MOTION-CONNECT 350 dual cables for power and communication

The SINAMICS S200 servo drive system is a single axis AC/AC servo drive system with compact design, high dynamic performance, ease of use and high reliability for motion control applications in standard servo motion market. It comprises SINAMICS S200 servo converters, SIMOTICS S-1FL2 servomotors, MOTION-CONNECT 350 and 380 connection systems and engineering tools.

System components

SINAMICS S200 servo converters

The SINAMICS S200 servo converters consist of a basic version and a standard version with pulse train input position control (PTI) or PROFINET RT/IRT (PN) to meet various needs of applications and work perfectly together with SIMATIC controllers.

- SINAMICS S200 Basic servo converters, power range 0.1 to 1 kW at 200 ... 240 V 1 AC / 3 AC
- SINAMICS S200 servo converters, power range 0.1 to 1 kW at 200 ... 240 V 1 AC / 3 AC and 0.2 to 7 kW at 380 ... 480 V 3 AC

SIMOTICS S-1FL2 servomotors

With flexible encoder options, including absolute encoders 17-bit singleturn, 21-bit singleturn and 21-bit singleturn + 12-bit multiturn, the system provides precise and accurate performance. The encoders can be used without a battery, making it easy to operate and maintenance.

- Low Inertia for high dynamic performance
- Medium Inertia for dynamic and smooth operational performance
- High Inertia for smooth operational performance

MOTION-CONNECT 350 and 380 connection systems

The cables are available in lengths of up to 30 m and one step further optimized in easy and secure installation with "one-push-lock" motor connecting solution for motor shaft heights 20, 30 and 40.

- MOTION-CONNECT 350 cables, which provide a connection solution for fixed installation applications
- MOTION-CONNECT 380 cables, which provide a connection solution for drag chain installation applications that require a high number of bending cycles

More information

- Catalog D 37.1
- Internet:
  http://www.siemens.com/sinamics-s200
  http://www.siemens.com/d37-1
  https://sieportal.siemens.com

SINAMICS S210 – the single-axis servo drive for highly dynamic applications



The servo drive system comprises a SINAMICS S210 servo converter, a SIMOTICS S-1FK2, S-1FT2 or S-1FS2 servomotor and a matching One Cable Connection (OCC) for connecting the motor to the converter. SINAMICS S210 is a single-axis AC/AC servo converter system with high performance and dynamic response for mid-range Motion Control applications.

SINAMICS S210 servo converters are available for the following line voltages:

- 200 V to 240 V 1 AC (1 AC series)
- 200 V to 480 V 3 AC (3 AC series)

The high performance of the SINAMICS S210 servo drive system in conjunction with the SIMOTICS S-1FK2, S-1FT2 or S-1FS2 servomotor derives from the following features:

- Low moment of inertia and high overload capability of the motor
- High-resolution encoder with fast scanning
- Current controller clock cycle of 62.5 µs and a pulse frequency of 8 kHz of the servo converter

This enables short cycle times on the machine even with complex motion control.

More information

- Catalog D 32
- Internet:
  http://www.siemens.com/sinamics-s210
  http://www.siemens.com/d32
  https://sieportal.siemens.com

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Overview (continued)

SINAMICS S220 – precise drive technology for modern automation



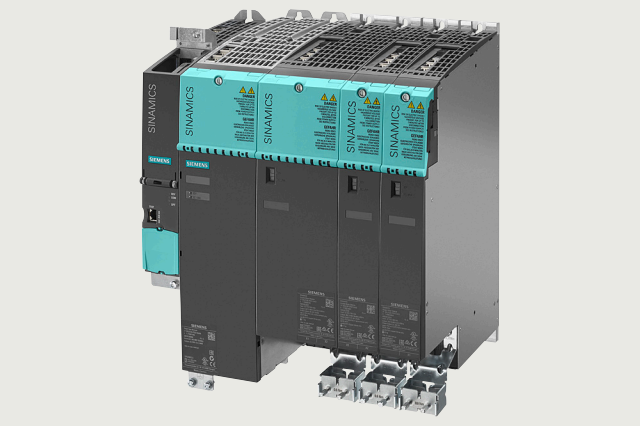
The SINAMICS S220 is a modular drive system for applications with high demands on precision, performance and integration in automation environments. The compact design, diverse module types and extensive digital functions enable flexible applications in different industrial sectors. Digital services such as simulation, condition monitoring and predictive maintenance support efficient project processes and high system availability.

- High power density with reduced space requirements
- Precise motion control with advanced safety features
- Modern system architecture for optimal connectivity and future expansions

More information

- Internet:
  http://www.siemens.com/sinamics-s220

SINAMICS S120 – the flexible, modular drive system for demanding single-axis and multi-axis applications from the low-end to the high-end performance range







- Modular drive system for single-axis and multi-axis applications in all areas of machine and plant manufacturing
- Servo/vector control, U/f control
- Power range from 0.55 kW to 5700 kW
- Various types of construction for different application areas
- Highly flexible due to, for example, modular system architecture, different cooling methods, support for a wide range of motors/encoders, easy expansion
- High degree of scalability with regard to performance, number of axes, functionality
- Integrated safety functions
- Comprehensive motion control functionality
- High availability and efficiency, even in unstable networks
- Automatic parameterization and easy drive commissioning/optimization

More information

- Catalogs D 21.3, D 21.4
- Internet:
  http://www.siemens.com/sinamics-s120
  http://www.siemens.com/d21-3
  http://www.siemens.com/d21-4
  https://sieportal.siemens.com

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Overview (continued)

SINAMICS S150 – the sophisticated drive solution for single drives in the medium to top performance ranges



- Particularly suitable for applications with high requirements regarding precision and dynamic response in the mid to upper performance range, as well as for frequent braking cycles with high braking energies and four-quadrant operation
- Ready-to-operate control cabinet
- Power range from 75 kW to 1200 kW
- Straightforward configuring and commissioning provided by the SIZER, SINAMICS Startdrive and STARTER engineering tools
- High availability and efficiency, even in unstable networks
- Line-friendly operation thanks to Clean Power Filter (line feedback < 1 %)
- Reactive power compensation possible
- Equipped as standard with PROFINET or PROFIBUS DP interface for connection to higher-level controls

More information

- Catalog D 21.3
- Internet:
  http://www.siemens.com/sinamics-s150
  http://www.siemens.com/d21-3
  https://sieportal.siemens.com

SINAMICS DCP – the compact DC-DC Converter for industrial applications



With the SINAMICS DCP (DC Power Converter), Siemens extends its portfolio of Compact DC-DC Converters.

In these, Siemens is combining its expertise in DC technology with the advantages of the well-proven SINAMICS family. SINAMICS DCP is setting new standards when it comes to quality, reliability and technical functionality.

The SINAMICS DCP is suitable for industrial drive train applications. As a bidirectional boost and buck converter on both sides with scalable power rating, it combines multiple functions in one single device. With variable voltage levels, current can flow in both directions. This makes the SINAMICS DCP ideal for charging and discharging batteries and supercapacitors.

The high internal switching frequency makes a compact design and low weight possible. As a result, it can be installed in electrical cabinets in a space-saving way.

PROFIBUS is used as the standard communications interface. Optionally, either PROFINET, EtherNet/IP or Modbus TCP can be retrofitted as an additional interface via the CBE20 interface card. The BOP20 Basic Operator Panel is available for status displays and local operator control.

Special features

- Bidirectional boost and buck converter in one unit (on both sides of the device)
- High efficiency
- High switching frequency
- Compact: The reactor, power unit and control station form one unit
- Temperature-controlled fans (only for DCP 120 kW/DCP 250 kW)
- Battery charging characteristic
- Communications interfaces: PROFIBUS (standard), optional EtherNet/IP or Modbus TCP

The functionality can be expanded with other SINAMICS components such as Active Line Modules.

Software feature

- Voltage and current regulation
- 3 overload profiles
- Stable voltage in the DC link

Power rating

The SINAMICS DCP is available with a power rating of 30 kW, 120 kW and 250 kW.

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Overview (continued)

More information

- Internet:
  http://www.siemens.com/dc-dc-converter
  https://sieportal.siemens.com

SINAMICS DCM – the scalable drive system for basic and sophisticated DC drive applications



- Power range 6 kW to 30 MW
- For machinery and plants in industry
  - Steel/aluminum
  - Plastic
  - Printing
  - Paper
  - Hoisting gear
  - Mining
  - Oil and gas
  - Static excitation units
  - Heating applications
  - Magnet applications
- New systems and retrofit business
- Communication as standard via PROFIBUS DP, RS485 or USS, and optionally via PROFINET, EtherNet/IP or Modbus RTU
- Safety Integrated: STO, SS1 acc. to IEC 61508 SIL 3 as well as EN ISO 13849-1 PL e
- Control unit variance
- Field power supply in line with requirements
- Electronics power supply for connection to 24 V DC
- Power unit isolated to ground (isolated voltage sensing)
- Free function blocks and Drive Control Chart (DCC)
- Expandable functionality using SINAMICS components
- Single-phase operation possible
- Coated modules and nickel-plated copper busbars
- Wide temperature range
- High overload capability
- Low torque ripple at low speeds
- Very compact design

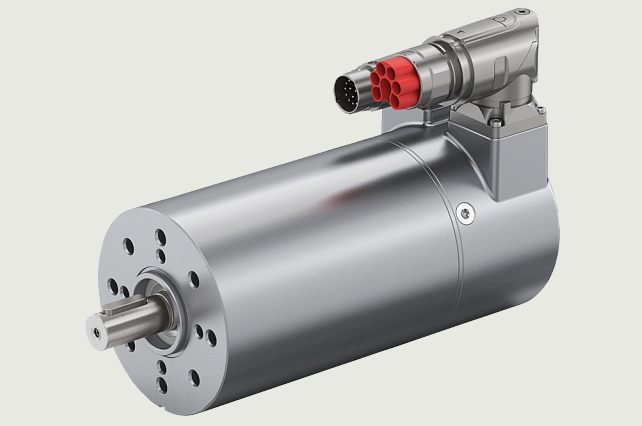
More information

- Catalog D 23.1
- Internet:
  http://www.siemens.com/sinamics-dcm
  http://www.siemens.com/d23-1
  https://sieportal.siemens.com

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Overview

SIMOTICS E – Extra low-voltage motors with oder without integrated converters

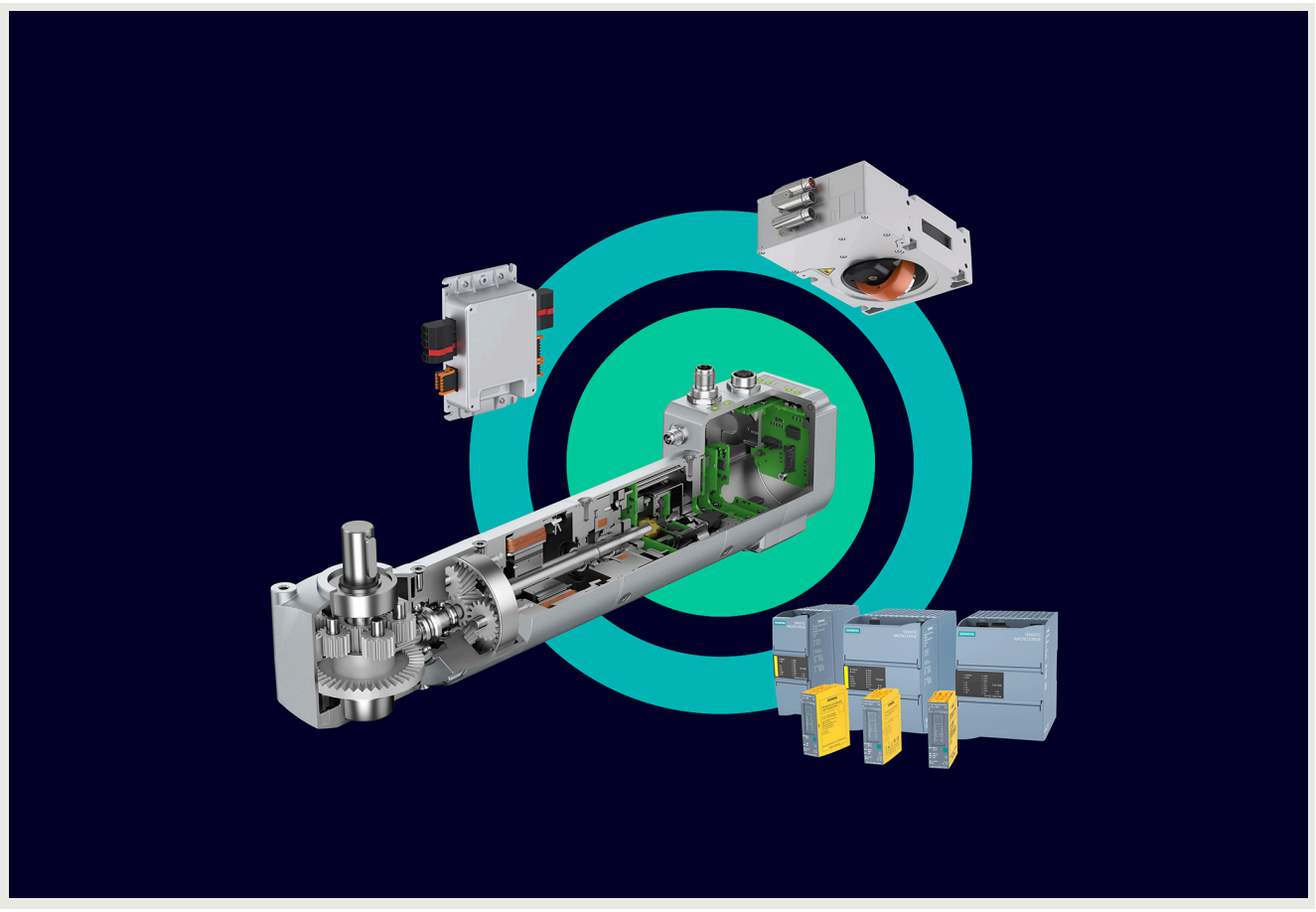


Example: SIMOTICS E-1EE1 extra low-voltage motor without integrated converter and without gearbox; shaft height 40R, length 60

The SIMOTICS E extra low-voltage motors, with or without integrated converters, are a targeted addition to the Siemens portfolio and strengthen our role as a technology leader in factory automation and digitalization. They are ideal for intelligent, battery-powered systems in intralogistics and production – for example in mobile robots, driverless transport systems or in the automated conversion of machines. In addition to battery-powered solutions, the focus is also on stationary applications and can be served in a targeted manner with the portfolio.

The VTD extra low-voltage converters or the SIMATIC MICRO-DRIVE extra low-voltage converters control SIMOTICS E extra low-voltage motors without an integrated converter precisely and efficiently. The result: more flexibility and productivity.
www.siemens.com/simotics-e

For more information on ordering and configuration, see Siemens Product Configurator in SiePortal at:
www.siemens.com/simotics-e/configuration
and in Catalog D 60 at:
www.siemens.com/d60



SIMOTICS E drive system for extra low-voltage with SIMOTICS E extra low-voltage motors, VTD and SIMATIC MICRO-DRIVE extra low-voltage converters and SIMOTICS E ArgoDrive driving steering system

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Overview

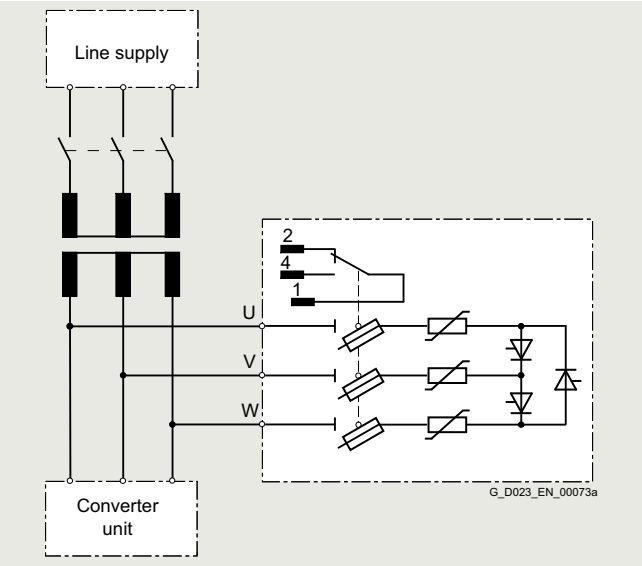
SICROWBAR AC



SICROWBAR AC is used to protect power semiconductors in converters (thyristors and diodes) against overvoltage that occurs between the phases of a three-phase network. The range of applications is not restricted to protecting DC drive converters, but also comprises infeed/regenerative feedback units of the AC drive technology that are equipped with thyristors.

Overvoltage that occurs on the AC side of converters is mainly caused by switching operations when disconnecting from the line supply at the transformer's primary side. This applies both to operational switching operations (shutdown at no-load) as well as in the case of a fault (shutdown under load).

The overvoltage protection is mainly used in the following configuration::



More information

- Catalog D 23.1
- Internet:
  https://www.siemens.com/d23-1
  https://sieportal.siemens.com

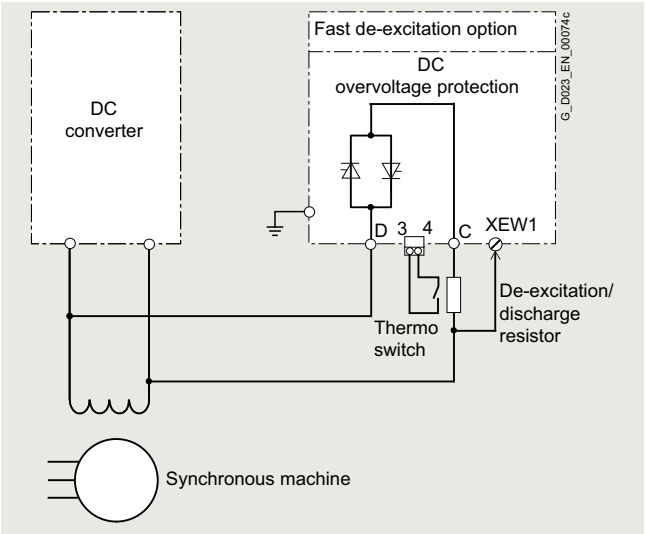
Overview (continued)

SICROWBAR DC



SICROWBAR DC protects coils and converters against overvoltage conditions when they are used to supply large inductances, for instance, the excitation coils of synchronous machine motors, DC machine motors or hoisting solenoids. An appropriate de-excitation/discharge resistor must be provided. A thermostatic switch can be ordered as an option for the resistor from the manufacturer.

The fast de-excitation option G11 (module 7VV3003-7FG00) makes it possible to initiate fast de-excitation, triggered by a higher-level signal, for the 7VV3003-5... units.



More information

- Catalog D 23.1
- Internet:
  https://www.siemens.com/d23-1
  https://sieportal.siemens.com

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Overview



Complete range of SIRIUS relays

More information

Homepage, **see** www.siemens.com/sirius
SiePortal, **see** www.siemens.com/sirius-sieportal
TIA Selection Tool Cloud (TST Cloud), **see** www.siemens.com/tstcloud/?node=SIRIUSRelais
Conversion tool, **see** www.siemens.com/conversion-tool
Catalog IC 10, **see** www.siemens.com/ic10
Brochure for SIRIUS relays, **see** https://support.industry.siemens.com/cs/ww/en/view/109766469

SIRIUS relays – one range for every application

Our range of SIRIUS relays offers everything you need for motor feeder applications. Easy and convenient. From a single source. Whether you require compact timing relays or reliable monitoring relays, particularly narrow coupling relays, plug-in relays, or signal converters – our relay range is the most complete and comprehensive portfolio on the market. Quite simply, there is one for every possible need. What is more: all SIRIUS relays are particularly easy to use. So take a closer look at our product range and see for yourself. You'll be surprised.

SIRIUS 3UG, 3RR, 3RN, 3RS monitoring relays – reliable monitoring and protection

SIRIUS relays from Siemens offer maximum protection for machines and plants and communicate with the control level via IO-Link. The SIRIUS relays for IO-Link reliably monitor network quality, current values, voltages, speeds and temperatures, and at the same time they open up an even wider field of applications for you.

3UG monitoring relays are used to monitor electric and non-electric variables which cannot (or should not) be directly recorded by an automation system.

- Monitoring of networks for overvoltage or undervoltage, direction of rotation, frequency, or asymmetry
- Monitoring of loads through power factor, power or current measurement
- Monitoring for insulation faults and residual currents
- Monitoring of levels or speeds

The **3RR current monitoring relays** are suitable not only for monitoring motors or other loads, but are also well suited for monitoring multi-phase currents of the entire plant or the driven process. In this way, for example, an idling pump or an overload is promptly detected and reported in good time. The 3RR2 monitoring relays can be set up individually or integrated directly into the load feeder.

3RN thermistor motor protection relays monitor the winding temperature of motors fitted with a PTC sensor.

Overview (continued)

- Compliance with the ATEX Directive 2014/34/EU through conformity with the EN 50495 and EN 60947-8 standards
- Compliance with the safety requirements for PL c according to ISO 13849-1 or SIL 1 according to IEC 62061
- Fast fault diagnostics through display of open circuits and short circuits
- Solid-state compatible output due to hard gold-plated contacts

3RS2 temperature monitoring relays can be used to measure temperatures in solid, liquid and gas media. The temperature is acquired by sensors in the medium, evaluated by the device, and monitored for overshoot, undershoot, or to ensure that it remains within an operating range (window function).

The family comprises an analog multi-function device which can be set using DIP switches and potentiometers, and digital devices which can be parameterized via an intuitive LCD. The digital device is also available as a version with IO-Link.

All 3RS26 digital devices, including the 3RS28 versions with IO-Link, come with Safety certification according to IEC 62061 or ISO 13849-1 up to SIL 1/PL c as well as EN 14597 for heat generating systems and EN 50156 for burners.

Furthermore, the functionality of the 3RS26/3RS28 digital devices can be expanded using a 3RS29 sensor expansion module with two additional resistance sensors, e.g. for monitoring three-phase motors or transformers.

The 3RS29 sensor expansion module also features an additional relay for outputting the sensor status, and an additional analog input 4 to 20 mA. The 3RS29 is connected wirelessly via a SIL 1-certified infrared communications interface.

SIRIUS speaks IO-Link

With the SIRIUS monitoring relay for IO-Link you are opting for maximum flexibility: As well as the autonomous monitoring function that is still available, measured values and data can also be transferred directly to the controller via IO-Link. Parameterization can also be performed either locally or via IO-Link. This means that the SIRIUS relays for IO-Link are fully integrated into Totally Integrated Automation, our open system architecture for end-to-end automation. You also profit from significantly simplified device replacement – thanks to data matching and automatic reparameterization via a parameter server.

SIRIUS 3RP, 7PV timing relays

Electronic timing relays are used in control, starting, protective, and control circuits for all switching operations involving time delays.

Due to their sophisticated and compact design, the 3RP timing relays are ideal timer modules for control cabinet, switchgear and controller manufacturers in the industrial sector. Due to their narrower design, the 7PV timing relays are particularly suitable for use in heating, ventilation and air-conditioning systems and compressors.

SIRIUS 3RA28 function modules and solid-state time-delay auxiliary switch blocks

The 3RA281. function modules enable the assembly of starters and contactor assemblies for direct-on-line and star-delta (wye-delta) starting. They include the key control functions required for the particular feeder, e.g. timing and electrical interlocking function. The function modules that function as timing relays are mounted quickly and simply on SIRIUS contactors – without any great wiring effort. They enable both ON-delay and OFF-delay switching of contactors.

The 3RA283. solid-state time-delay auxiliary switch blocks, which can be mounted on contactors, are designed for contactor coil voltages in the range from 24 to 240 V AC/DC (wide voltage range). Auxiliary switches for control and alarm signals are used specially for switching the smallest signals for electronics applications. They are used, for example, for allowing a pump or fan to run on, similar to an OFF-delay timing relay or for the delayed activation of a gate

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Overview (continued)

drive. Both the electrical and mechanical connection are made by simple snapping on and locking. A varistor is integrated in the time-delay auxiliary switch to attenuate contactor coil switching overvoltages.

SIRIUS 3RQ1, 3RQ2, 3RQ4 and LZS coupling relays

The SIRIUS coupling relays are ideally suited for coupling to and from controllers, making them the perfect choice for SIMATIC controllers. They can be used for electrical separation, voltage conversion, signal amplification as well as overvoltage and EMC protection.

The force-guided **3RQ1 coupling relays** (up to SIL 3/PL e) are available in widths of 17.5 mm and 22.5 mm. In accordance with the force-guided operation specified in IEC 60947-5-1 (IEC 61810-3), the contacts of the installed relays are connected to each other so that NO contacts and NC contacts are never closed at the same time. In this way, opening failures are reliably detected and maximum safety is ensured. 3RQ1 coupling relays serve to reliably couple safe controllers, also for safety applications up to SIL 3/PL e.

The universally applicable **3RQ2 coupling relays** set standards: With a wide voltage range from 24 to 240 V AC/DC, they are the star attraction on the coupler market. The reduced variety of devices simplifies product selection and standardization. In this series, we offer devices in the proven 22.5 mm industrial enclosure, featuring one, two or three changeover contacts, as well as screw and spring-loaded terminals (push-in connection). The versions with hard gold-plated contacts ensure exceptionally high contact reliability, even at low currents. Thanks to the tried and tested industrial enclosure, you can enjoy the benefits of user-friendly connection systems with permanent wiring, just as with our timing relays.

The new **3RQ4 coupling relays** set new standards in sustainability, innovation, and quality. The design is based on SIMATIC controllers. The relays feature a fully sustainable design, are made from 80% bio-based plastic, and are manufactured entirely in Germany. With a width of just 6.2 mm, they are ideal for space-optimized installation in control cabinets with narrow tier spacing or in flat control boxes. All versions are available with screw and spring-loaded terminals (push-in technology). The wire inlet and front-side clamping option reduce wiring times.

3RQ4 coupling relays are available as:

- Coupling relays with relay output
- Coupling relays with plug-in relay
- Coupling relays with semiconductor output

The right choice depends on the respective area of application.

The coupling relays with relay output have ATEX, railway and marine approval. The fixed connection of the relays makes them more rugged in harsh environmental conditions.

Coupling relays with plug-in relay are perfect for standard applications. The relays used can be replaced during operation.

A highlight of the 3RQ4 portfolio are the semiconductor variants. These are the perfect choice for a wide range of applications. Due to their virtually unlimited service life and ultra-fast, reliable switching operations, they can significantly reduce maintenance costs. Even if a standard relay needs to be replaced just once, a solid-state coupling relay is usually more cost-effective.

LZS coupling relays with plug-in relays are available as complete units or as single modules for customer assembly or as spare parts in the RT and PT designs.

- Can be used for contact multiplication, adaptation of potential, or for switching small loads
- Max. four changeover contacts in one device:
  - Wide-voltage versions with or without hard gold-plated contacts
  - With screw or push-in spring-loaded terminals

Overview (continued)

SIRIUS 3RS70 signal converters

The 3RS70 signal converters feature the same enclosure concept as the 3RQ4 coupling relays. They are mainly used for the electrical separation and conversion of analog signals. Sensors/actuators and controllers generally have different potentials and therefore require electrical separation in the signal circuit. This is either integrated in the controller or is implemented using signal converters.

A signal has to be converted into another signal if, for instance, a voltage signal needs to be converted into a current signal for transmission over a long distance, or if the output of a sensor and the input of a controller are not compatible with one another.

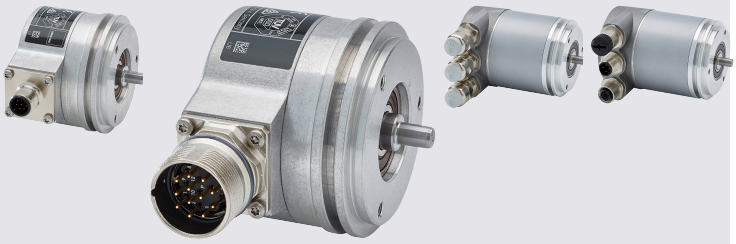
The implemented frequency outputs offer another application. In this case, the input signal is converted into a proportional frequency. This means that analog signals can be processed with digital inputs.

This is important if the controller does not have any provisions for an analog input, or if all of its analog inputs are already assigned, e.g. when devices are retrofitted.

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Overview

Motion Control Encoder measuring systems

Encoder type	Incremental encoders			Absolute encoders				
								
Interface	sin/cos 1 V_{pp}	RS422 (TTL)	HTL	DRIVE-CLiQ	SSI	EnDat 2.1	PROFIBUS DP-V2	PROFINET IO with RT/IRT
Resolution	1000 S/R 1024 S/R 2500 S/R	500 S/R 1000 S/R 1024 S/R 1250 S/R 1500 S/R 2000 S/R 2048 S/R 2500 S/R 3600 S/R 5000 S/R	100 S/R 500 S/R 1000 S/R 2500 S/R	Single-turn 24-bit Multiturn 36-bit (2^{24} steps × 4096 revolutions)	Single-turn13-bit (8192 steps) Multi-turn 25-bit (8192 steps ×4096 revolutions)	Single-turn13-bit (8192 steps) Multi-turn 25-bit (8192 steps ×4096 revolutions)	Single-turn13-bit (8192 steps) Multi-turn 27-bit (8192 steps ×16384 revolutions)	Single-turn13-bit/16 bit (8192/65536 steps) Multi-turn 27-bit/30 bit (8192/65536 steps ×16384 revolutions)
Catalog	D 21.4							

Motion control encoders are optoelectronic built-on encoders that detect the traversing distances, angles of rotation, speeds or positions of machine axes. Motion control encoders are direct measuring systems that are built-on to shafts, axes or motors. They can be used in conjunction with numerical and programmable logic controllers, drives and position displays. Motion control encoders are system-tested, certified components that have been harmonized for use with the following systems:

- SINUMERIK CNC controls
- SIMATIC programmable logic controllers
- SINAMICS drive systems

Motion control encoders are used with machine tools and production machines as additional external measuring systems. They are available as incremental or absolute encoders.

- In the case of incremental encoders, the machine must travel to a reference point after each power-off state, as the position is not usually stored in the controller. Movements of the machine while the power is off are not recorded. Incremental encoders are suitable for use in simple machine concepts with mostly small dimensions.
- Absolute encoders, on the other hand, also record movements while the power is off and return the actual position after power on. Travel to a reference point is not necessary. Absolute encoders are suitable for complex machines or machines with large dimensions.

All motion control encoders are available as Synchro flange and clamp flange versions. The absolute encoders are also available with a hollow shaft and torque arm.

The motion control encoders are driven via a plug-in coupling or spring disk coupling. Alternatively, pulleys can also be used.

The motor control encoder supply voltage is 5 V DC or alternatively 10 V to 30 V DC. The 10 V to 30 V DC version supports longer cable lengths. Most control systems supply the voltage directly at the measuring circuit connector. With SINAMICS, the measuring systems are provided with power via the Sensor Modules.

For motion control encoders with cables, the cable length including the connector is 1 m.

The following bending radii must be observed for the cable to the built-on encoder:

- One-time bending: ≥ 20 mm
- Continuous bending: ≥ 75 mm

More information

- Catalog D 21.4

- Internet:
  www.siemens.com/sensor-systems
  www.siemens.com/d21-4
  https://sieportal.siemens.com

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Overview



SINUMERIK 828D – the powerhouse among the compact CNCs

With their unique CNC performance, SINUMERIK 828D CNCs set productivity benchmarks when it comes to milling and turning on standard machines as well as functions for easy automation of grinding machines. With new SINAMICS drives and SIMOTICS motion control motors SINUMERIK 828D is now even more productive.

Rugged and maintenance-free

An operator panel front of die-cast magnesium, the panel-based CNC design with minimal interfaces and the high degree of protection on the front of the PPU make the SINUMERIK 828D CNCs reliable partners even in harsh environments.

Designed without a fan or hard disk, with NVRAM memory technology and no back-up battery, SINUMERIK 828D CNCs are completely maintenance-free.

User-friendly

The SINUMERIK 828D CNCs are easy to operate thanks to a full QWERTY CNC keyboard with short-stroke keys and a high-resolution 12.1" TFT color display or 15.6" touch display.

CNC data are quickly and easily transferred via the USB 3.1 interface on the operator panel front.

Optimum scalability

Based on the three CNC performance versions SW 24x, SW 26x and SW 28x of the SINUMERIK 828D CNCs, favorably-priced compact and also complex machines with additional axes/spindles as well as up to 2 machining channels and 2 handling channels can be implemented.

Digital twin

Create MyVirtualMachine and/or Run MyVirtualMachine minimize setup and run-in times, reduce collision hazards and speed up program optimization. Increased productivity and safety - even before the actual machine starts.

More information

- Internet:
  sieportal.siemens.com
  www.siemens.com/sinumerik-828
  www.siemens.com/nc82
- For full details of SINUMERIK 828, please refer to SiePortal:
  https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10078797

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Overview



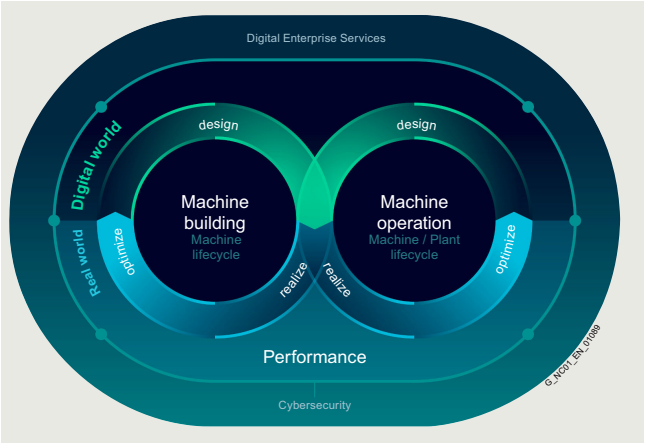
SINUMERIK ONE: the next level CNC in the premium class

SINUMERIK ONE – the digital native CNC with the pioneering CNC system for highly productive machine tools. Thanks to its digital twin, the key element in digital transformation, SINUMERIK ONE helps to simulate and test work processes completely virtually.

Boosting productivity with SINUMERIK and digitalization solutions

Shorter product introduction times and increasing individualization of products influence production with machine tools. High productivity is more important than ever for machine manufacturers and users. The key factor is optimum interaction of automation and CNC solutions and sophisticated technology – and the effective integration of digital solutions. This applies to all areas: from design and construction of a machine to operation and service. SINUMERIK connects automation, competence in technology, and digitalization to form a single solution offering for more productivity. SINUMERIK CNC systems are the optimum solution for the production of individual parts or series production, for simple or complex workpieces.

Benefits



Merging the real world with the virtual world

The new SINUMERIK ONE is specifically designed for smart manufacturing.

- The digital twin is an integral part of the CNC system; virtual and real CNC merge and complement each other
- Significant reduction [1] in product development and market launch times thanks to the **digital first** strategy
- Improved networking and data communication capabilities
- Significant reduction [1] in the duration of real commissioning thanks to virtual commissioning preparation
- Significantly increased CNC performance
- Significantly shorter downtimes [1] and complete integration into the TIA Portal thanks to the integrated SIMATIC S7-1500F PLC

This means that the SINUMERIK ONE can be seamlessly integrated into digital solutions and workflows.

[1] Actual savings depend on the specific application.

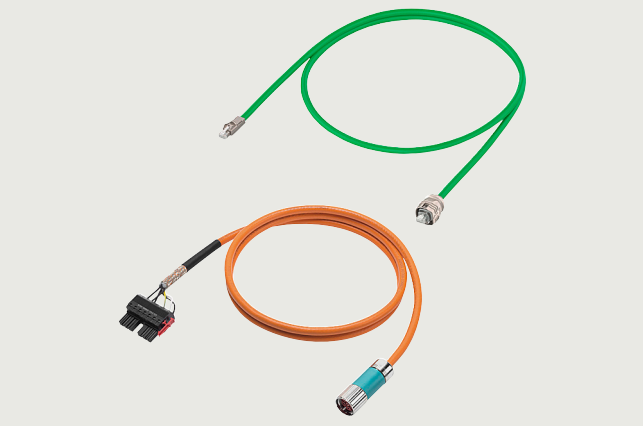
More information

- Internet:
  sieportal.siemens.com
  www.siemens.com/sinumerik-one
  www.siemens.com/nc63
- For full details of SINUMERIK ONE, please refer to SiePortal:
  https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10028455

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Overview

MOTION-CONNECT includes connection systems and components which are optimally tailored to individual areas of application. MOTION-CONNECT cables feature state-of-the-art connection systems to ensure fast, reliable connection of different components, and offer maximum quality as well as system-tested reliability.



MOTION-CONNECT power cable and signal cable

MOTION-CONNECT cables are available as fully-assembled power and signal cables or sold by the meter. The pre-assembled cables can be ordered in length units of 10 cm (3.94 in) and can be extended, if necessary.

Whatever your machine requirements, MOTION-CONNECT offers the solution.

- **Robust, high-performance and easy to use**
  thanks to pre-assembled cables with a rugged metal connector in degree of protection IP67 and reliable SPEED-CONNECT quick-release lock
- **Outstanding and proven quality**
  achieved by consistent quality management and system-tested cables

Cables are available in two different qualities – MOTION-CONNECT 500 and MOTION-CONNECT 800PLUS.

MOTION-CONNECT 500	MOTION-CONNECT 800PLUS
• Cost-effective solution for predominantly fixed installation • Suitable for low mechanical loading • Tested for travel distances up to 5 m (16.4 ft)	• Meets requirements for use in cable carriers • Suitable for high mechanical loading • Oil resistance • Tested for travel distances of up to 50 m (164 ft)

More information

- Catalog D 21.4

- Internet:
  www.siemens.com/motion-connect
  www.siemens.com/d21-4
  sieportal.siemens.com

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16/2	**Training Services**
16/2	SITRAIN
16/5	**Additional documentation**
16/5	SIMATIC Manual Collection
16/6	**Standards and approbations**
16/6	Standards and approbations, quality management
16/7	**Siemens Automation Cooperates with Education (SCE)**
16/7	Teaching made easy - Comprehensive support on the way to Industry 4.0
16/11	**Partner at Industry Automation and Drive Technologies**
16/11	Siemens Partner Program
16/13	Partners
16/14	**Service**
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16/15	**Software licenses**
16/15	Information on software licensing
16/16	**Sale and delivery**
16/16	Conditions of sale and delivery

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Overview



Lern the way you like it – with SITRAIN

SITRAIN provides comprehensive technical knowledge for a wide range of industries and applications. Its offering is consistently aligned with the needs of learners and the requirements of innovative companies. Benefit from modern learning methods, personalized support, and practical knowledge that sustainably enhances your daily work and professional development. SITRAIN stands for successful, flexible, and continuous learning.

Education and training directly from the manufacturer

SITRAIN offers high-quality training covering Siemens' industrial product and solution portfolio and has more than 30 years of experience in technical training. Discover the wide range of opportunities to expand your expertise and find the course that perfectly fits your needs.



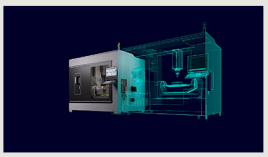
Industrial Automation Systems SIMATIC

Training available for:
SIMATIC S7-1200/S7-1500. TIA Portal,
SIMATIC S7-300/400



Drive Technology

Training available for:
SINAMICS S120, S210,
SINAMICS G120, G220,
SINAMICS G130/G150/S150,
SINAMICS G180,
SINAMICS DCM



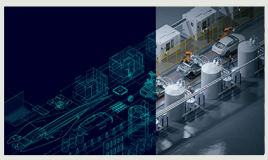
SINUMERIK CNC automation system

Training available for:
SINUMERIK 840D,
SINUMERIK 840D sl and
SINUMERIK ONE



Process Control Systems

Training available for:
SIMATIC PCS 7,
SIMATIC PCS neo



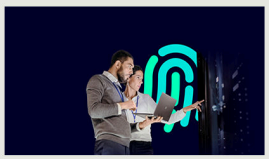
Digital Enterprise

Training available for:
Openness, SIMIT, OPC UA,
Industrial Edge,
virtual commissioning



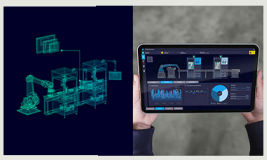
Industrial Communications

Training available for:
OPC UA, PROFINET, SCALANCE, RUGGEDOM, Industrial Ethernet, Remote Communication



Cybersecurity

Training available for:
Industrial security for factory and process automation,
SINEC Security Software Suite and IT/OT security for industrial networks



Operator Control and Monitoring Systems

Training available for:
SIMATIC WinCC Unified in TIA Portal, SIMATIC WinCC in TIA Portal, SIMATIC WinCC V8



Motion Control

Training available for:
SIMATIC Motion Control and SIMOTION



Smart Infrastructure

Training available for
SIRIUS, SENTRON, SIVACON, ALPHA, SIMOCODE and circuit breakers



Process Analytics & Instrumentation

Training is available for process analytics and instrumentation and explosion protection



Additional training offer

SIMOVE with automated guided vehicles (AGV), cranes, guidelines and standards for control cabinets

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Overview (continued)

Different learning formats and methods for maximum learning success

With SITRAIN trainings, you can shape your further education according to your individual preferences and the demands of your professional routine. You have the option to choose between online training and classroom courses – depending on which format suits you best.

In addition, you decide whether to complete your training flexibly on demand or attend scheduled sessions.

Whether with a learning consultant, as part of a team, or through self-paced learning – SITRAIN offers maximum flexibility and tailored options for your learning process.

Discover our three learning formats:

Learning Event



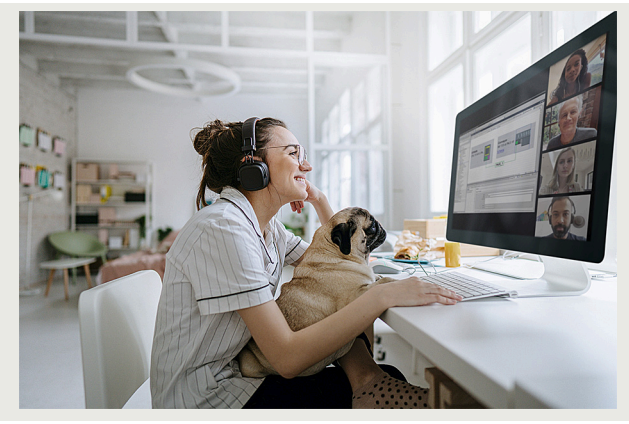
SITRAIN Learning Events are the perfect choice to achieve a defined learning goal in the shortest possible time. You learn in a protected learning environment outside of the daily work routine under the guidance of a learning consultant – virtually, in the training center, or at your company.

Learning Membership I SITRAIN access



SITRAIN access is a digital learning platform where knowledge is delivered through modular content such as tutorials, presentations, exercises, and tests. Learners benefit from a growing course offering as well as the Siemens Virtual Lab, where they can deepen their knowledge in a practical way – without the need for installation. Learn anywhere, anytime, flexibly and online.

Learning Journey



The Learning Journey is the perfect combination of virtual live sessions with a learning consultant and self-learning modules for sustainable learning success. The modular approach enables an easy integration of learning into your daily work. This also includes access to the digital learning platform, SITRAIN access, for one year.

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Overview (continued)

Live
Learn together with others, simultaneously and guided by a learning consultant. Online, in the SITRAIN training center or at your company.

Self-reliant
Expand your knowledge self-determined with industry learning and work on your learning units at your own pace and according to your own schedule.

On demand
Get the knowledge you need, exactly when you need it. Be it to answer a current question or to work on a special topic.

Individual
Talk directly with the learning consultant, clarify detailed questions and get personal coaching for transferring the learned topics to your own application.



More information
https://www.siemens.com/sitrain
Course booking
https://sitrain.siemens.com
Training cases
https://www.siemens.com/sitrain-catalog-training-cases

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Overview

All manuals for SIMATIC offline in 5 languages

- Keyword search within PDF file
- Search across all manuals
- Electronic update service, free for 1 year
- Network-compatible, i.e. saving of PDFs on central server

Content

The SIMATIC Manual Collection comprises the electronic manuals as PDF file for:

- S7-1200
- S7-1500
- S7-200
- S7-300
- S7-400
- LOGO!
- SIMATIC DP
- SIMATIC PC
- SIMATIC PG
- STEP 7
- Engineering software
- Runtime software
- SIMATIC HMI
- SIMATIC NET
- SIMATIC IDENT

Selection and ordering data

SIMATIC Manual Collection download 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	**6ES7998-8XE01-8YE0**
SIMATIC Manual Collection Software Update Service (SUS) download 5 languages Within the scope of this contract, you will receive all software versions as download for one year. The contract is automatically extended for 1 year unless canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	**6ES7998-8XE01-8YE2**

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Overview

The electronic products described in this catalog comply with the requirements and protection objectives of the following EU directives insofar as they relate to the product concerned. They also comply with the corresponding harmonized European standards (EN) published for these products in the Official Journals of the European Community.

- 2014/35/EU "Electrical equipment designed for use within certain voltage limits" (Low Voltage Directive))
- 2014/30/EU "Electromagnetic Compatibility" (EMC Directive)
- 2014/34/EU "Equipment and protective systems intended for use in potentially explosive atmospheres" (Explosion Protection Directive)
- 2011/65/EU "Restriction of the use of certain hazardous substances in electrical and electronic equipment" (RoHS Directive)
- For F-modules, the following also applies: 2006/42/EC "Machinery Directive"

The originals of the declarations of conformity are kept available by us for the responsible supervisory authorities.

They are also available for download on the Siemens Industry Online Support website (https://sieportal.siemens.com), keyword "Declaration of Conformity".

Note on the EMC Directive:

SIMATIC-Produkte sind bezüglich der Störaussendung ausgelegt für den Einsatz im Industriebereich. In terms of their interference emissions, SIMATIC products are designed for industrial applications.

If individual products deviate from this specification, it is noted in the catalog with the products.

The installation instructions in the manuals must be adhered to when installing and operating the products described in this catalog. These contain, for example, important information on installation in cabinets and on the use of shielded cables.

Notes for machine manufacturers

The SIMATIC automation system is not a machine within the context of the EU machine guidelines. Therefore a declaration of conformity with regard to the EU machine directive 89/392/EEC or 2006/42/EU (new edition, applicable from end of 2009) may not be provided for SIMATIC.

The EU machine directive regulates the requirements placed on a machine or a part thereof. A machine is understood for the purposes of this guideline to be a combination of interconnected parts or mechanisms (see also EN 292-1, Paragraph 3.1).

SIMATIC is part of the electrical equipment of a machine, and must therefore be integrated into the evaluation of the complete machine by the machine manufacturer.

As electrical equipment, SIMATIC is subject to the low-voltage directive which, as a "total safety directive", covers all dangers just like the machine directive.

The EN 60204-1 standard (safety of machines, general requirements for the electrical equipment of machines) is applicable to the electrical equipment of machines.

The following table will help you in the provision of your declaration of conformity, and shows which criteria according to EN 60204-1 (2006-06) apply to SIMATIC. You can obtain further information from the enclosed declaration of conformity according to the low-voltage and EMC directives (with list of included standards).

Overview (continued)

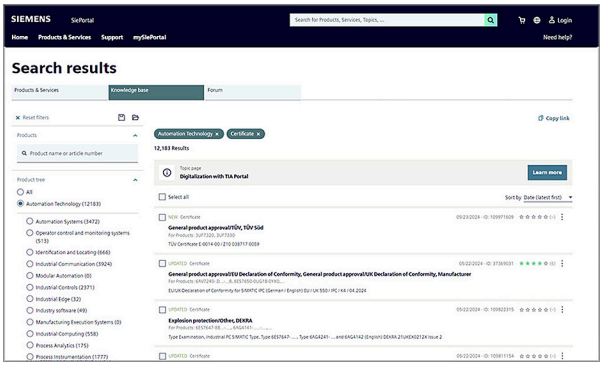
EN 60204-1	Topic/criterion	Notes
Paragraph 4	General requirements	The requirements are met when the equipment is assembled/ installed in accordance with the installation guidelines. Please note the relevant information in the manuals.
Paragraph 11.2	Digital input/output interfaces	The requirements are met
The requirements are met	Paragraph 12.3	The requirements are met when the equipment is installed in lockable cabinets to protect against alteration of the memory contents by unauthorized persons
Paragraph 20.4	Voltage tests	The requirements are met

Certificates, authorizations, approbations, declarations of conformity

An overview of the certificates available for SIMATIC products (CE, UL, CSA, FM, shipping authorizations) can be found in the internet under this link.

The lists are continously updated. The data for products which have not yet been included in the overview is continously collected and prepared for the subsequent edition.

You can also find certificates, approbations, verification certificates or characteristic curves under Product support "Entry list"



Quality management

The quality management system of the Siemens Operating Company Digital Industries, Business Unit Factory Automation, complies with the international standard ISO 9001.

The products and systems described in this catalog are sold under application of a quality management system certified by DQS in accordance with DIN EN ISO 9001.

The DQS certificate is recognized in all IQ Net countries.

DQS Registered Certificate No.:

Siemens AG

- DI FA
  Reg.-Nr.: 001323 QM15

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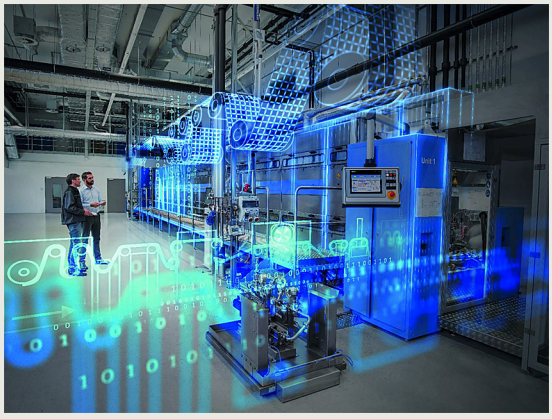
Overview

Knowledge & technology – the keystones to success in digitalization



Digitalization is quickly and radically changing our world. What does this mean for education?

In the world of Industry 4.0, companies can expect a host of new opportunities and challenges. New systems are verified on the spot through simulations. Automated mass production processes can make every product on the conveyor belt a unique product.



New products are now market-ready much faster. Siemens is shaping this transformation as a technology leader in the field of automation and process lifecycle management (PLM).

These new digitalization processes are changing the know-how requirements for employees. Many educational institutions are facing the challenge of conveying Industry 4.0 know-how as part of their teaching and training. The Siemens Automation Cooperates with Education (SCE) program is supporting educators on the way to Industry 4.0.

The SCE digitalization concept for educators

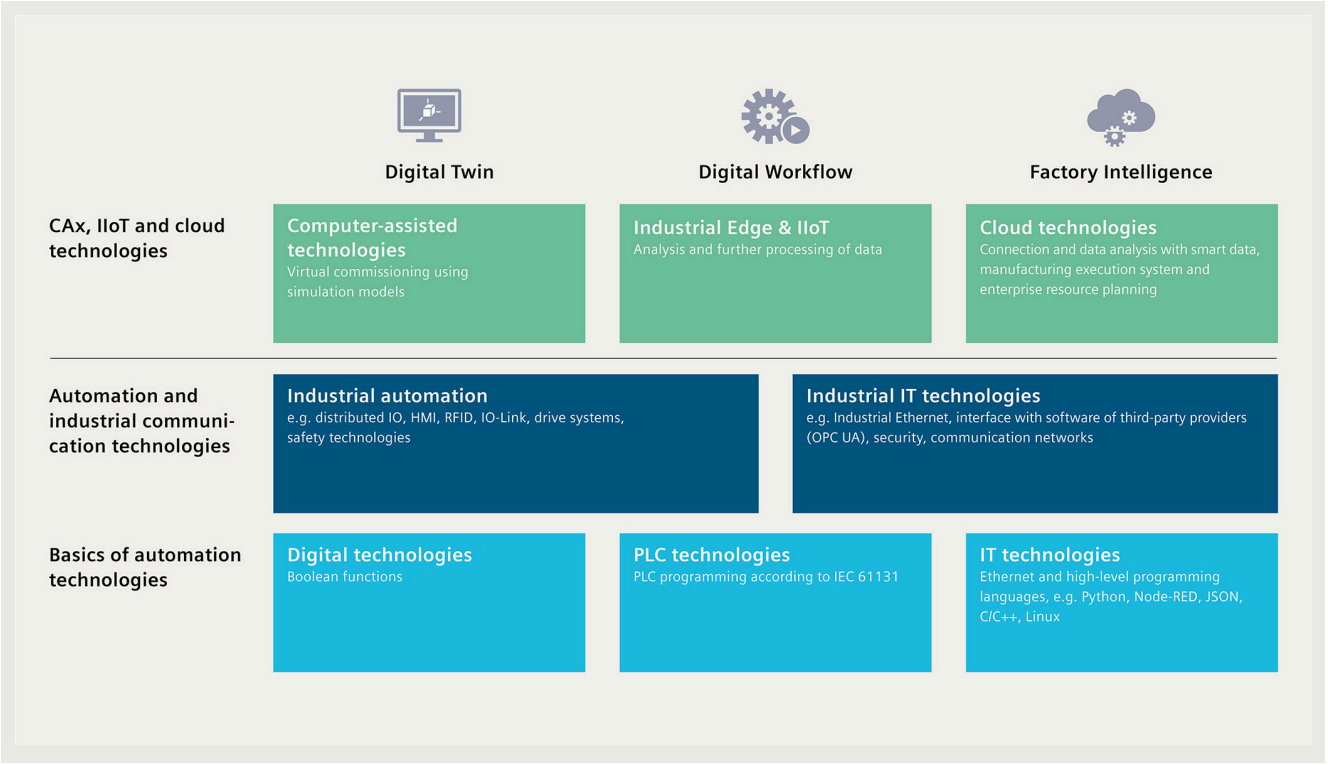
The SCE digitalization concept presented here shows how digitalization can be implemented in educational institutions – from vocational schools to universities.

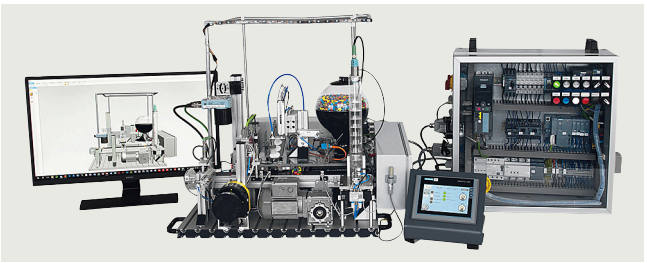
Digitalization (or Industry 4.0) know-how is now introduced through computer aided technology, Industrial Edge and IIoT as well as Cloud technologies. It is founded on the basics of automation, such as digital technologies, PLC and information technologies, and on advanced automation and industrial communication technologies.

The level of digitalization knowledge can be weighted, depending on the vocational field or branch of study –
e.g. mechanical engineering, automation engineering or computer science.

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Overview (continued)





As part of their project work, students at Vocational School 2 in Wolfsburg, Germany, have implemented the three levels of the SCE Industry 4.0 concept. A virtual twin created with the Siemens NX Mechatronics Designer (MCD) CAD software was used for the design and virtual commissioning. This enables fast and efficient assembly of the real automation system, e.g. with SIMATIC S7-1500/ET 200SP/RFID, for use in classes. Production data, such as the number of bottles filled, production date and system parameters, are uploaded to a cloud using SIMATIC IOT2000.

Please find further information under this link and this link.

The SCE offers

Learning and training documents



More than 100 didactically prepared learning and training documents are available through SCE and incorporate the digitalization concept. They are designed for use in classes, but can also be customized or used for individual study. These documents are available for free download, most of them in 7 languages.

Please find further information under this link.

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Overview (continued)

Trainer packages



The 90 SCE trainer packages help educators teaching and implementing the SCE digitalization concept. Trainer packages comprise specially compiled, genuine Siemens hardware and software products. The trainer packages are based on the learning and training documents and are offered to schools, colleges and universities at special terms.

Please find further information under this link.

Educator courses

Excellent teaching content is needed to introduce students to digitalization. For this purpose, SCE holds educator courses in certain regions. Based on our learning and training documents and through practical exercises, educators acquire the latest Industry 4.0 know-how.

Please find further information under this link.

Support for your projects / textbooks

We support you on selected projects with advice and assistance from SCE contact partners.

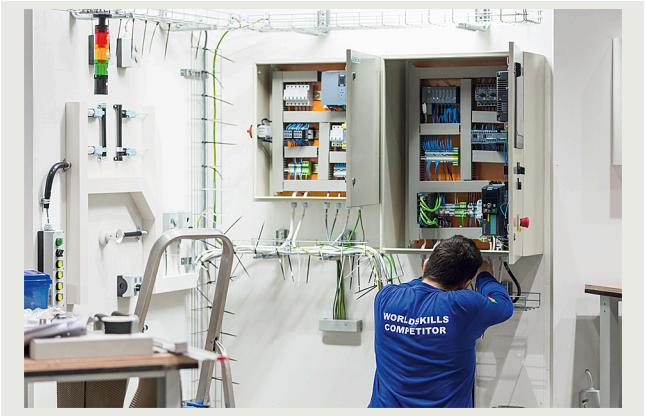
As a special service, we support textbook authors. We maintain a list of textbooks on the SCE website

Please find further information under this link und this link.

Partnerships for proliferation of Industry 4.0 in education

Partnership with WorldSkills





As a technology powerhouse, we support vocational training of students around the world. Since 2010, we have partnered with WorldSkills as a Global Industry Partner in order to amplify this cause.

WorldSkills is an international organization whose mission is to raise the profile and recognition of skilled people, and show how important vocational skills are in achieving economic growth and personal success. Every two years, WorldSkills hosts the world championships of skills.

Siemens provides the competitors with automation products, such as SIMATIC S7-1500 and LOGO!, for the disciplines: industrial control, electrical installations, Polymechanics/Automation and manufacturing technology.

Additionally, we support selected continental and regional competitions.

Please find further information under this link.

Partnerships with educators

We provide support to educators and educational organizations in the form of one-on-one advice through SCE contact partners and Siemens experts as well as long-term cooperation.

Please find further information under this link.

Partnerships with producers of learning systems

For practical training in classrooms and labs, numerous producers of learning systems offer a wide range of complete didactic solutions based on SCE trainer packages

Please find further information under this link.

Information portal



To facilitate your teaching assignment and/or for selfstudy, we offer educators and students a comprehensive SCE information portal. At this portal you have quick access to all SCE offers, e.g. learning and

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Overview (continued)

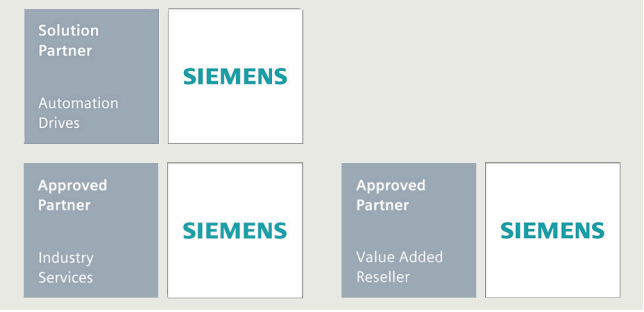
training documents including projects, Getting Started information, videos, manuals, trial software and newsletters.

Please find further information under this link.

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Overview

Siemens Solution and Approved Partners – Helping you to success



Superior competence in automation and drive technology

Siemens works in close collaboration with selected partner companies worldwide to ensure that the automation and drive technology requirements of its customers are complied with to the greatest extent possible – at all times and in any location.

We place great value on our customers acting in accordance with the same ideals which characterize Siemens as a whole: Competence, professionalism and quality. That is why continuous development through qualification and certification measures in line with global standards is a central aspect of our Partner Program. This means that with our partners, you benefit from the same high quality standards all over the world. The partner emblem is the symbol for tried and tested quality.

The partner network for industry

Competence and experience in your region: Provided by the Siemens Partner Program.

We work with both Solution Partners and Approved Partners within the context of our global network. At present we cooperate with more than 1,500 Solution Partners around the world. And we continue to expand our network of over 150 Approved Partners in more than 80 countries worldwide.

Siemens Solution Partner – Automation Drives



At present we cooperate with more than 1,500 **Solution Partners** around the world. They are characterized by extensive application, system and sector knowledge, as well as proven project experience, and are able to implement future-proof tailored solutions of the highest quality, based on our product and system portfolio.

Overview (continued)

Siemens Approved Partner – Value Added Reseller



With their detailed technical knowledge, **Siemens Approved Partners – Value Added Resellers** offer a combination of products and services that range from specialist technologies and customized modifications to the provision of high-quality system and product packages. They also provide qualified technical support and assistance.

Siemens Approved Partner – Industry Services



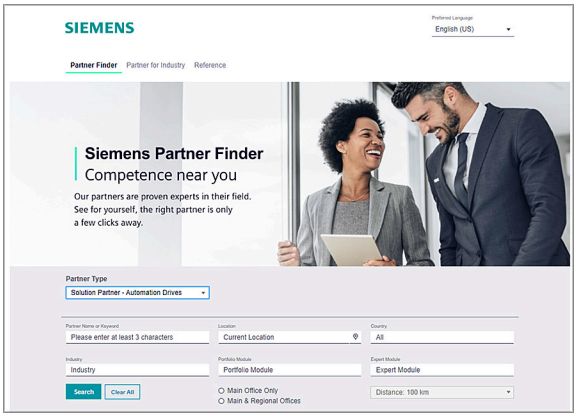
Siemens Approved Partner – Industry Services: put their unique expertise entirely at the service of enhancing your productivity and can be instrumental in ensuring the availability of your plants.

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Overview (continued)

Partner Finder

Just a few clicks away from the ideal partner for your task!



Partner Finder

In the Siemens global Solution Partner program, customers are certain to find the optimum partner for their specific requirements - with no great effort. The Partner Finder is basically a comprehensive database that showcases the profiles of all our solution partners.

Easy selection:
Set filters in the search screen form according to the criteria that are relevant to you. You can also directly enter the name of an existing partner.

Skills at a glance:
Gain a quick insight into the specific competencies of any particular partner with the reference reports.

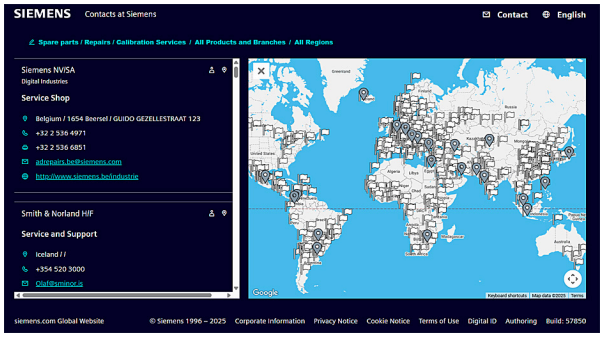
Direct contact option:
Use our electronic query form under this link.

More information regarding Siemens Partners for industry is available from the Internet under this link.

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Overview

Partners at Siemens



At your service locally, around the globe for consulting, sales, training, service, support, spare parts on the entire portfolio of Siemens.

Your partner can be found in our Personal Contacts Database at: www.siemens.com/automation-contact

You start by selecting the required competence, products and branches, a country and a city or by a location search or free text search.

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Overview



At Digital Enterprise Services, we provide you with comprehensive services throughout the entire lifecycle. From a fully digital factory to a reliable spare parts supply and quick support in the event of outages, we work with our partners to ensure your plant operates optimally – improving availability, productivity, and efficiency.

Our services take industry to the next level and give you a competitive edge:

- **Industrial Digitalization Services:**
  Accelerate your digital transformation with our Digitalization Services. Our scalable offerings combine the real and digital worlds by delivering value through IT/OT solutions, improved Overall Equipment Effectiveness (OEE), advanced AI, predictive maintenance and robust cybersecurity while keeping you ahead of competition.
- **Industrial Sustainability Services:**
  Our services include data-driven energy consumption analyses and measures to extend equipment lifespan. Specific savings potential is system-specific and determined individually. Siemens makes no blanket commitments regarding CO_2 reductions or the customer's sustainability targets.
- **Industrial Lifecycle and Training Services:**
  Our tailored Lifecycle Services deliver expert maintenance and support worldwide, enhancing the availability and performance of your industrial assets throughout their lifecycle – from individual machines and systems to entire plants or factories. In addition, our flexible and future-oriented training offerings for all industries and applications empower you to get the most out of your investments.

For more information, please visit us at
Industrial Digitalization Services
Industrial Sustainability Services
Industrial Lifecycle and Training Services

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Overview

Software types

Every software subject to a license is assigned to a type.
The following software types are defined:

- Engineering software
- Runtime software

Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning, or servicing. Data generated with Engineering software or executable programs can be duplicated for your own use or for use by third parties free-of-charge.

Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.
The duplication of the Runtime software or executable programs created with the Runtime software for your own use or for use by third parties is subject to a charge. You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.
Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery of the Runtime software can be found in the accompanying readme files.

License types

Siemens Digital Industries and Smart Infrastructure offers different types of licenses for software:

- Floating license
- Single license
- Rental license
- Trial / Demo license

Floating license

The software may be installed by the licensee for internal use on up to 10 times as many Instances as it has purchased licenses for objects (e.g., users or devices) specified in the Order. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started. One license is required for each concurrent user.

Single license

Unlike the floating license, only one installation of the software is permitted per license. The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include, for example, per instance, per axis, per channel, etc.
One single license is required for each type of use defined.

Rental license

The rental license supports the "temporary use" of Engineering software. Once the license key has been installed, the software can be used for a defined time (the operating hours do not have to be consecutive). One license is required for each installation of the software.

Trial /Demo license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Certificate of License (CoL)

The CoL is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Overview (continued)

Available versions

Software is constantly being updated. The delivery versions

- PowerPack
- Upgrade

can be used to access these updates.
Existing bug fixes are supplied with the ServicePack delivery version.

PowerPack

PowerPacks are conversion packages used to upgrade to more powerful software.

The licensee receives a new license agreement and Certificate of License (CoL) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.
A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade

An upgrade allows a newer, available version of the software to be used under the condition that a license for a previous version has already been acquired. The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous version, proves that the new software is licensed.
A separate upgrade must be purchased for each original license of the software to be upgraded.

ServicePack

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Digital Industries and Smart Infrastructure offers software products with and without license keys.
The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.)
The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Software Update Service (SUS)

Within the framework of the SUS contract, you are provided with the software and latest license for the relevant product at no cost over a period of one year from the date of invoice. The contract is automatically extended by a further year unless canceled three months before expiration.

The prerequisite for agreeing to an SUS is the presence of the current version of the relevant software.

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Overview

1. General Provisions

1.1 Scope

The purchase of hardware, software, cloud services and other services (collectively "Offerings") through this catalog from Siemens Aktiengesellschaft ("Siemens") is subject to the following General Terms and Conditions for the sale of Siemens Offerings ("Catalog T&C"). These Catalog T&C apply only for orders placed with Siemens in Germany. Customer means the entity that places an order via Siemens.

1.2 Order Process

If Customer writes something in the "free choice text" (F), it is solely for Customer's internal order processing and is not reviewed or taken into consideration by Siemens and will not be legally binding.

1.3 Formation of contract

Any information provided in this catalog or in SiePortal does not constitute a binding offer and may contain errors. In particular, illustrations contained in the Offering descriptions, or in Siemens' catalogs are not binding. Any data, statement to dimensions and weights in our Offering descriptions and catalogs are subject to change without prior notice and become only binding upon contract conclusion.

An individual contract between Siemens and Customer is established when Siemens expressly accepts an order from Customer electronically or in another form, or if such acceptance does not occur, when Siemens fulfills Customer's order through delivery or performance. When the order is placed in SiePortal Siemens will send Customer an electronic confirmation of the receipt of the order, which, however, does not constitute an acceptance of the order. Neither is the Customer obligated to place an order, nor is Siemens obligated to accept any orders placed by Customer.

1.4 Additional Terms

Subordinately to these Catalog T&C, the specific terms and conditions in the text of the product description (if available) apply. If the text of the product description says that the specific terms and conditions mentioned there apply exclusively, only those specific terms and conditions apply. If the text of the product description does not contain any specific terms and conditions or if the specific terms and conditions mentioned there do not apply exclusively, the following terms and conditions apply subordinately in the version valid at the time of contract conclusion:

1.4.1 Hardware

- a. "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry ("Grüne Lieferbedingungen"-GL) "[1] and
- b. the Siemens "Terms on Export Control and Electronically Order Processing "[1]

If the hardware contains open-source software those terms prevail over the GL, we will provide a notification with the hardware specifying the applicable terms. The same applies with respect to any third-party software components in the hardware.

1.4.2 Other Offerings than hardware

- a. for software on premise including any associated maintenance and support services:
  the "General Software and Cloud Supplemental Terms (AGB Germany) "[2] and the
  "Specific Supplemental Terms for on-premises Software of Infrastructure & Industry Business[2];
- b. for cloud services:
  the "General Software and Cloud Supplemental Terms (AGB Germany) "[2] and the cloud services product specific terms stated in the product description;
- c. for services:
  the "Services Supplemental Terms (AGB Germany) "[2]; and

Overview (continued)

- d. generally for all Offerings under a. - c.:
  "Base Terms Germany (AGB Germany) "[2].

1.5 Customers with master or frame agreement

To the extent Offerings purchased are covered by an existing master or frame agreement, the terms and conditions of that agreement shall apply instead of these Catalog T&C.

1.6 Payment agreement and data sharing

If Customer can select and selects that a payment agreement shall apply to the order, upon conclusion of the order the payment agreement will apply and prevail over these Catalog T&C.

For the assessment of financing options, Siemens shares information and data in relation to Customer's company obtained within the scope of its business relationship with its affiliates (as defined in the Base Terms Germany (AGB Germany)).

2. Prices, payment terms and price escalation

2.1 Prices

The prices are in € (Euro), EXW INCOTERMS®2020, exclusive packaging.

2.2 Taxes

All prices and expenses stated in the order are exclusive of any taxes, duties, tariffs and any other charges ("Tax"). Customer will pay or refund Siemens for any applicable Tax imposed by any government authority for Customer's use or receipt of the Offerings.

If Customer is exempt from value-added or sales tax, or similar taxes, it must provide a valid, timely, and executed exemption certificate, direct pay permit, or other such government-approved documentation.

If Customer is required by law to deduct or withhold Tax, Customer will increase the amount it pays to Siemens so that Siemens still receives the amount originally invoiced. Customer will promptly provide all tax receipts confirming it has paid Tax or has withheld Tax.

2.3 Price escalation

2.3.1 Price escalation for metal surcharges

To account for fluctuations commodity prices (silver, copper, aluminum, lead, gold, dysprosium and/or neodymium), surcharges will apply to Offerings containing these metals. Surcharges are calculated daily using the Offering's Metal Factor, which defines the applicable commodity and pricing methods. . Details are provided in the exhibit "Metal surcharges "[3]. The surcharges calculated by using these pricing methods will be added to the Offering's price.

If applicable, the Metal Factor is shown with the Offering's price information or listed on SiePortal (https://sieportal.siemens.com).

2.3.2 General price escalation

If, between ordering and delivery, there are any new or modified taxes, duties, tariffs, or equivalent measures that are directly or indirectly applicable to Siemens' offering, including any hardware, software, or service components contained therein, or a price increase of more than 20% for relevant commodities (e.g. electronic components, semiconductors) applies, Siemens reserves the right to adjust the price accordingly.

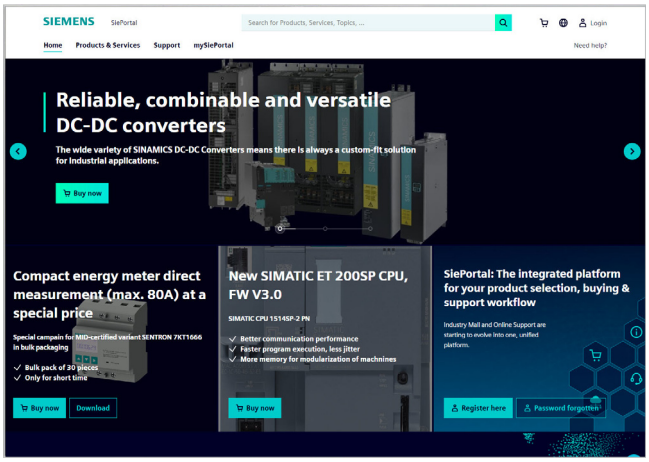
2.4 Price Changes

Prices stated in the SiePortal or in Siemens' catalogs are subject to change without prior notice.

3. Units of measurement and weight

The dimensions and weight of all Offerings are given in meters and kilograms. If the dimensions or weight of the Offerings are specified in other units of measurement, such as inches or pounds, this indicates that these Offerings are intended for export.

[1] Download under www.siemens.com/sts-base-terms-deu
[2] Download under www.siemens.com/sts-st-deu
[3] Download under this link



Easy product selection and ordering with SiePortal

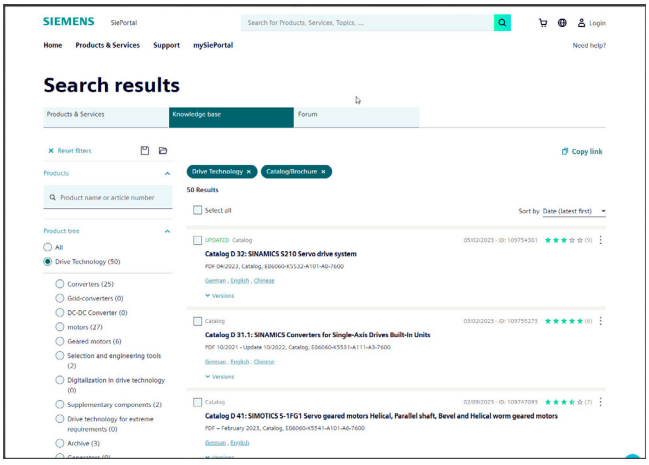
SiePortal > Products & Services

The internet ordering platform of Siemens AG is located in SiePortal. It provides you with online access to a comprehensive product spectrum that is presented in an informative, well-organized way.

Powerful search functions help you select the required products, while configurators enable you to configure complex product and system components quickly and easily. CAx data are also available for you to use.

Data transfer allows the entire procedure, from selection through ordering to tracking and tracing, to be carried out online. Availability checks, individual customer discounting, and quotation preparation are also possible.

https://sieportal.siemens.com



Downloading catalogs

SiePortal > Support > Knowledge base

You can download catalogs and brochures in PDF format from Siemens Industry Online Support without having to register.

The filter box makes it possible to perform targeted searches.

https://sieportal.siemens.com

Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place

For additional information on industrial cybersecurity measures that may be implemented, please visit
www.siemens.com/cybersecurity-industry

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
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