

I/O systems



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	Siemens ST 70 N · 2018

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SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

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 software)
- Device replacement without PG, 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
- 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 IM155-6DP 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 inclusive of server module and PROFIBUS connector with programming device socket

SIMATIC IM155-6PN Basic with PROFINET access

- 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 inclusive of server module

SIMATIC IM 155-6PN Standard with a PROFINET interface for SIMATIC BusAdapters

- 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. 256 bytes in each case for input and output data per module and max. 512 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)
- 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

SIMATIC IM 155-6PN High Feature with a PROFINET interface 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

Overview (continued)SIMATIC IM 155-6PN 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 250 µs, also in isochronous mode
- 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 inclusive of server module

Technical specifications

Article number	6ES7155-6AR00-0AN0 ET 200SP, IM155-6PN BASIC	6ES7155-6AA01-0BN0 ET 200SP, IM155-6PN ST INCL. BA 2XRJ45	6ES7155-6AU00-0BN0 ET 200SP, IM155-6PN ST	6ES7155-6AU00-0CN0 ET 200SP, IM155-6PN HF	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS	6ES7155-6BA00-0CN0 ET 200SP, IM155-6DP HF INCL. DP-CONNECT.
General information						
Product type designation	IM 155-6 PN BA	IM 155-6 PN ST	IM 155-6 PN ST	IM 155-6 PN HF	IM 155-6 PN HS	IM 155-6 DP 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	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Single hot swapping	Yes; Single hot swapping	Yes; Single hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping
Engineering with						
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1	V14	V13 SP1	V13 SP1 Update 6	STEP 7 V14 or higher	V13 SP1
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP4 and higher
• PROFIBUS as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	- / V2.3	- / V2.3	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	- / V2.3	- / V2.3	
Supply voltage						
Type of supply voltage						DC
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes	Yes
Short-circuit protection		Yes				
Mains buffering						
• Mains/voltage failure stored energy time	5 ms	10 ms	5 ms	5 ms	5 ms	5 ms
Power loss						
Power loss, typ.	1.8 W	1.9 W	1.9 W	2.4 W	1.7 W	1.5 W
Hardware configuration						
Rack						
• Modules per rack, max.	12	32; + 16 ET 200AL modules	32; + 16 ET 200AL modules	64; + 16 ET 200AL modules	30	32; + 16 ET 200AL modules
Submodules						
• Number of submodules per station, max.		256	256	256	125	
Interfaces						
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)	
Number of PROFIBUS interfaces						1

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SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications (continued)

Article number	6ES7155-6AR00-0AN0 ET 200SP, IM155-6PN BASIC	6ES7155-6AA01-0BN0 ET 200SP, IM155-6PN ST INCL. BA 2XRJ45	6ES7155-6AU00-0BN0 ET 200SP, IM155-6PN ST	6ES7155-6AU00-0CN0 ET 200SP, IM155-6PN HF	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS	6ES7155-6BA00-0CN0 ET 200SP, IM155-6DP HF INCL. DP-CONNECT.
1. Interface						
Interface types						
- Number of ports - integrated switch - RJ45 (Ethernet)	2 Yes Yes; 2 integrated RJ45 ports	2 Yes Yes; Pre-assembled BusAdapter BA 2x RJ45	2 Yes	2 Yes	2 Yes	
- RS 485 - BusAdapter (PROFINET)	No	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC	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)	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	Yes
Output current of the interface, max.						90 mA
Functionality						
- PROFINET IO Device - PROFIBUS DP slave - Open IE communication - Media redundancy	Yes Yes Yes; PROFINET MRP	Yes Yes Yes; PROFINET MRP	Yes Yes Yes; PROFINET MRP	Yes Yes Yes; PROFINET MRP	Yes Yes Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring	Yes
Interface types						
RJ45 (Ethernet)						
- Transmission procedure 10 Mbps 100 Mbps - Autonegotiation - Autocrossing	PROFINET with 100 Mbit/s full duplex (100BASE-TX) No Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX) Yes Yes	PROFINET with 100 Mbit/s full duplex (100BASE-TX) Yes; for Ethernet services Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX) Yes Yes	PROFINET with 100 Mbit/s full duplex (100BASE-TX) No Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX) Yes Yes	PROFINET with 100 Mbit/s full duplex (100BASE-TX) No Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX) Yes Yes	PROFINET with 100 Mbit/s full duplex (100BASE-TX) No Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX) Yes Yes	
RS 485						
Transmission rate, max.						12 Mbit/s
PROFINET IO Device						
Services						
- Isochronous mode - Open IE communication - IRT	No Yes No	No Yes Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs	No Yes Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs	Yes; Bus cycle time: min. 250 µs Yes 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	Yes; Bus cycle time: min. 125 µs Yes Yes; 125 µs, 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	

Technical specifications (continued)

Article number	6ES7155-6AR00-0AN0 ET 200SP, IM155-6PN BASIC	6ES7155-6AA01-0BN0 ET 200SP, IM155-6PN ST INCL. BA 2XRJ45	6ES7155-6AU00-0BN0 ET 200SP, IM155-6PN ST	6ES7155-6AU00-0CN0 ET 200SP, IM155-6PN HF	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS	6ES7155-6BA00-0CN0 ET 200SP, IM155-6DP HF INCL. DP-CONNECT.
Services (continued)						
- PROFIenergy	No	Yes	Yes	Yes	Yes	
- Prioritized startup	No	Yes	Yes	Yes	Yes	
- Shared device	No	Yes	Yes	Yes	Yes	
- Number of IO Controllers with shared device, max.		2	2	4	4	
Redundancy mode						
- MRP	Yes	Yes	Yes	Yes	Yes	
- MRPD	No	No	No	No	Yes	
- PROFINET system redundancy (S2)	No	No	No	Yes; NAP S2	No	
Open IE communication						
• TCP/IP	Yes	Yes	Yes	Yes	Yes	
• SNMP	Yes	Yes	Yes	Yes	Yes	
• LLDP	Yes	Yes	Yes	Yes	Yes	
PROFIBUS DP						
Services						
- SYNC capability						Yes
- FREEZE capability						Yes
- DPV0						Yes
- DPV1						Yes
Isochronous mode						
Isochronous operation (application synchronized up to terminal)	No	No	No	Yes	Yes	No
Equidistance	No		No	Yes	Yes	
shortest clock pulse				250 µs	125 µs	
max. cycle				4 ms	4 ms	
Bus cycle time (TDP), min.				250 µs	125 µs	
Interrupts/diagnostics/status information						
Status indicator	Yes	Yes	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostic functions	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	Yes; yellow 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	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green LED		Yes; 2x green link LEDs on BusAdapter			
• Connection display DP						Yes; Green DP LED
• Connection to network LINK (green)		Yes; 2x green link LEDs on BusAdapter		Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	
Isolation						
Isolation tested with		707 V DC (type test)	707 V DC between supply voltage and electronics; 1 500 V AC between Ethernet and electronics	707 V DC between supply voltage and electronics (type test); 1 500 V AC between Ethernet and electronics (type test)	707 V DC between supply voltage and electronics (type test); 1 500 V AC between Ethernet and electronics (type test)	707 V DC (type test)
Standards, approvals, certificates						
Network loading class	2	2	2	3	3	
Security level		According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications (continued)

Article number	6ES7155-6AR00-0AN0 ET 200SP, IM155-6PN BASIC	6ES7155-6AA01-0BN0 ET 200SP, IM155-6PN ST INCL. BA 2XRJ45	6ES7155-6AU00-0BN0 ET 200SP, IM155-6PN ST	6ES7155-6AU00-0CN0 ET 200SP, IM155-6PN HF	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS	6ES7155-6BA00-0CN0 ET 200SP, IM155-6DP HF INCL. DP-CONNECT.
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Dimensions						
Width	35 mm	50 mm	50 mm	50 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm	74 mm	74 mm	74 mm
Weights						
Weight, approx.	125 g	190 g; IM 155-6 PN BA with 2x RJ45 ports and server module	147 g; without BusAdapter	147 g; without BusAdapter	147 g; without BusAdapter	150 g

Ordering data

Article No.

Article No.

IM155-6PN Basic PROFINET interface module With server module; two integrated RJ45 sockets	6ES7155-6AR00-0AN0	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
IM155-6PN Basic PROFINET interface module With server module • With attached SIMATIC BA 2xRJ45 BusAdapter • Without SIMATIC BusAdapter	6ES7155-6AA01-0BN0 6ES7155-6AU00-0BN0	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
IM155-6PN High Feature PROFINET interface module With server module, without SIMATIC BusAdapter	6ES7155-6AU00-0CN0	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
IM155-6PN High Speed PROFINET interface module With server module, without SIMATIC BusAdapter	6ES7155-6AU00-0DN0	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
IM155-6DP High Feature PROFIBUS interface module With server module, with PROFIBUS plug with PG socket	6ES7155-6BA00-0CN0	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
Accessories		Station expansion with IP67 I/O system ET 200AL	
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules from Standard function class or above; max. cable length 50 m	6ES7193-6AR00-0AA0	ET 200SP BA-Send 1 x FC BusAdapter	6ES7193-6AS00-0AA0
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules from Standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	6ES7193-6AF00-0AA0	BaseUnit BU-Send	6ES7193-6BN00-0NE0
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		

Ordering data	Article No.		Article No.
Additional accessories		SIMATIC Manual Collection	6ES7998-8XC01-8YE0
Labeling strips		Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
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	SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
Reference identification label	6ES7193-6LF30-0AW0	Current "Manual Collection" DVD and the three subsequent updates	
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter		Spare parts	
DIN rail 35 mm		Server module	6ES7193-6PA00-0AA0
Length: 483 mm for 19" cabinets	6ES5710-8MA11	Terminates an ET 200SP station; included in the scope of delivery of the interface modules	
Length: 530 mm for 600 mm cabinets	6ES5710-8MA21	Power supply connector for ET 200SP head-end stations (interface module, CPU and open controller)	
Length: 830 mm for 900 mm cabinets	6ES5710-8MA31	For connecting the 24 V DC supply voltage, push-in version; included in scope of delivery of the head-end station	
Length: 2 m	6ES5710-8MA41	with push-in terminals (10 units)	6ES7193-4JB00-0AA0
Manuals for ET 200SP distributed I/O system		with screw-type terminals (10 units)	6ES7193-4JB50-0AA0
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 Manual Collection can be downloaded from the Internet as a PDF file:			
https://support.industry.siemens.com/cs/de/en/view/84133942			

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > SIPLUS interface modules

Overview



- Interface module for linking the I/O modules to a higher-level controller with PROFINET or PROFIBUS
- Server module included in the scope of supply
- Station expansion with IP67 I/O system ET 200AL via ET-connection to BU-Send / BA-Send
- PROFINET bus connection
 - 2 ports for line configuration
 - PN connection selected via BusAdapter (ST, HF)
 - Two integrated RJ45 sockets (BA)
- PROFIBUS bus connection
 - 9-pin sub D socket
 - PROFIBUS connector included in scope of delivery
 - Hot swapping (module replacement during operation)
 - Startup and operation with gaps
 - Dynamic re-parameterization in RUN mode
 - Configuration control (option handling)
 - Pluggable 24 V DC supply connector
 - Electronically readable rating plate (I&M data)

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.

Technical specifications

Article number based on	6AG1155-6AA01-7BN0 6ES7155-6AA01-0BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6AG1155-6AU00-2CN0 6ES7155-6AU00-0CN0 SIPLUS ET 200SP IM155-6PN HF	6AG1155-6AU01-7BN0 6ES7155-6AU01-0BN0 SIPLUS ET 200SP IM155-6PN ST	6AG1155-6BA00-7CN0 6ES7155-6BA00-0CN0 SIPLUS ET 200SP IM155-6DP HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	0 °C	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C	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 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)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants		Yes		Yes

Technical specifications (continued)

Article number based on	6AG1155-6AA01-7BN0 6ES7155-6AA01-0BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6AG1155-6AU00-2CN0 6ES7155-6AU00-0CN0 SIPLUS ET 200SP IM155-6PN HF	6AG1155-6AU01-7BN0 6ES7155-6AU01-0BN0 SIPLUS ET 200SP IM155-6PN ST	6AG1155-6BA00-7CN0 6ES7155-6BA00-0CN0 SIPLUS ET 200SP IM155-6DP HF
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 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C4 (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 6S4 incl. sand, dust; *	Yes; Class 6S4 incl. sand, dust; *	Yes; Class 6S4 incl. sand, dust; *	Yes; Class 6S4 incl. sand, dust; *
Note				
- Note regarding classification of environmental conditions acc. to EN 60721	* 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!

Ordering data

Article No.

SIPLUS PROFINET IM155-6PN
Standard interface module

(extended temperature range and exposure to environmental substances)

- IM 155-6PN ST, with server module and installed BA 2xRJ45 BusAdapter, plus extended power failure backup time

6AG1155-6AA01-7BN0**SIPLUS interface module**
High Feature

(extended temperature range and exposure to environmental substances)

- IM 155-6DP HF, with server module, with multi-hot-swap, incl. PROFIBUS connector
- IM 155-6PN HF, incl. server module, without BusAdapter
- IM 155-6PN HF, including server module, without BusAdapter, plus extended power failure backup time

6AG1155-6BA00-7CN0**6AG1155-6AU00-2CN0****6AG1155-6AU01-7BN0****Accessories**

See SIMATIC ET 200SP, IM 155-6 interface module

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input modules

Overview



- 4, 8 and 16-channel digital input (DI) modules
- Apart from the standard type of delivery in an individual 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 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 distribution 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 rated voltages of up to 24 V DC or 230 V AC
- PNP (sink input) and NPN (source 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 rating plate (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 equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
 - Parameterizable input delay time
 - Isochronous mode (simultaneous equidistant reading of all input channels)
 - Hardware interrupts
 - Pulse extension
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis 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
 - Shielding terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

Overview of digital input modules

Digital input	PU	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 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 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

Overview (continued)Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC00 to CC05	--
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC00 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC00 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC00 to CC05	--
BU type B1 • Forwarding of load group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--

Overview of potential distribution modules

Potential distribution module	PU	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for beginning a new load group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for beginning a new load group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP2	CC00, CC63

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input modules

Overview (continued)

Potential distribution module	PU	Article No.	CC codes for process terminals
PotDis TB Type BR-W, 18x internally jumpered terminals, without connection 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

Technical specifications

Article number	6ES7131-6BF01-0AA0 ET 200SP, DI 8x 24V DC Basic, PU 1	6ES7131-6BF61-0AA0 ET 200SP, DI 8x 24V DC SRC BA	6ES7131-6BF01-0BA0 ET 200SP, DI 8x 24V DC ST, PU 1	6ES7131-6BH01-0BA0 ET 200SP, DI 16x 24V DC ST, PU 1
General information				
Product type designation	DI 8x24 VDC BA	DI 8x24 VDC SRC BA	DI 8x24 VDC ST	DI 16x24 VDC ST
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&M3
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V14	V14	V14	V14
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 or higher	V5.5 SP3
• PCS 7 configurable/integrated as of version			V8.1 SP1	V8.1 SP1
• PROFIBUS as of 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
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• DI	Yes	Yes	Yes	Yes
• Counter	No	No	No	No
• Oversampling	No	No	No	No
• MSI	No	No	No	No
Supply voltage				
Type of supply voltage	DC	24 V DC	DC	DC
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Encoder supply				
Number of outputs	8		8	
Output voltage encoder supply, min.	19.2 V		19.2 V	
Short-circuit protection	Yes; per module	No	Yes; per module	
24 V encoder supply				
• 24 V	Yes		Yes	No
• Short-circuit protection	Yes		Yes	
• Output current, max.			700 mA; Total current of all encoders	

Technical specifications (continued)

Article number	6ES7131-6BF01-0AA0 ET 200SP, DI 8x 24V DC Basic, PU 1	6ES7131-6BF61-0AA0 ET 200SP, DI 8x 24V DC SRC BA	6ES7131-6BF01-0BA0 ET 200SP, DI 8x 24V DC ST, PU 1	6ES7131-6BH01-0BA0 ET 200SP, DI 16x 24V DC ST, PU 1
Digital inputs				
Number of digital inputs	8	8	8	16
Digital inputs, parameterizable	Yes	Yes	Yes	Yes
Source/sink input	P-reading	m-reading	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2				
Input characteristic curve in accordance with IEC 61131, type 3				
Input voltage				
• Type of input voltage	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5V	30 V to -5 V (reference potential is L+)	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V
Input current				
• for signal "1", typ.	6.8 mA	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)	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)
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	200 m	600 m	600 m
Encoder				
Connectable encoders				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1.5 mA	1.5 mA	1.5 mA
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	No	No
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
- parameterizable	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
• 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
• Short-circuit	No	No	Yes; Module-wise	No
• Group error				Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input modules

Technical specifications (continued)

Article number	6ES7131-6BF01-0AA0 ET 200SP, DI 8x 24V DC Basic, PU 1	6ES7131-6BF61-0AA0 ET 200SP, DI 8x 24V DC SRC BA	6ES7131-6BF01-0BA0 ET 200SP, DI 8x 24V DC ST, PU 1	6ES7131-6BH01-0BA0 ET 200SP, DI 16x 24V DC ST, PU 1
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	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 channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Isolation				
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Standards, approvals, certificates				
Suitable for safety functions		No		No
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				
• Ambient air temperature-barometric pressure-altitude	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	28 g	28 g	28 g	28 g

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF	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
General information				
Product type designation	DI 8x24 V DC HF	DI 8x24 V DC HS	DI 8xNAMUR HF	DI 4x120 ... 230 V AC ST
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&M3
Engineering with				
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1 / -	V13 SP1	V13 / V13	V14
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3
• PCS 7 configurable/integrated as of version	V8.1 SP1			
• PROFIBUS as of GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• DI	Yes	Yes	Yes	Yes
• Counter	No	Yes	No	No
• Oversampling	No	Yes	No	No
• MSI	Yes	No	No	No

Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8X24VDC HF	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
Supply voltage				
Type of supply voltage	DC	DC	24 V DC	100 - 240 V AC
Rated value (DC)	24 V	24 V	24 V	
Rated value (AC)				230 V
Reverse polarity protection	Yes	Yes	Yes	No
Encoder supply				
Number of outputs	8		8	4
Output voltage encoder supply, min.	19.2 V			
Short-circuit protection	Yes		Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided
Output current				
• up to 60 °C, max.				10 A
24 V encoder supply				
• 24 V	Yes	Yes	No	
• Short-circuit protection	Yes; per channel, electronic	Yes; per module, electronic	No	
• Output current, max.		700 mA		
Digital inputs				
Number of digital inputs	8	8	8; NAMUR	4
Digital inputs, parameterizable	Yes		Yes	
Source/sink input	P-reading	P-reading		
Input characteristic curve in accordance with IEC 61131, type 3	Yes			Yes
Pulse extension	Yes; Pulse duration from 4 µs	Yes	Yes; 0.5 s, 1 s, 2 s	
• 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		
• Freely usable digital input		Yes		
• Counter		Yes		
- Number, max.		4		
- Counting frequency, max.		10 kHz		
- Counting width		32 bit		
- Counting direction up/down		Yes		
• Digital input with oversampling		Yes		
- Number, max.		8		
- Values per cycle, max.		32		
- Resolution, min.		7.8125 µs		
Input voltage				
• Type of input voltage	DC	DC	DC	120/230 V AC (47 Hz to 63 Hz)
• Rated value (DC)	24 V	24 V	8.2 V	
• Rated value (AC)				230 V
• for signal "0"	-30 to +5V	-30 to +5V		0V AC to 40V AC
• for signal "1"	+11 to +30V	+11 to +30V		74 V AC to 264 V AC

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input modules

Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8X24VDC HF	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
Input current - for signal "1", typ. for 10 k switched contact - for signal "0" - for signal "1" for unswitched contact - for signal "0", max. (permissible quiescent current) - for signal "1" for NAMUR encoders - for signal "0" - for signal "1"	2.5 mA	6 mA	0.35 to 1.2 mA 2.1 to 7 mA 0.5 mA typ. 8 mA 0.35 to 1.2 mA 2.1 to 7 mA	10.8 mA
Input delay (for rated value of input voltage) - tolerated changeover time for changeover contacts for standard inputs - parameterizable for interrupt inputs - parameterizable for counter/technological functions - parameterizable for NAMUR inputs - at "0" to "1", max. - at "1" to "0", max.	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 Yes Yes	300 ms No 12 ms 12 ms	No
Cable length - shielded, max. - unshielded, max.	1 000 m 600 m	50 m 50 m	200 m	1 000 m 600 m
Encoder Connectable encoders - NAMUR encoder / changeover contact according to EN 60947 - Single contact / changeover contact unconnected - Single contact / changeover contact connected with 10 kΩ 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes 1.5 mA	Yes 1.5 mA	Yes Yes Yes	Yes
Isochronous mode - Isochronous operation (application synchronized up to terminal) - Filtering and processing time (TCI), min. - Bus cycle time (TDP), min.	Yes 420 µs 500 µs	Yes 125 µs	No	No
Interrupts/diagnostics/ status information Diagnostics function	Yes	Yes	Yes	
Alarms - Diagnostic alarm - Hardware interrupt	Yes; channel by channel Yes; Parameterizable, channels 0 to 7	Yes Yes	Yes; channel by channel Yes; Parameterizable, channels 0 to 7	No No

Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8X24VDC HF	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
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	
• Monitoring the supply voltage	Yes	Yes	Yes	No
- parameterizable	Yes	Yes	Yes	
• Monitoring of encoder power supply	Yes; channel by channel	Yes; Module-wise	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: 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
• 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
Isolation				
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	2 545 V DC/2 s (routine test)
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
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				
• Ambient air temperature-barometric pressure-altitude	On request: Negative ambient temperature down to -30 °C (without condensation), installation altitudes between 2 000 m and 5 000 m			On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m
Dimensions				
Width	15 mm	15 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	28 g	32 g	36 g

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > Digital input modules

Ordering data

Article No.

Article No.

Digital input modules

Delivery options:
Apart from the standard type of delivery in an individual 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 of unpacking individual modules.

The number of modules required is the number of modules ordered.
The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.

Digital input module
DI 8x24 V DC, Basic, BU type A0, color code CC01

- PU: 1 unit
- PU: 10 units

6ES7131-6BF01-0AA0
6ES7131-6BF01-2AA0
6ES7131-6BF61-0AA0

Digital input module
DI 8x24 V DC Source Input, Basic, BU type A0, color code CC02; PU: 1 unit

Digital input module
DI 8x24 V DC Standard, BU type A0, color code CC01

- PU: 1 unit
- PU: 10 units

6ES7131-6BF01-0BA0
6ES7131-6BF01-2BA0

Digital input module
DI 16 x 24 V DC Standard, BU type A0, color code CC00

- PU: 1 unit
- PU: 10 units

6ES7131-6BH01-0BA0
6ES7131-6BH01-2BA0
6ES7131-6BF00-0CA0

Digital input module
DI 8x24 V DC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI); PU: 1 unit

6ES7131-6BF00-0DA0

Digital input module
DI 8x24 V DC High Speed, BU type A0, color code CC01; 3 operating modes (fast isochronous DI, 4 pulse counters 32-bit 10 kHz, oversampling); PU: 1 unit

6ES7131-6TF00-0CA0

Digital input module
DI 8xNAMUR High Feature, BU type A0, color code CC01; PU: 1 unit

6ES7131-6FD01-0BB1

Digital input module
DI 4x120 V AC ... 230 V AC Standard, BU type B1, color code CC41; PU: 1 unit

Usable 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)

- 1 unit
- 10 units

6ES7193-6BP20-0DA0
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)

- 1 unit
- 10 units

6ES7193-6BP00-0DA0
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

- 1 unit
- 10 units

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

BU20-P12+A0+4B

BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; 1 unit

6ES7193-6BP20-0BB1

Potential distribution modules

PotDis BU

PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for beginning a new load group (max. 10 A)

6ES7193-6UP00-0DP1

PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group

6ES7193-6UP00-0BP1

PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for beginning a new load group (max. 10 A)

6ES7193-6UP00-0DP2

PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group

6ES7193-6UP00-0BP2

PotDis TB

PotDis TB, type BR-W, 18x internally jumpered terminals, without connection 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

Ordering data	Article No.		Article No.
Accessories		Color-coded labels for 20 mm-wide BaseUnits	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0	Color code CC41, for 16 push-in terminals; BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	6ES7193-6CP41-2MB0
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Color-coded labels for PotDis BU	
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	6ES7193-6CP62-2MA0
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0	Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	6ES7193-6CP63-2MA0
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0	Color-coded labels for PotDis TB	
BU cover For covering empty slots (gaps); 5 units		Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units	6ES7193-6CP10-2MT0
• 15 mm wide	6ES7133-6CV15-1AM0	Color code CC11, for 18 process terminals, PotDis TB, yellow/green (terminals 1 to 18); 10 units	6ES7193-6CP11-2MT0
• 20 mm wide	6ES7133-6CV20-1AM0	Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	6ES7193-6CP12-2MT0
Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0	Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	6ES7193-6CP13-2MT0
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 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		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Overview



- 4, 8 and 16-channel digital output (DQ) modules
- Apart from the standard type of delivery in an individual 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 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 distribution 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 of connecting actuators with rated load 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 controller)
- PNP (source output) and NPN (sink output) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSO operating mode (simultaneous reading of input data from as many as three other controllers)
 - Pulse width modulation mode (output value as pulse-pause ratio of between 0.0% and 100.0% for controlling the output current)
 - Oversampling (n-fold equidistant 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 equidistant output of all output channels)
 - Output of substitute value in the event of interruptions to communication (0, 1 or last value retained)
 - 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)
 - Diagnosis 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 PROFINET profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding terminal

A quick and clear comparison of the functions of the different DQ modules is offered by the TIA Selection Tool.

Overview (continued)Overview of digital output modules

Digital output	PU	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 8 x 24 V DC/0.5 A SNK BA	1	6ES7132-6BF61-0AA0	CC01	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 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 HF	1	6ES7132-6BD20-0CA0	CC02	A0
DQ 4 x 24 V DC/2 A HS	1	6ES7132-6BD20-0DA0	CC02	A0
With three operating modes: • Fast isochronous DQ with valve control • Pulse width modulation • Oversampling				
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	1	6ES7132-6FD00-0CU0	CC20	U0
With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control				
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

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Overview (continued)

BaseUnit	PU	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type B0 • Forwarding of load group (dark) • 12 process terminals • With 4 AUX terminals	1	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B0 • Forwarding of load group (dark) • 12 process terminals • With 4 AUX terminals	10	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B1 • Forwarding of load group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct in-feed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type U0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC20	--
BU type U0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC20	--
BU type U0 • New load group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC20	--
BU type U0 • New load group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC20	--

Overview of potential distribution modules

Potential distribution module	PU	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for beginning a new load group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for beginning a new load group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP2	CC00, CC63

Overview (continued)

Potential distribution module	PU	Article No.	CC codes for process terminals
PotDis TB Type BR-W, 18x internally jumpered terminals, without connection 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

Technical specifications

Article number	6ES7132-6BH00-0AA0	6ES7132-6BH01-0BA0	6ES7132-6BF61-0AA0	6ES7132-6BF01-0AA0	6ES7132-6BF01-0BA0
	ET 200SP, DQ 16x24VDC/ 0.5A BA, PU 1	ET 200SP, DQ 16x 24V DC/ 0.5A ST, PU 1	ET 200SP, DQ 8x 24VDC/ 0.5A SINK BA, PU 1	ET 200SP, DQ 8x 24V DC/ 0.5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/ 0.5A ST, PU 1
General information					
Product type designation	DQ 16x 24 V DC/ 0.5 A BA, PU 1	DQ 16x24VDC/ 0.5A ST	DQ 8x 24 V DC/ 0.5 A SNK BA, PU 1	DQ 8x24 VDC/ 0.5 A BA	DQ 8x24VDC/ 0.5A ST, PU 1
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&M3	Yes; I&M0 to I&M3
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V14	V14	V14	V14	V14
• STEP 7 configurable/integrated as of version	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3	V5.5 SP3 or higher
• PCS 7 configurable/integrated as of version		V8.1 SP1			V8.1 SP1
• PROFIBUS as of 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 as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No	No
• PWM	No	No	No	No	No
• Oversampling	No	No	No	No	No
• MSO	No	No	No	No	No
Supply voltage					
Type of supply voltage	DC	DC	DC	DC	DC
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes		Yes	Yes
Digital outputs					
Type of digital output	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Sink output (NPN, M switching)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)
Number of digital outputs	16	16	8	8	8
Current-sinking	No	No	Yes		
Current-sourcing	Yes	Yes		Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes; per channel, electronic	Yes
Open-circuit detection	No	Yes			
Limitation of inductive shutdown voltage to	Typ. L+ (-53 V)	Typ. L+ (-50 V)	Typ. 47 V	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes	Yes	Yes	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

Article number	6ES7132-6BH00-0AA0 ET 200SP, DQ 16x24VDC/ 0.5A BA, PU 1	6ES7132-6BH01-0BA0 ET 200SP, DQ 16x 24V DC/ 0.5A ST, PU 1	6ES7132-6BF61-0AA0 ET 200SP, DQ 8x 24VDC/ 0.5A SINK BA, PU 1	6ES7132-6BF01-0AA0 ET 200SP, DQ 8x 24V DC/ 0.5A Basic, PU 1	6ES7132-6BF01-0BA0 ET 200SP, DQ 8x 24V DC/ 0.5A ST, PU 1
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• on lamp load, max.	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
• upper limit	100 kΩ	12 kΩ	3 400 Ω	100 kΩ	12 kΩ
Output voltage					
• Type of output voltage			DC	DC	DC
• for signal "1", min.					L+ (-0.8 V)
Output current					
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	30 µA	0.1 mA	5 µA	10 µA	0.1 mA
Output delay with resistive load					
• "0" to "1", typ.	80 µs; at rated load	50 µs			
• "0" to "1", max.	150 µs; at rated load		300 µs	100 µs; at rated load	50 µs; at rated load
• "1" to "0", typ.	100 µs; at rated load	100 µs			
• "1" to "0", max.	200 µs; at rated load		600 µs	150 µs; at rated load	100 µs; at rated load
Parallel switching of two outputs					
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	0.5 Hz	2 Hz	2 Hz
• on lamp load, max.	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
• Current per module, max.	8 A	8 A	4 A	4 A	4 A
Total current of the outputs (per module)					
horizontal installation					
- up to 30 °C, max.		8 A		4 A	4 A
- up to 40 °C, max.		8 A		4 A	4 A
- up to 50 °C, max.		6 A		4 A	4 A
- up to 60 °C, max.	8 A	4 A	4 A	4 A	4 A
vertical installation					
- up to 30 °C, max.		8 A; in all other mounting positions		4 A; in all other mounting positions	4 A; in all other mounting positions
- up to 40 °C, max.		6 A; in all other mounting positions		4 A; in all other mounting positions	4 A; in all other mounting positions
- up to 50 °C, max.	8 A	4 A; in all other mounting positions	4 A; in all other mounting positions	4 A; in all other mounting positions	4 A; in all other mounting positions
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m	600 m
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No	No	No
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

Technical specifications (continued)

Article number	6ES7132-6BH00-0AA0 ET 200SP, DQ 16x24VDC/ 0.5A BA, PU 1	6ES7132-6BH01-0BA0 ET 200SP, DQ 16x 24V DC/ 0.5A ST, PU 1	6ES7132-6BF61-0AA0 ET 200SP, DQ 8x 24VDC/ 0.5A SINK BA, PU 1	6ES7132-6BF01-0AA0 ET 200SP, DQ 8x 24V DC/ 0.5A Basic, PU 1	6ES7132-6BF01-0BA0 ET 200SP, DQ 8x 24V DC/ 0.5A ST, PU 1
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break	No	Yes; Module-wise	No	No	Yes; Module-wise
• Short-circuit	No		No	No	
• Short-circuit to M		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	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
Isolation					
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-oriented group deactivation		Yes		Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C; in all other mounting positions	0 °C; in all other mounting positions	0 °C; in all other mounting positions	0 °C; in all other mounting positions
• vertical installation, max.	50 °C	50 °C; in all other mounting positions	50 °C; in all other mounting positions	50 °C; in all other mounting positions	50 °C; in all other mounting positions
Altitude during operation relating to sea level					
• Ambient air temperature-barometric pressure-altitude	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m
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.	30 g	30 g	30 g	30 g	30 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

Article number	6ES7132-6BF00-0CA0 ET 200SP, DQ 8x24VDC/0.5A HF	6ES7132-6BD20-0BA0 ET 200SP, DQ 4x24VDC/2A ST	6ES7132-6BD20-0CA0 ET 200SP, DQ 4x24VDC/2A HF	6ES7132-6BD20-0DA0 ET 200SP, DQ 4x24VDC/2A HIGH SPEED, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4x24...230VAC/2A ST
General information					
Product type designation	DQ 8x24 V DC/0.5 A HF	DQ 4x24 V DC/2 A ST	DQ 4x24 V DC/2 A HF	DQ 4x24 V DC/2 A HS	DQ 4x24 ... 230 V AC/2 A ST
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&M3	Yes; I&M0 to I&M3
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 / -	V11 SP2 / V13	V13 / V13	V13 SP1	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version	V8.1 SP1	V8.1 SP1			
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	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
• Oversampling	No	No	No	Yes	No
• MSO	Yes	No	Yes	No	No
Supply voltage					
Type of supply voltage	DC	DC	DC	DC	24V AC to 230V AC
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
Short-circuit protection	Yes	Yes	Yes	Yes	No; When using BU type B1, a miniature, quick-response fuse with 10 A tripping current must be provided
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)	L+ -(37 to 41V)	M (-1 V)	
Controlling a digital input	Yes	Yes	Yes; Minimum current consumption 7 mA	No	Yes
Digital output functions, parameterizable					
• PWM output				Yes	
- Number, max.				4	
- Cycle duration, parameterizable				Yes; 0 ms, 0.2 ms, 0.4 ms, 0.93 ms, 1.33 ms, 4.27 ms, 10.67 ms, 21.33 ms, 34.13 ms, 59.73 ms	
• Digital output with oversampling				Yes	
- Number, max.				4	
- Values per cycle, max.				32	
- Resolution, min.				100 µs	
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	2 A	2 A	2 A	2 A
• on lamp load, max.	5 W	10 W	10 W	10 W	100 W

Technical specifications (continued)

Article number	6ES7132-6BF00-0CA0 ET 200SP, DQ 8X24VDC/0.5A HF	6ES7132-6BD20-0BA0 ET 200SP, DQ 4X24VDC/2A ST	6ES7132-6BD20-0CA0 ET 200SP, DQ 4X24VDC/2A HF	6ES7132-6BD20-0DA0 ET 200SP, DQ 4X24VDC/2A HIGH SPEED, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4X24..230VAC/2A ST
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					
• Type of output voltage	DC	DC	DC	DC	24V AC to 230V AC
• 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.		50 µs		1 µs	10 ms
• "1" to "0", typ.	100 µs	100 µs	100 µs		
• "1" to "0", max.		100 µs		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
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	5 kHz	10 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz	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	8 A	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; in all other mounting positions	4 A	4 A	4 A; DQ mode	4 A
- up to 60 °C, max.		4 A	4 A	4 A; DQ mode	
Triac outputs					
• Size of motor starters according to NEMA, max.					5
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	50 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	50 m	600 m
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	No	Yes	Yes; Operating modes DQ and OVS only	No
Execution and activation time (TCO), min.	48 µs				
Bus cycle time (TDP), min.	500 µs		500 µs	125 µs	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

Article number	6ES7132-6BF00-0CA0 ET 200SP, DQ 8X24VDC/0.5A HF	6ES7132-6BD20-0BA0 ET 200SP, DQ 4X24VDC/2A ST	6ES7132-6BD20-0CA0 ET 200SP, DQ 4X24VDC/2A HF	6ES7132-6BD20-0DA0 ET 200SP, DQ 4X24VDC/2A HIGH SPEED, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4X24...230VAC/2A 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
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	No
• Wire-break	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	No	No
• Short-circuit	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	Yes; Module-wise	No
• 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
Isolation					
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	2 545 V DC/2 s (routine test)
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
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 ET 200SP, DQ 4X24...230VAC/ 2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/ 2A ST, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC...230VAC/ 5A, PU 1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-MA 4X120VDC...230VAC/5A ST
General information				
Product type designation	DQ 4x24 ... 230 V AC/ 2 A HF, PU 1	RQ CO 4x 24 V DC/ 2 A ST, PU 1	RQ 4x120 VDC ... 230 VAC/ 5 A NO ST	RQ 4x120 V DC ... 230 V AC/ 5 A NO MA ST
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&M3
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V14	V14	V14	V13 SP1
• STEP 7 configurable/integrated as of version	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version			V8.1 SP1	
• PROFIBUS as of 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	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3

Technical specifications (continued)

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, PU 1	ET 200SP, RQ NO 4x 120VDC...230VAC/ 5A, PU 1	ET 200SP, RQ NO-MA 4X120VDC...230VAC/5A ST
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				
Type of supply voltage	24 V AC to 230 V AC, 47 ... 63 Hz	DC	DC	DC
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		Relays	Relays	Relays
Number of digital outputs	4	4	4	4
Current-sinking	No	Yes	Yes	
Current-sourcing	Yes	Yes	Yes	
Digital outputs, parameterizable	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			
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				
• Type of output voltage	24V AC to 230V AC			AC/DC
• 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	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

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, PU 1	ET 200SP, RQ NO 4x 120VDC...230VAC/ 5A, PU 1	ET 200SP, RQ NO-MA 4X120VDC...230VAC/5A ST
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, max.			0.5 Hz	0.5 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			
• 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; 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		
- up to 50 °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	6 A	20 A	20 A
- up to 60 °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	4 A	16 A	16 A
vertical installation				
- up to 30 °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		
- 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	6 A	20 A	20 A
- up to 50 °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	4 A; in all other mounting positions	16 A; in all other mounting positions	16 A

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, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC...230VAC/ 5A, PU 1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-MA 4x120VDC...230VAC/5A ST
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 6A	Yes, with 6A
• Number of operating cycles, max.			7 000 000; see additional description in the manual	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	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
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	200 m	200 m	200 m
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	No	No
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostic messages				
• 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
Isolation				
Isolation tested with	2 545 V DC/2 s (routine test)	707 V DC (type test)	2 500 V DC (type test)	2 500 V DC (type test)
tested with				
• between channels and backplane bus/supply voltage			2500 V DC	2500 V DC
• between backplane bus and supply voltage			707 V DC (type test)	707 V DC (type test)
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications (continued)

Article number	6ES7132-6FD00-0CU0	6ES7132-6GD51-0BA0	6ES7132-6HD01-0BB1	6ES7132-6MD00-0BB1
	ET 200SP, DQ 4x24V..230VAC/ 2A HF, PU 1	ET 200SP, RQ CO 4x 24V DC/ 2A ST, PU 1	ET 200SP, RQ NO 4x 120VDC..230VAC/ 5A, PU 1	ET 200SP, RQ NO-MA 4x120VDC..230VAC/5A ST
Ambient conditions				
Ambient temperature during operation				
- horizontal installation, min. - horizontal installation, max. - vertical installation, min.			0 °C 60 °C 0 °C; in all other mounting positions 50 °C; in all other mounting positions	
Altitude during operation relating to sea level				
Ambient air temperature-barometric pressure-altitude		On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	On request: Ambient temperatures lower than 0 °C (without condensation) and/or 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

Ordering data

Article No.

Article No.

Digital output modules

Type of delivery:
Apart from the standard type of delivery in an individual 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 of unpacking individual modules.

The number of modules required is the number of modules ordered. The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.

Digital output module
DQ 16x24 V DC/0.5 A Basic,
BU type A0, color code CC00

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 16x24 V DC/0.5 A Standard,
BU type A0, color code CC00

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 8x24 V DC/0.5 A Sink Output,
Basic, BU type A0,
color code CC01

- PU: 1 unit

Digital output module
DQ 8x24 V DC/0.5 A Basic,
BU type A0,
color code CC02

- PU: 1 unit
- PU: 10 units

6ES7132-6BH00-0AA0
6ES7132-6BH00-2AA0

6ES7132-6BH01-0BA0
6ES7132-6BH01-2BA0

6ES7132-6BF61-0AA0

6ES7132-6BF01-0AA0
6ES7132-6BF01-2AA0

Digital output module
DQ 8x24 V DC/0.5 A Standard,
BU type A0,
color code CC02

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 8x24 V DC/0.5A High Feature,
BU type A0,
color code CC02

- PU: 1 unit

Digital output module
DQ 4x24 V DC/2 A Standard,
BU type A0,
color code CC02

- PU: 1 unit
- PU: 10 units

Digital output module
DQ 4x24 V DC/2 A High Feature,
BU type A0, color code CC02,
channel-precise diagnostics,
isochronous mode, shared output (MSO)

- PU: 1 unit

Digital output module
DQ 4x24 V DC/2 A High Speed,
BU type A0, color code CC02,
3 operating modes
(fast isochronous DQ with valve control, pulse width modulation, oversampling)

- PU: 1 unit

Digital output module
DQ 4x24 V AC ... 230 V AC/
2 A Standard for BU type B1,
color code CC41

- PU: 1 unit
- PU: 10 units

6ES7132-6BF01-0BA0
6ES7132-6BF01-2BA0

6ES7132-6BF00-0CA0

6ES7132-6BD20-0BA0
6ES7132-6BD20-2BA0

6ES7132-6BD20-0CA0

6ES7132-6BD20-0DA0

6ES7132-6FD00-0BB1
6ES7132-6FD00-2BB1

Ordering data	Article No.	Article No.
Digital output module DQ 4x24 V AC ... 230 V AC/2 A 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) • PU: 1 unit	6ES7132-6FD00-0CU0	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) • PU: 1 unit • PU: 10 units 6ES7193-6BP00-0DU0 6ES7193-6BP00-2DU0
Signal relay module RQ CO 4x24 V UC/2 A Standard, changeover contact, BU type A0, color code CC00 • PU: 1 unit	6ES7132-6GD51-0BA0	BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group • PU: 1 unit • PU: 10 units 6ES7193-6BP00-0BU0 6ES7193-6BP00-2BU0
Relay module RQ NO 4x120 V DC-230 V AC/5 A Standard, NO contact, BU type B0, B1 • PU: 1 unit • PU: 10 units	6ES7132-6HD01-0BB1 6ES7132-6HD01-2BB1 6ES7132-6MD00-0BB1	Potential distribution modules PotDis BU PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for beginning a new load group (max. 10 A) 6ES7193-6UP00-0DP1 PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group 6ES7193-6UP00-0BP1 PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for beginning a new load group (max. 10 A) 6ES7193-6UP00-0DP2 PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group 6ES7193-6UP00-0BP2
Usable 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) • PU: 1 unit • PU: 10 units	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	PotDis TB PotDis TB, type BR-W, 18x internally jumpered terminals, without connection 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
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) • PU: 1 unit • PU: 10 units	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	Accessories Equipment labeling plate 6ES7193-6LF30-0AW0 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter
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 • PU: 1 unit • PU: 10 units	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	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
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group • PU: 1 unit • PU: 10 units	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0	BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide 6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
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 load group • PU: 1 unit • PU: 10 units	6ES7193-6BP20-0BB0 6ES7193-6BP20-2BB0	
BU20-P12+A0+4B BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; PU: 1 unit	6ES7193-6BP20-0BB1	

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital output modules

Ordering data	Article No.		Article No.
Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0		
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 Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	6ES7193-6CP00-2MA0 6ES7193-6CP01-2MA0 6ES7193-6CP01-4MA0 6ES7193-6CP02-2MA0 6ES7193-6CP02-4MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0 6ES7193-6CP73-4AA0	Color-coded labels for 20 mm-wide BaseUnits Color code CC41, for 16 push-in terminals; BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A); 10 units Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units Color-coded labels for PotDis BU Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units Color-coded labels for PotDis TB Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units Color code CC11, for 18 process terminals, PotDis TB, yellow/green (terminals 1 to 18); 10 units Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	6ES7193-6CP41-2MB0 6ES7193-6CP81-2AB0 6ES7193-6CP82-2AB0 6ES7193-6CP83-2AB0 6ES7193-6CP62-2MA0 6ES7193-6CP63-2MA0 6ES7193-6CP10-2MT0 6ES7193-6CP11-2MT0 6ES7193-6CP12-2MT0 6ES7193-6CP13-2MT0

Overview



- 2, 4 and 8-channel analog input (AI) modules
 - Apart from the standard type of delivery in an individual 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 of unpacking individual modules.
- For different requirements, the digital output modules offer:
- Function classes Basic, Standard, High Feature and High Speed
 - BaseUnits for single or multiple-conductor connection with automatic slot coding
 - Potential distribution 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 of connecting current, voltage and resistance sensors, as well as thermocouples
 - Option of connecting force and torque sensors
 - Energy Meter for recording up to 200 electrical variables

- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (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 equidistant 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-conductor resistance measurement by means of adjustable line resistance
 - Calibration during runtime
 - Single-channel electrical isolation
 - HART communication
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis 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 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
 - Shielding terminal

A quick and clear comparison of the functions of the AI modules is offered by the TIA Selection Tool.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Overview (continued)

Overview of analog input modules

Analog input	PU	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-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 2xU/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 2 x SG 4/6-wire High Speed	1	7MH4134-6LB00-0DA0	CC00	A0
AI Energy Meter 400 V AC ST	1	6ES7134-6PA01-0BD0	--	D0
AI Energy Meter 480 V AC ST	1	6ES7134-6PA20-0BD0	--	D0

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--

Overview (continued)

BaseUnit	PU	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A1 • New load group (light) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New load group (light) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of load 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 load group (dark) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--
BU type D0 • Forwarding of load group (dark) • 12 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BD0	--	--

Overview of potential distribution modules

Potential distribution module	PU	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for beginning a new load group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for beginning a new load group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without connection 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

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications

Article number	6ES7134-6GF00-0AA1	6ES7134-6FB00-0BA1	6ES7134-6FF00-0AA1	6ES7134-6HD00-0BA1	6ES7134-6GB00-0BA1
	ET 200SP, AI 8xI 2-/4-WIRE BASIC	ET 200SP, AI 2xU STANDARD, PU 1	ET 200SP, AI 8xU BASIC	ET 200SP, AI 4xU/I 2-WIRE ST	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 4xU/I 2-wire ST	AI 2xI 2-/4-wire ST
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&M3	Yes; I&M0 to I&M3
• Measuring range scalable	No	No	No	No	No
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1	V13 SP1	V13 SP1	V11 SP2 / V13	V13 SP1
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3
• PCS 7 configurable/integrated as of version				V8.1 SP1	
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	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
Power loss					
Power loss, typ.	0.7 W; Without encoder supply voltage	0.9 W	0.7 W	0.85 W; Without encoder supply voltage	1.1 W
Analog inputs					
Number of analog inputs	8; Single-ended	2	8; Single-ended	4; Differential inputs	2
• For current measurement	8			4	2
• For voltage measurement		2	8	4	
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

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	6ES7134-6HD00-0BA1 ET 200SP, AI 4XU/I 2-WIRE ST	6ES7134-6GB00-0BA1 ET 200SP, AI 2XI 2-/4-WIRE ST, PU 1
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
• 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, 250 µs without filter
Smoothing of measured values					
• Number of smoothing levels	4; None; 4/8/16 times	4	4; None; 4/8/16 times	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
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No	No	No
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes		Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	No	No	No	No	No
Diagnostic messages					
• 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	Yes	Yes	Yes	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

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	6ES7134-6HD00-0BA1 ET 200SP, AI 4XU/I 2-WIRE ST	6ES7134-6GB00-0BA1 ET 200SP, AI 2XI 2-/4-WIRE ST, PU 1
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
Isolation					
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
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	6ES7134-6GD00-0BA1 ET 200SP, AI 4XI 2-/4-WIRE ST	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20MA HART	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 4xI 2-wire HART	AI 2xU/I 2-/4-wire HF	AI 2xU/I 2-/4-wire HS
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&M3
• Measuring range scalable	No	No	No	No
• Scalable measured values				No
• Adjustment of measuring range				No
Engineering with				
• STEP 7 TIA Portal configurable/integrated as of version	V11 SP2 / V13	V13 SP1	V13	V13 SP1
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP4 and higher	V5.5 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version	V8.1 SP1	V8.1 SP1	V8.1 SP1	
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• Oversampling	No	No	No	Yes; 2 channels per module
• MSI	No	No	Yes	No
CIr – Configuration in RUN				
Reparameterization possible in RUN	Yes	Yes	Yes	Yes
Calibration possible in RUN	No	No	Yes	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	4; Differential inputs	4; Differential inputs	2; Differential inputs	2; Differential inputs
• For current measurement	4	4	2	2
• For voltage measurement			2	2

Technical specifications (continued)

Article number	6ES7134-6GD00-0BA1 ET 200SP, AI 4XI 2-/4-WIRE ST	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20MA HART	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
permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max. Cycle time (all channels), min.	50 mA Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	50 mA	30 V 50 mA	30 V 50 mA 125 µs
Analog input with oversampling • Values per cycle, max. • Resolution, min. Standardization of measured values			No Yes	Yes 16 50 µs
Input ranges (rated values), voltages • 0 to +10 V • 1 V to 5 V • -10 V to +10 V • -5 V to +5 V			Yes; 15 bit Yes; 15 bit Yes; 16 bit incl. sign Yes; 16 bit incl. sign	Yes; 15 bit Yes; 13 bit Yes; 16 bit incl. sign Yes; 15 bit incl. sign
Input ranges (rated values), currents • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA	Yes Yes Yes	No No Yes; 15 bit + sign	Yes; 15 bit Yes; 16 bit incl. sign Yes; 15 bit	Yes; 15 bit Yes; 16 bit incl. sign Yes; 14 bit
Cable length • shielded, max.	1 000 m	800 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. • Integration time, parameterizable • Integration time (ms) • Basic conversion time, including integration time (ms) • Interference voltage suppression for interference frequency f1 in Hz • Conversion time (per channel) • Basic execution time of the module (all channels released)	16 bit Yes 16.6 / 50 / 60 Hz 180 / 60 / 50 ms	16 bit Yes; channel by channel 10 / 50 / 60 Hz	16 bit Yes 67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms 68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms 16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800 68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms 1 ms	16 bit No 10 µs
Smoothing of measured values • Number of smoothing levels • parameterizable	4; None; 4/8/16 times Yes	4; None; 4/8/16 times Yes	6; none; 2-/4-/8-/16-/32-fold Yes	7; none; 2-/4-/8-/16-/32-/64-fold Yes
Encoder Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer - Burden of 2-wire transmitter, max. • for current measurement as 4-wire transducer	No Yes 650 Ω Yes	No Yes	Yes Yes 650 Ω Yes	Yes Yes 650 Ω Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	6ES7134-6GD00-0BA1 ET 200SP, AI 4XI 2-/4-WIRE ST	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20MA HART	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
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 %	0.3 %	0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	60 dB		
• Common mode voltage, max.	10 V		35 V	35 V
• Common mode interference, min.	90 dB		90 dB	90 dB
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	Yes	Yes
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	Yes	
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No	Yes	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnostic messages				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes;
• Wire-break	Yes; at 4 to 20 mA	Yes; channel by channel	Yes; Measuring range 4 to 20 mA only	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, 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	Yes
• Overflow/underflow	Yes	Yes; channel by channel	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 PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	Yes; red LED	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
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Isolation				
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Standards, approvals, certificates				
Suitable for safety functions	No		No	No
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	31 g	31 g	32 g	32 g

Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1	6ES7134-6JD00-0CA1
	ET 200SP, AI 8xRTD/TC 2-WIRE HF	ET 200SP, AI 4xRTD/TC 2-/3-/4-WIRE HF
General information		
Product type designation	AI 8xRTD/TC 2-wire HF	AI 4xRTD/TC 2-/3-/4-wire HF
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 as of version	V13	V12 SP1 / V13
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / V5.5 SP4
• PCS 7 configurable/integrated as of version		V8.1 SP1
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3
Operating mode		
• Oversampling	No	No
• MSI	No	No
CiR – Configuration in RUN		
Reparameterization possible in RUN	Yes	Yes
Calibration possible in RUN	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Analog inputs		
Number of analog inputs	8	4
• For voltage measurement	8	4
• For resistance/resistance thermometer measurement	8	4
• For thermocouple measurement	8	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V
Constant measurement current for resistance-type transmitter, typ.	2 mA	0.7 mA; 1.7 mA for Cu10 sensors
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
Technical unit for temperature measurement adjustable	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
• -250 mV to +250 mV	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
• -80 mV to +80 mV	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

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1	6ES7134-6JD00-0CA1
	ET 200SP, AI 8XRTD/TC 2-WIRE HF	ET 200SP, AI 4XRTD/TC 2-/3-/4-WIRE HF
Input ranges (rated values), resistance thermometer • Cu 10 • Ni 100 • Ni 1000 • LG-Ni 1000 • Ni 120 • Ni 200 • Ni 500 • Pt 100 • Pt 1000 • Pt 200 • Pt 500	Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign	Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign
Input ranges (rated values), resistors • 0 to 150 ohms • 0 to 300 ohms • 0 to 600 ohms • 0 to 3000 ohms • 0 to 6000 ohms • PTC	Yes; 15 bit Yes; 15 bit Yes; 15 bit Yes; 15 bit Yes; 15 bit Yes; 15 bit	Yes; 15 bit Yes; 15 bit Yes; 15 bit Yes; 15 bit Yes; 15 bit Yes; 15 bit
Thermocouple (TC) Temperature compensation - parameterizable	Yes	Yes
Cable length • shielded, max.	200 m; 50 m with thermocouples	200 m; 50 m with thermocouples
Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Basic conversion time, including integration time (ms) - additional processing time for wire-break check - additional power line wire-break check • Interference voltage suppression for interference frequency f1 in Hz • Conversion time (per channel)	16 bit Yes 2 ms; In the ranges resistance thermometers, resistors and thermocouples 16.6 / 50 / 60 Hz 180 / 60 / 50 ms	16 bit Yes 2 ms; In the ranges resistance thermometers, resistors and thermocouples 2 ms; for 3/4 wire transducer (resistance thermometer and resistor) 16.6 / 50 / 60 Hz 180 / 60 / 50 ms
Smoothing of measured values • Number of smoothing levels • parameterizable	4; None; 4/8/16 times Yes	4; None; 4/8/16 times Yes
Encoder Connection of signal encoders • for voltage measurement • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection	Yes Yes No No	Yes Yes Yes Yes
Errors/accuracies Basic error limit (operational limit at 25 °C) • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-)	0.05 % 0.05 %	0.05 % 0.05 %

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
Interference voltage suppression for $f = n \times (f_1 \pm 1\%)$, $f_1 =$ interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	70 dB
• Common mode voltage, max.	10 V	10 V
• Common mode interference, min.	90 dB	90 dB
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	No	No
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
Diagnostic messages		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes
• Overflow/underflow	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
• 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
Isolation		
Isolation tested with	707 V DC (type test)	707 V DC (type test)
Standards, approvals, certificates		
Suitable for safety functions	No	No
Dimensions		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	32 g	30 g

Article number	7MH4134-6LB00-0DA0 ET 200SP AI 2 X SG 4-/6-WIRE HS
General information	
Product type designation	AI 2xSG 4-/6-wire HS
Product function	
• I&M data	Yes; I&M0 to I&M3
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	Yes; $\pm 0.5 \dots 320$ mV/V
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1
• STEP 7 configurable/integrated as of version	V5.6
• PROFIBUS as of GSD version/ GSD revision	V03.01.105
• PROFINET as of GSD version/ GSD revision	GSDML V2.33

Article number	7MH4134-6LB00-0DA0 ET 200SP AI 2 X SG 4-/6-WIRE HS
Operating mode	
• Oversampling	Yes; 2 channels per module
• MSI	No
CiR – Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	2; Differential inputs
Cycle time (all channels), min.	100 μ s
Analog input with oversampling	Yes
• Values per cycle, max.	14
• Resolution, min.	100 μ s

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	7MH4134-6LB00-0DA0 ET 200SP AI 2 X SG 4-/6-WIRE HS
Input ranges	
• Strain gauges (full bridges)	Yes
Cable length	
• shielded, max.	500 m
Analog value generation for the inputs	
Measurement principle	Sigma Delta
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
Smoothering 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-conductor connection (referred to end value)	≤ ±5 ppm/K
Temperature coefficient, span, 6-conductor connection (referred 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	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	87 µs
Bus cycle time (TDP), min.	125 µs

Article number	7MH4134-6LB00-0DA0 ET 200SP AI 2 X SG 4-/6-WIRE HS
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
Diagnostic messages	
• 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
Isolation	
Isolation tested with	707 V DC (type test)
Standards, approvals, certificates	
Suitable for safety functions	No
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.	45 g

Technical specifications (continued)

Article number	6ES7134-6PA01-0BD0 ET 200SP AI ENERGY METER 400VAC ST	6ES7134-6PA20-0BD0 ET 200SP AI ENERGY METER 480VAC ST
General information		
Product type designation	AI energy meter 400VAC ST	AI Energy Meter 480VAC ST
Product function		
• Voltage measurement	Yes	Yes
- without voltage transformer		Yes
- with voltage transformer	No	Yes
• Current measurement	Yes	Yes
- without current transformer	No	No
- with current transformer	Yes	Yes
- with Rogowski coil		No
- with current/voltage transformer		No
• Energy measurement	Yes	Yes
• Frequency measurement	Yes	Yes
• Power measurement	Yes	Yes
• Active power measurement	Yes	Yes
• Reactive power measurement	Yes	Yes
• Power factor measurement		Yes
• Active factor measurement		No
• Reactive power compensation		No
• Line analysis		No
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1	V13 SP1
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher	V5.5 SP4 and higher
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	V2.3	V2.3
Operating mode		
• cyclic measurement	Yes	
• acyclic measurement	Yes	
• Cyclic measured value access		Yes
• Acyclic measured value access	Yes	Yes
• Fixed measured value sets	Yes	Yes
• Freely definable measured value sets	No	Yes
CiR – Configuration in RUN		
Reparameterization possible in RUN	Yes	Yes
Calibration possible in RUN	No	Yes
Installation type/mounting		
Mounting position	Any	Any
Supply voltage		
Design of the power supply	Supply via voltage measurement channel L1	Supply via voltage measurement channel L1
Type of supply voltage	100 - 240 V AC	AC 100 - 277 V
permissible range, lower limit (AC)	90 V	90 V
permissible range, upper limit (AC)	264 V	293 V
Line frequency		
• permissible range, lower limit	47 Hz	47 Hz
• permissible range, upper limit	63 Hz	63 Hz
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)
Cable length		
• unshielded, max.		200 m
Isochronous mode		
Isochronous operation (application synchronized up to terminal)		No

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications (continued)

Article number	6ES7134-6PA01-0BD0 ET 200SP AI ENERGY METER 400VAC ST	6ES7134-6PA20-0BD0 ET 200SP AI ENERGY METER 480VAC ST
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	No	Yes
• Hardware interrupt	No	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
Diagnostics indication LED		
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red Fn LED	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Integrated Functions		
Measuring functions		
• Measuring procedure for voltage measurement	TRMS	TRMS
• Measuring procedure for current measurement	TRMS	TRMS
• Type of measured value acquisition	seamless	seamless
• Curve shape of voltage	Sinusoidal or distorted	Sinusoidal or distorted
• Buffering of measured variables	No	Yes
• Parameter length	38 byte	74 byte
• Bandwidth of measured value acquisition	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz
Measuring range		
- Frequency measurement, min.	45 Hz	45 Hz
- Frequency measurement, max.	65 Hz	65 Hz
Measuring inputs for voltage		
- Measurable line voltage between phase and neutral conductor	230 V	277 V
- Measurable line voltage between the line conductors	400 V	480 V
- Measurable line voltage between phase and neutral conductor, min.	90 V	90 V
- Measurable line voltage between phase and neutral conductor, max.	264 V	293 V
- Measurable line voltage between the line conductors, min.	155 V	155 V
- Measurable line voltage between the line conductors, max.	460 V	508 V
- 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	CAT II; CAT III in case of guaranteed protection level of 1.5 kV
- Internal resistance line conductor and neutral conductor	3.4 MΩ	3.4 MΩ
- Power consumption per phase	20 mW	20 mW
- Impulse voltage resistance 1,2/50μs	1 kV	1 kV

Technical specifications (continued)

Article number	6ES7134-6PA01-0BD0 ET 200SP AI ENERGY METER 400VAC ST	6ES7134-6PA20-0BD0 ET 200SP AI ENERGY METER 480VAC ST
Measuring inputs for current		
- measurable relative current (AC), min.	5 %; Relative to the secondary rated current; 1 A, 5 A	1 %; Relative to the secondary rated current 5 A
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current; 1 A, 5 A	100 %; Relative to the secondary rated current 5 A
- Continuous current with AC, maximum permissible	5 A	5 A
- Apparent power consumption per phase for measuring range 5 A	0.6 V·A	0.6 V·A
- 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
- Zero point suppression	Parameterizable: 20 ... 250 mA, default 50 mA	Parameterizable: 2 ... 250 mA, default 50 mA
- Surge strength	10 A; for 1 minute	10 A; for 1 minute
Accuracy class according to IEC 61557-12		
- Measured variable voltage	0.5	0.2
- Measured variable current	0.5	0.2
- Measured variable apparent power	1	0.5
- Measured variable active power	1	0.5
- Measured variable reactive power	1	1
- Measured variable power factor	0.5	0.5
- Measured variable active energy	1	0.5
- Measured variable reactive energy	2	1
- Measured variable neutral current		0.5; calculated
- Measured variable phase angle	±1 °; not covered by IEC 61557-12	±1 °; not covered by IEC 61557-12
- Measured variable frequency	0.05	0.05
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes; 3 700V AC (type test) CAT III	Yes; 3 700V AC (type test) CAT III
Isolation		
Isolation tested with	2 300V AC for 1 min. (type test)	2 300V AC for 1 min. (type test)
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
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude		On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight (without packaging)	45 g	45 g
Other		
Data for selecting a voltage transformer		
• Secondary side, max.		296 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

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Ordering data

Article No.

Article No.

Analog input modules

Type of delivery:
Apart from the standard type of delivery in an individual 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 of unpacking individual modules.

The number of modules required is the number of modules ordered. The type of packaging is chosen by selecting the article number. 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, $\pm 0.3\%$

- 1 unit
- 10 units

6ES7134-6HD00-0BA1
6ES7134-6HD00-2BA1

Analog input module
AI 2xI 2/4-wire Standard, BU type A0 or A1, color code CC05, 16-bit

6ES7134-6GB00-0BA1

Analog input module
AI 4xI 2/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, $\pm 0.3\%$

6ES7134-6GD00-0BA1

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, $\pm 0.1\%$, independent channel 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, $\pm 0.3\%$, isochronous mode above 250 μ s, oversampling above 50 μ s

6ES7134-6HB00-0DA1

Analog input module
AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.1\%$, scalable measuring range

- 1 unit
- 10 units

6ES7134-6JF00-0CA1
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, $\pm 0.1\%$, scalable measuring range

- 1 unit
- 10 units

6ES7134-6JD00-0CA1
6ES7134-6JD00-2CA1

Analog input module
AI 2xSG, 4/6-wire High Speed, BU type A0, color code CC00, channel diagnostics, 28/16-bit, $\pm 0.05\%$, for DMS full bridges; for connecting force and torque sensors

7MH4134-6LB00-0DA0

Analog input module
AI Energy Meter Standard, 400 V AC, BU type D0

6ES7134-6PA01-0BD0

Analog input module
AI Energy Meter Standard, 480 V AC, BU type D0

6ES7134-6PA20-0BD0

Usable 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 load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP20-0DA0
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)

- 1 unit
- 10 units

6ES7193-6BP00-0DA0
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

- 1 unit
- 10 units

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

Usable 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 jumpered 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 an additional 2x5 internally jumpered 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

Ordering data	Article No.		Article No.
Usable type D0 BaseUnits		Color-coded labels	
BU20-P12+A0+0B	6ES7193-6BP00-0BD0	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
BU type D0; BaseUnit with 12 push-in terminals, without AUX terminals, bridged to the left		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
Potential distribution modules		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
PotDis BU		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
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for beginning a new load group (max. 10 A)	6ES7193-6UP00-0DP1	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
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	6ES7193-6UP00-0BP1	Color code CC03, for 16 push-in 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
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for beginning a new load group (max. 10 A)	6ES7193-6UP00-0DP2	Color code CC05, for 16 push-in 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
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	6ES7193-6UP00-0BP2	Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	6ES7193-6CP71-2AA0
PotDis TB		Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	6ES7193-6CP72-2AA0
PotDis TB, type BR-W, 18x internally jumpered terminals, without connection to P1, P2 or AUX, (total current max. 10 A)	6ES7193-6TP00-0TP0	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	6ES7193-6CP73-2AA0
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	6ES7193-6TP00-0TP1	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
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	6ES7193-6TP00-0TP2	Color-coded labels for PotDis BU	
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-0TN0	Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	6ES7193-6CP62-2MA0
Accessories		Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	6ES7193-6CP63-2MA0
Equipment labeling plate	6ES7193-6LF30-0AW0	Color-coded labels for PotDis TB	
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter		Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units	6ES7193-6CP10-2MT0
Labeling strips		Color code CC11, for 18 process terminals, PotDis TB, yellow/green (terminals 1 to 18); 10 units	6ES7193-6CP11-2MT0
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	6ES7193-6CP12-2MT0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	6ES7193-6CP13-2MT0
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	6ES7193-6SC00-1AM0		
5 shield supports and 5 shield terminals			

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog output modules

Overview



- 2 and 4-channel analog output (AQ) modules
- Apart from the standard delivery form in an individual 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 of unpacking individual modules.

For different requirements, the digital 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, power supply and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - Oversampling (n-fold equidistant 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 equidistant output of analog values)
 - Output of substitute value in the event of interruptions to communication (shutdown, output adjustable substitute value, or keep last value)
 - Calibration during runtime
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis of wire break, short circuit, overflow, underflow
 - Value status (optional binary validity information of the analog signal in the process image)
 - Support of the PROFINergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding 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	PU	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	1	6ES7135-6HB00-0DA1	CC00	A0, A1
With two operating modes				
• High-speed isochronous AQ				
• Oversampling				

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--

Overview (continued)

BaseUnit	PU	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New load group (light) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New load group (light) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of load 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 load group (dark) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--

Overview of potential distributor modules

Potential distributor module	PU	Article No.	CC codes for process terminals
PotDis-BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis-BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis-BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis-BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP2	CC00, CC63

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog output modules

Overview (continued)

Potential distributor module	PU	Article No.	CC codes for process terminals
PotDis-TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 and 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 and AUX	1	6ES7193-6TP00-0TN0	CC10

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					
• 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	Yes; I&M0 to I&M3
• Output range scalable	No	No	No		
Engineering with					
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1 / -	V13 SP1 / -	V11 SP2 / V13	V13 SP1	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version			V8.1 SP1		V8.1 SP1
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of 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
CiR – Configuration in RUN					
Reparameterization possible in RUN	Yes	Yes	Yes	Yes	Yes
Calibration possible in RUN	No	No	No	Yes	Yes
Supply voltage					
Type of supply voltage	DC	DC	DC	DC	DC
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)	

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
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
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					
Isochronous operation (application synchronized up to terminal)	No	No	No	Yes	Yes
Execution and activation time (TCO), min.				70 μs	500 μs
Bus cycle time (TDP), min.				125 μs	750 μs

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog output modules

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
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
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break		Yes	Yes	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes		Yes	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	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	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
Isolation					
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C; Observe derating	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C	50 °C; Observe derating	50 °C	50 °C
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

Ordering data	Article No.		Article No.
Analog output modules		Usable type A1 BaseUnits (temperature detection)	
Analog output module AQ 2xU Standard, BU type A0 or A1, color code CC00, 16-bit	6ES7135-6FB00-0BA1	BU15-P16+A0+12D/T	6ES7193-6BP40-0DA1
Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit	6ES7135-6GB00-0BA1	BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC00, 16-bit, ± 0.3%	6ES7135-6HD00-0BA1	BU15-P16+A0+2D/T	6ES7193-6BP00-0DA1
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%	6ES7135-6HB00-0CA1	BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16-bit, ±0.3%	6ES7135-6HB00-0DA1	BU15-P16+A0+12B/T	6ES7193-6BP40-0BA1
Usable type A0 BaseUnits		BU type A1; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	
Type of delivery: Apart from the standard type of delivery in an individual 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 of unpacking individual modules.		BU15-P16+A0+2B/T	6ES7193-6BP00-0BA1
The number of modules required is the number of modules ordered. The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.		Potential distributor modules	
BU15-P16+A10+2D		PotDis-BU	
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)		PotDis-BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	6ES7193-6UP00-0DP1
• 1 unit	6ES7193-6BP20-0DA0	PotDis-BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	6ES7193-6UP00-0BP1
• 10 units	6ES7193-6BP20-2DA0	PotDis-BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	6ES7193-6UP00-0DP2
BU15-P16+A0+2D		PotDis-BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	6ES7193-6UP00-0BP2
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)		PotDis-TB	
• 1 unit	6ES7193-6BP00-0DA0	PotDis-TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 and AUX, (total current max. 10 A)	6ES7193-6TP00-0TP0
• 10 units	6ES7193-6BP00-2DA0	PotDis-TB, type P1-R, 18x P1 potential, (total current max. 10 A)	6ES7193-6TP00-0TP1
BU15-P16+A10+2B		PotDis-TB, type P2-B, 18x P2 potential, (total current max. 10 A)	6ES7193-6TP00-0TP2
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		PotDis-TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 and AUX	6ES7193-6TP00-0TN0
• 1 unit	6ES7193-6BP20-0BA0		
• 10 units	6ES7193-6BP20-2BA0		
BU15-P16+A0+2B			
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group			
• 1 unit	6ES7193-6BP00-0BA0		
• 10 units	6ES7193-6BP00-2BA0		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog output modules

Ordering data	Article No.		Article No.
Accessories		Color-coded labels for PotDis-BU	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0	Color code CC62, for 16 process terminals, PotDis-BU type P1, red (terminals 1 to 16); 10 units	6ES7193-6CP62-2MA0
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Color code CC63, for 16 process terminals, PotDis-BU type P2, blue (terminals 1 to 16); 10 units	6ES7193-6CP63-2MA0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	Color-coded labels for PotDis-TB	
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0	Color code CC10, for 18 process terminals, PotDis-TB, gray (terminals 1 to 18); 10 units	6ES7193-6CP10-2MT0
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0	Color code CC11, for 18 process terminals, PotDis-TB, yellow-green (terminals 1 to 18); 10 units	6ES7193-6CP11-2MT0
BU cover for covering empty slots (gaps); 5 units		Color code CC12, for 18 process terminals, PotDis-TB, type P1 and BR, red (terminals 1 to 18); 10 units	6ES7193-6CP12-2MT0
• 15 mm	6ES7133-6CV15-1AM0	Color code CC13, for 18 process terminals, PotDis-TB, type P2 and BR, blue (terminals 1 to 18); 10 units	6ES7193-6CP13-2MT0
• 20 mm	6ES7133-6CV20-1AM0		
Shield connection 5 shield supports and 5 shield terminals	6ES7193-6SC00-1AM0		
Color-coded labels Color code CC00, for 16 process terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	6ES7193-6CP00-2MA0		
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 termi- nals, 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		

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 rating plate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
 - Labeling strips
 - Equipment marking label
 - Color-coded label with module-specific CC code
 - Shielding terminal

Overview of digital output modules

Digital output	Article No.	CC code	BU type	PU
DQ 16 x 24 V DC/0.5 A ST	6AG1132-6BH00-7BA0	CC00	A0	1
DQ 8 x 24 V DC/0.5 A ST	6AG1132-6BF00-7BA0	CC02	A0	1
DQ 8 x 24 V DC/0.5 A HF	6AG1132-6BF00-7CA0	CC02	A0	1
DQ 4 x 24 V DC/2 A ST	6AG1132-6BD20-7BA0	CC02	A0	1
RQ 4 x 24 V UC/2 A CO ST	6AG1132-6GD50-2BA0	CC00	A0	1
RQ 4 x 120 V DC-230 V AC/5 A NO ST	6AG1132-6HD00-7BB1	CC00	B0	1

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.

Technical specifications

Article number based on	6AG1132-6BD20-7BA0 6ES7132-6BD20-0BA0 SIPLUS ET200SP DQ 4x24VDC/2A ST	6AG1132-6BF00-7BA0 6ES7132-6BF00-0BA0 SIPLUS ET 200SP DQ 8x24VDC/0.5A ST	6AG1132-6BH00-7BA0 6ES7132-6BH00-0BA0 SIPLUS ET 200SP DQ 16x24VDC/0.5A ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 2 x 0.25 A or max. 4 x 0.125 A, max. total current 0.5 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C	-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)

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Technical specifications (continued)

Article number based on	6AG1132-6BD20-7BA0 6ES7132-6BD20-0BA0 SIPLUS ET200SP DQ 4x24VDC/2A ST	6AG1132-6BF00-7BA0 6ES7132-6BF00-0BA0 SIPLUS ET 200SP DQ 8x24VDC/0.5A ST	6AG1132-6BH00-7BA0 6ES7132-6BH00-0BA0 SIPLUS ET 200SP DQ 16x24VDC/0.5A ST
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	Yes	Yes
Use in stationary industrial systems - to biologically active substances according to EN 60721-3-3 - to chemically active substances according to EN 60721-3-3 - to mechanically 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 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea - to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S4 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S4 incl. sand, dust; *	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S4 incl. sand, dust; *
Note - Note regarding classification of environmental conditions acc. to EN 60721	* 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!

Article number based on	6AG1132-6BF00-7CA0 6ES7132-6BF00-0CA0 SIPLUS ET 200SP DQ 8X24VDC/0.5A HF	6AG1132-6GD50-2BA0 6ES7132-6GD50-0BA0 SIPLUS ET 200SP RQ 4X24VDC/2A CO ST	6AG1132-6HD00-7BB1 6ES7132-6HD00-0BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A
Ambient conditions			
Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max.	-40 °C; = Tmin 70 °C; = Tmax; > +60 °C max. total current 1.0 A -40 °C; = Tmin 50 °C; = Tmax	-40 °C; = Tmin; Startup @ -25 °C 60 °C; = Tmax	-40 °C; = Tmin 70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. continuous current of 3 A per relay
Altitude during operation relating to sea level • Installation altitude above sea level, max. • Ambient air temperature-barometric pressure-altitude	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)	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)	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 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

Technical specifications (continued)

Article number based on	6AG1132-6BF00-7CA0 6ES7132-6BF00-0CA0 SIPLUS ET 200SP DQ 8X24VDC/0.5A HF	6AG1132-6GD50-2BA0 6ES7132-6GD50-0BA0 SIPLUS ET 200SP RQ 4X24VDC/2A CO ST	6AG1132-6HD00-7BB1 6ES7132-6HD00-0BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A
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 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C4 (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 6S4 incl. sand, dust; *	Yes; Class 6S4 incl. sand, dust; *	Yes; Class 6S4 incl. sand, dust; *
Notes			
- Note regarding classification of environmental conditions acc. to EN 60721	* 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!

Article number based on	6AG1132-6BD20-7CA0 6ES7132-6BD20-0CA0 SIPLUS ET 200SP DQ 4X24VDC/2A HF
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. total current 1 A
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

Article number based on	6AG1132-6BD20-7CA0 6ES7132-6BD20-0CA0 SIPLUS ET 200SP DQ 4X24VDC/2A HF
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 6C4 (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 6S4 incl. sand, dust; *
Notes	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Ordering data	Article No.	Article No.
SIPLUS digital output modules		Usable SIPLUS BaseUnits
(Extended temperature range and exposure to media)		
Digital output module DQ 4x24 V DC/2 A Standard, BU type A0, color code CC02	6AG1132-6BD20-7BA0	BU15-P16+A0+2D 6AG1193-6BP00-7DA0 (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)
Digital output module DQ 8x24 V DC/0.5 A Standard, BU type A0, color code CC02	6AG1132-6BF00-7BA0	BU15-P16+A0+2B 6AG1193-6BP00-7BA0 (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group
Digital output module DQ 8x24 V DC/0.5 A High Feature, BU type A0, color code CC02	6AG1132-6BF00-7CA0	
Digital output module DQ 16x24 V DC/0.5 A Standard, BU type A0, color code CC00	6AG1132-6BH00-7BA0	
Digital output module DQ 4x24 V DC/2 A High Feature, BU type A0, color code CC02, channel-precise diagnostics, isochronous mode, shared output (MSO); PU: 1 unit	6AG1132-6BD20-7CA0	BU15-P16+A10+2D 6AG1193-6BP20-7DA0 (Extended temperature range and exposure to media) 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)
Signal relay module RQ CO 4x24 V UC/2 A Standard, changeover contact, BU type A0, color code CC00	6AG1132-6GD50-2BA0	
Relay module RQ NO 4x120 V DC - 230 V AC/5 A Standard, normally open, BU type B0, color code CC00	6AG1132-6HD00-7BB1	BU15-P16+A10+2B 6AG1193-6BP20-7BA0 (Extended temperature range and exposure to media) 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
		BU20-P12+A4+0B 6AG1193-6BP20-7BB0 (Extended temperature range and exposure to media) 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 load group; 1 unit
		Accessories See SIMATIC ET 200SP, digital output modules

Overview

SIPLUS and SIMATIC Electrical Charge Controller are the key components in infrastructure solutions for the conductive charging of electric vehicles.

They perform the following functions:

- Detection of the charging cable and its permissible current carrying capacity
- Transfer of the maximum charging current from the charging station to the electric vehicle
- Evaluation of the status signals from the electric vehicle:
 - Ready for charging
 - Charging
 - Charging with ventilation

- Control of load tap-off
- Control of connector lock
- Evaluation of connector lock or load contactor status
- Cost-optimized, space-saving charging infrastructure solutions due to compact design based on SIMATIC ET 200SP
- Control of charging outputs according to IEC 61851 by parameterizable SIMATIC ET 200SP TM ECC 2xPWM ST charge controller

Technical specifications

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST
General information	
Product brand name	SIMATIC
Product designation	Charging controller for the conductive charging of electric vehicles
Number of channels	2; According to IEC 61851/SAE J1772
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1
Installation type/mounting	
Mounting type	standard rail
Mounting position	Horizontal
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes; against destruction
Input current	
Current consumption, typ.	40 mA
Current consumption, max.	90 mA
Digital inputs	
Number of digital inputs	2; 1 per channel
Digital inputs, parameterizable	Yes; 12 V / 24 V
Digital input functions, parameterizable	
• Freely usable digital input	No; Readback contact contactor / connector lock
Input voltage	
• Type of input voltage	DC
• for signal "0"	<0.2 V (nom)
• for signal "1"	>0.6 V (nom)
• permissible voltage at input, min.	0 V
• permissible voltage at input, max.	30 V
Cable length	
• unshielded, max.	30 m

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2; 1 per channel
short-circuit proof	Yes
Short-circuit protection	Yes; electronic/thermal
Digital output functions, parameterizable	
• PWM output	Yes; According to IEC 61851
- Number, max.	2; 1 per channel
• Connection of a DC motor	Yes; ACT p/n connector locking
Switching capacity of the outputs	
• with resistive load, max.	1.3 A
Output voltage	
• Type of output voltage	DC
• Output voltage, min.	24 V
Cable length	
• unshielded, max.	30 m
Protocols	
Bus communication	Yes
Vehicle communication according to IEC 61851	Yes; MODE 3
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	No
• Short-circuit	Yes
Diagnostics indication LED	
• ERROR LED	Yes; red 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	No
• between the channels and backplane bus	Yes
Isolation	
Isolation tested with	707 V DC
Degree of pollution	2

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

Technical specifications (continued)

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST
EMC	
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV signal lines
Conducted interference due to surge acc. to IEC 61000-4-5	On DC supply lines: 0.5 kV symmetrical and asymmetrical
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
Certificate of suitability	CE
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	60 °C
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	70 °C
• Transportation, min.	-40 °C
• Transportation, max.	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)
Relative humidity	
• Operation, min.	5 %
• Operation, max.	95 %; no condensation
Vibrations	
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g
Shock testing	
• Shock resistance acc. to IEC 60068-2-27	15 g / 11 ms
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	32 g

Ordering data

Article No.

Charging controller
SIMATIC ET200SP
TM ECC 2xPWM S

Designed for controlling charging outputs according to IEC 61851 and parameterizable, with 2 charging outputs, ambient temperature -30°C...60°C, 2x control pilot, 2x plug present, 2x DQ switching contact for load contactor as open collector, 2x DI for load contactor feedback or connector lock;

6FE1242-6TM10-0BB1

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 bit
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor 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 respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number based on	6AG1138-6AA00-2BA0 6ES7138-6AA00-0BA0 SIPLUS ET 200SP TM COUNT 1X24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin; Startup @ -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
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 6C4 (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 6S4 incl. sand, dust; *
Notes	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Count 1x24V counter module

Ordering data	Article No.		Article No.
SIPLUS TM Count 1x24V counter module (Extended temperature range and medial exposure) With one channel, max. 200 kHz; for 24 V encoder	6AG1138-6AA00-2BA0	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)	6AG1193-6BP20-7DA0
Usable BaseUnits (Extended temperature range and medial exposure)		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	6AG1193-6BP20-7BA0
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	Further accessories	See catalog ST 70, SIMATIC TM Count 1x24V counter module
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0		

Overview



Technical properties

- Counting 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
- Counter frequency 1 MHz (4 MHz with four-fold evaluation)
- Counting range: +/- 31 bit
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- Incremental encoders with or 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 bit, of which up to 31 bit 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 respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number based on	6AG1138-6BA00-2BA0 6ES7138-6BA00-0BA0 SIPLUS ET 200SP TM POSINPUT 1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax; see Derating BasedOn (e.g. manual)
• vertical installation, min.	0 °C
• 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
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 6C4 (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 6S4 incl. sand, dust; *
Notes	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM PosInput 1 counting and position detection module

Ordering data	Article No.		Article No.
SIPLUS TM PosInput 1 counting and position detection module (Extended temperature range and exposure to environmental substances) With one channel, max. 1 MHz for 5 V TTL or RS 422 differential signals or SSI absolute encoder	6AG1138-6BA00-2BA0	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)	6AG1193-6BP20-7DA0
Usable BaseUnits (Extended temperature range and exposure to environmental substances)		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	6AG1193-6BP20-7BA0
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	Other accessories	See catalog ST 70, TM PosInput 1 counting and position detection module
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0		

Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with μ s accuracy
- Outputs for outputting the switching signals with μ s 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 respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number based on	6AG1138-6CG00-2BA0 6ES7138-6CG00-0BA0 SIPLUS ET 200SP TM TIMER DIDQ 10x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	60 °C; = Tmax; see Derating BasedOn (e.g. manual)
• vertical installation, min.	0 °C
• 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
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 6C4 (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 6S4 incl. sand, dust; *
Notes	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > Time-based IO module SIPLUS TM timer DIDQ 10x24 V

Ordering data	Article No.		Article No.
Time-based IO module SIPLUS TM timer DIDQ 10x24 V (Extended temperature range and exposure to environmental substances) 4 time-controlled inputs, 6 time-controlled outputs	6AG1138-6CG00-2BA0	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)	6AG1193-6BP20-7DA0
Usable BaseUnits (Extended temperature range and exposure to environmental substances)		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	6AG1193-6BP20-7BA0
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	Other accessories See catalog ST 70, SIMATIC TM Timer DIDQ 10x24 V time-based IO module	
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0		

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 24V channels, 2A output current can be switched in parallel to boost performance to 4A 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. Temperature influences can thus be balanced to the resistance of the actuator.
 - Cyclic control of the respective main setpoint from the PLC in every operating mode; other values can be modified flexibly from the user program.
- 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 respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number based on	6AG1138-6DB00-2BB1 6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM PULSE 2x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, max.	50 °C; Observe derating
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
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 6C4 (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 6S4 incl. sand, dust; *
Notes	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Pulse 2x24V pulse output module

Ordering data	Article No.
SIPLUS TM Pulse 2x24V pulse output module (Extended temperature range and medial exposure) PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors	6AG1138-6DB00-2BB1
Usable BaseUnits (Extended temperature range and medial exposure)	
BU20-P12+A0+4B BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group	6AG1193-6BP20-7BB1
Further accessories	See catalog ST 70, SIMATIC TM Pulse 2x24V pulse output module

Overview



- CM PtP communication module; module for serial communication connections with RS232 and RS422 interfaces. RS485 for the Freepoint, 3964(R), Modbus RTU, and USS protocols, max. 115.2 kbit/s, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
 - Freepoint: 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
- Interface properties
 - RS232 with auxiliary signals
 - RS422 for full-duplex connections
 - RS485 for half-duplex and multi-point connections
 - Transmission rates from 300 to 115200 bit/s
- 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
 - Reference identification label
- 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.

Technical specifications

Article number based on	6AG1137-6AA00-2BA0 6ES7137-6AA00-0BA0 SIPLUS ET 200SP CM PTP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax
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 - 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
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!

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM PtP serial interface

Ordering data	Article No.		Article No.
SIPLUS CM PtP communication module (Extended temperature range and medial exposure) PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS up to 12 Mbit/s for serial communication connections with the interfaces RS232, RS422, RS485, BU type A0, color code CC00	6AG1137-6AA00-2BA0	BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0
Accessories SIPLUS BaseUnits type A0 (Extended temperature range and medial exposure)		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 (1A to 10A); for starting a new load group (max. 10 A)	6AG1193-6BP20-7DA0
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+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1A to 10A); for continuing the load group	6AG1193-6BP20-7BA0
		Further accessories See catalog ST 70, SIMATIC CM PtP	

Overview



Digital fail-safe output modules:

- F-DQ 4x24VDC/2A PM High Feature
- F-DQ 8x24VDC/0.5A PP High Feature

Other properties:

- 4- and 8-channel digital fail-safe output modules for the ET 200SP

- Fail-safe 2-channel activation (sink/source output) 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
 - Reference identification label
- Optional system-integrated shield connection
- The modules support PROFI-safe in both PROFIBUS and PROFINET configurations
- They can be used with all fail-safe SIMATIC S7 CPUs

Technical specifications

Article number	6ES7136-6DB00-0CA0	6ES7136-6DC00-0CA0
	ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A	ET 200SP, F-DQ 8X 24VDC/0.5A PP
General information		
Product type designation	F-DQ 4x24 V DC/2 A PM HF	F-DQ 8x24 V DC/0.5 A PP HF
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 as of version	V12	V14 SP1 with HSP 202
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP4 HF5
• PROFINET as of GSD version/GSD revision	V2.31	
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Digital outputs		
Number of digital outputs	4	8
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes	No
Overload protection	Yes	
Limitation of inductive shutdown voltage to	Typ. -2x 47 V	Typ. -39 V
Controlling a digital input		Yes
Switching capacity of the outputs		
• with resistive load, max.	2 A	0.5 A
• on lamp load, max.	10 W	2 W
Load resistance range		
• lower limit	12 Ω	48 Ω
• upper limit	2 000 Ω	12 000 Ω

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output modules

Technical specifications (continued)

Article number	6ES7136-6DB00-0CA0 ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8X 24VDC/0.5A PP
Output voltage		
• Type of output voltage	DC	DC
• for signal "1", min.	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)
Output current		
• for signal "1" rated value	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Switching frequency		
• with resistive load, max.	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
• with capacitive load, max.		2 Hz; Symmetrical
• on lamp load, max.	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
• Current per module, max.	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
Cable length		
• shielded, max.	1 000 m	100 m
• unshielded, max.	500 m	100 m
Interrupts/diagnostics/status information		
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual	Yes, "Alarms/diagnostic messages" section in the manual
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	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 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
Isolation		
Isolation tested with	707 V DC (type test)	707 V DC (type test)
Standards, approvals, certificates		
Suitable for safety functions	Yes	Yes
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	PLe	PLe
• Category according to ISO 13849-1		Cat. 4
• SIL acc. to IEC 61508	SIL 3	SIL 3

Technical specifications (continued)

Article number	6ES7136-6DB00-0CA0 ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8X 24VDC/0.5A PP
Probability of failure (for service life of 20 years and repair time of 100 hours)		
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 6.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h	< 2.00E-09 1/h
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	
Depth	58 mm	
Weights		
Weight, approx.	57 g	48 g

Ordering data

Article No.

Article No.

Digital F output modules

F-DQ 4x24 V DC High Feature,
BU type A0, color code CC01**6ES7136-6DB00-0CA0**F-DQ 8x24 V DC High Feature,
PP-switching, BU type A0,
color code CC01**6ES7136-6DC00-0CA0**

Usable 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)

- 1 unit
- 10 units

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with
16 process terminals to the module;
for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

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)

- 1 unit
- 10 units

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0

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

- 1 unit
- 10 units

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

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 load group**6ES7193-6BP20-0BB0**

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 as of V5.5 SP1
Please also consider the operating
systems that have been released
for the used STEP 7 versionFloating 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
download¹⁾;
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⁾ For up-to-date information and download availability, see:
<http://www.siemens.com/tia-online-software-delivery>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output modules

Ordering data	Article No.		Article No.
STEP 7 Safety Advanced V15 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 V15 Floating license for 1 user, software and documentation on DVD; license key on USB flash drive Floating license for 1 user, software, documentation and license key for download ¹⁾ ; email address required for delivery			
Equipment labeling plate	6ES7833-1FA15-0YA5		
10 sheets of 16 labels	6ES7833-1FA15-0YH5		
Labeling strips			
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	BU cover	
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	For covering empty slots (gaps); 5 units	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0	• 15 mm wide • 20 mm wide	
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0	Shield connection	6ES7193-6SC00-1AM0
		5 shield supports and 5 shield terminals	
		Color-coded labels	
		• 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 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
		E-coding element type F	6ES7193-6EF00-1AA0
		5 units, spare part	

¹⁾ For up-to-date information and download availability, see:
<http://www.siemens.com/tia-online-software-delivery>

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 partners 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 particular product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability and makes no guarantee for these products or for the connection with these products of the product partners. Please refer also to the note on exemption from liability/use of hyperlinks.

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 installation & configuration of the pneumatic connections

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. The ET 200SP, in combination with the AirLINE SP, type 8647 from the Bürkert Co., 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 also be attached to a control cabinet floor with an AirLINE Quick Adapter, which further reduces the space required in the control cabinet, and significantly simplifies the pneumatic installation.

More information

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly:

<http://www.burkert.com/en/type/8647>

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.

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Power supplies > Single-phase, 24 V DC (for SIMATIC ET 200SP)

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 interface, technology and communication modules, as well as digital or analog inputs/outputs. Comprehensive certifications, such as UL, ATEX or GL, facilitate universal use. Its extremely flat design also makes this power supply ideally suited for installation in compact on-site control boxes.

Ordering data

Article No.

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

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 identification 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.

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	Type A0	Type A0	Type A0	BU type A0, dark version, without AUX terminals, PU 1
Accessories				
Color coding labels				
• for process terminals	CC00 to CC09	CC00 to CC09	CC00 to CC09	CC00 to CC09
• for AUX terminals	CC71 to CC73	does not exist	CC71 to CC73	does not exist
• for add-on terminals	does not exist	does not exist	does not exist	does not exist
Connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26
• Conductor cross-section, max.	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; 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	0	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

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BaseUnits

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	6ES7193-6BP20-0DC0 BASEUNIT TYPE C0, BU20-P6+A2+4D	6ES7193-6BP00-0BD0 BASEUNIT TYPE D0, BU20-P12+A0+0B	6ES7193-6BP20-0BF0 BASEUNIT TYPE F0, BU20-P8+A4+0B
General information					
Product type designation	Type B0	Type B1	Type C0	Type D0	Type F0
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	Type A1	Type A1	Type A1	Type A1
Accessories				
Color coding labels				
• for process terminals	CC00 to CC09	CC00 to CC09	CC00 to CC09	CC00 to CC09
• for AUX terminals	does not exist	does not exist	does not exist	does not exist
• for add-on terminals	CC74	does not exist	CC74	does not exist
Connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26	0.14 mm ² ; AWG 26
• Conductor cross-section, max.	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; AWG 14	2.5 mm ² ; 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	0	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

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, BU20-P16+A0+2D, PU 1	BU type U0, BU20-P16+A0+2B, PU 1
Connection method		
Terminals		
• Terminal type	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm ² ; 0.2 mm ² without wire end ferrule	0.14 mm ² ; 0.2 mm ² without wire end ferrule
• Conductor cross-section, max.	2.5 mm ² ; 1.5 mm ² with wire end ferrule	2.5 mm ² ; 1.5 mm ² 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

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
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	6ES7193-6BN00-0NE0 ET 200SP, BASEUNIT BU-SEND
Dimensions	
Width	20 mm
Height	117 mm
Depth	35 mm
Weights	
Weight, approx.	30 g

Ordering data**Article No.****Article No.****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 load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP20-0DA0
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)

- 1 unit
- 10 units

6ES7193-6BP00-0DA0
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

- 1 unit
- 10 units

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BA0
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 load group; 1 unit

- 1 unit
- 10 units

6ES7193-6BP20-0BB0
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 load group; 1 unit

6ES7193-6BP20-0BB1

Type C0 BaseUnits**BU20-P6+A2+4D**

BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group

6ES7193-6BP20-0DC0

Type D0 BaseUnits**BU20-P12+A0+0B**

BU type D0; BaseUnit (dark) with 12 push-in terminals, without AUX terminals, bridged to the left

6ES7193-6BP00-0BD0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BaseUnits

Ordering data

Article No.

Type A1 BaseUnits

(with 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 jumpered 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 an additional 2x5 internally jumpered 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

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 load 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 load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP00-0DU0
6ES7193-6BP00-2DU0

BU20-P16+A0+2B

BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BU0
6ES7193-6BP00-2BU0

Station expansion with IP67 I/O system ET 200AL

BaseUnit BU-Send

6ES7193-6BN00-0NE0

ET 200SP BusAdapter BA-Send 1 x FC

6ES7193-6AS00-0AA0

Article No.

Accessories

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

BU cover

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

6ES7133-6CV15-1AM0
6ES7133-6CV20-1AM0

Shield connection

5 shield supports and 5 shield terminals

6ES7193-6SC00-1AM0

Color-coded labels

- Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units
- Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units
- Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units
- Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, for BU type A1 with push-in terminals; 10 units
- Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units
- Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units
- Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units
- Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units
- Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units
- Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units
- Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units

6ES7193-6CP01-2MA0

6ES7193-6CP01-4MA0

6ES7193-6CP02-2MA0

6ES7193-6CP02-4MA0

6ES7193-6CP03-2MA0

6ES7193-6CP04-2MA0

6ES7193-6CP71-2AA0

6ES7193-6CP72-2AA0

6ES7193-6CP73-2AA0

6ES7193-6CP74-2AA0

6ES7193-6CP81-2AB0

6ES7193-6CP82-2AB0

6ES7193-6CP83-2AB0

6ES7193-6CP41-2MB0

6ES7193-6CP84-2AC0

6ES7193-6CP85-2AC0

6ES7193-6CP86-2AC0

Overview



ET 200SP BusAdapter (RJ45)



BA 2xFC BusAdapter

Some interface modules of the SIPLUS ET 200SP have a universal PROFINET interface for BusAdapters. With the appropriate bus adapter, the type of connection can be adapted to the requirements of the respective application:

- For standard applications with a moderate mechanical and EMC load, the BA 2xRJ45 BusAdapter is used. It offers two sockets for standard RJ45 plugs.
- For machines and systems in which higher mechanical and/or EMC loads act on the devices, the BA 2xFC BusAdapter is recommended. In this case, the bus cables are connected directly by means of FastConnect terminals – similar to the PROFIBUS connector, proven in millions of applications. The technology is extremely quick to assemble and achieves 5 times better vibration resistance and also 5 times greater resistance to electromagnetic interference, when compared to RJ45 plug connectors.
- BusAdapters with connections for fiber-optic cables can be used to cover high potential differences between two stations and/or high EMC loads.

Another advantage of the BusAdapters: In order to repair defective RJ45 sockets or for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, only the adapter needs to be replaced.

The following interface modules offer a PROFINET connection via BusAdapter:

- SIPLUS IM 155-6PN Standard
- SIPLUS IM 155-6PN High Feature

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.

Technical specifications

Article number based on	6AG1193-6AR00-7AA0 6ES7193-6AR00-0AA0 SIPLUS ET 200SP BA 2xRJ45	6AG1193-6AF00-7AA0 6ES7193-6AF00-0AA0 SIPLUS ET 200SP BA 2xFC PN	6AG1193-6AP00-2AA0 6ES7193-6AP00-0AA0 SIPLUS ET 200SP BA 2XSCRJ PN	6AG1193-6AG00-2AA0 6ES7193-6AG00-0AA0 SIPLUS ET 200SP BA 2XLC
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
• max.	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	60 °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 1 080 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)	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 60068-2-28, 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 in bedewed state), horizontal installation

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BusAdapters

Technical specifications (continued)

Article number based on	6AG1193-6AR00-7AA0 6ES7193-6AR00-0AA0 SIPLUS ET 200SP BA 2xRJ45	6AG1193-6AF00-7AA0 6ES7193-6AF00-0AA0 SIPLUS ET 200SP BA 2XFC PN	6AG1193-6AP00-2AA0 6ES7193-6AP00-0AA0 SIPLUS ET 200SP BA 2XSCRJ PN	6AG1193-6AG00-2AA0 6ES7193-6AG00-0AA0 SIPLUS ET 200SP BA 2XLC
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants			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 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!	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. 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!	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 6C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C4 (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 6S4 incl. sand, dust; *	Yes; Class 6S4 incl. sand, dust; *
Notes				
- Note regarding classification of environmental conditions acc. to EN 60721			* 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!

Ordering data

Article No.	Article No.
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
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 damping	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
Reference identification label 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0

Design



ET 200iSP modules can also be installed in stainless steel wall enclosures designed to meet more exacting protection requirements. The enclosures are available in various sizes. They comply with degree of protection IP65 and can be used in Ex zones 1 and 21.

Delivery is possible as an empty enclosure or including components, depending on the order.

Send your request to:

Siemens AG
PD PA AE SO
(please insert project name here)
Ostl. Rheinbrückenstr. 50
76187 Karlsruhe, Germany

Email: cabinets.industry@siemens.com

Ordering data

Article No.

Stainless steel enclosure IP65 for SIMATIC ET 200iSP

6DL2804- ■ ■ ■ ■ ■

I/O enclosure

Surface casing in stainless steel, max. IP66, with mounting plate and equipotential bonding rail, empty enclosure for installation of ET 200iSP components¹⁾

0

I/O device consisting of surface casing with installed ET 200iSP components²⁾

1

I/O device consisting of surface casing with installed ET 200iSP and pneumatic components²⁾

2

I/O device consisting of surface casing with installed ET 200iSP and additional components for zone 2³⁾

3

I/O device consisting of surface casing with installed ET 200iSP with pneumatic and additional components for zone 2³⁾

4

Device group

Device group II, up to zone 1 (including zone 2)

A

Device group II, up to zone 2 (not zone 1 and not zone 21)

B

Device group II, up to zone 21 (including zone 22)

D

Device group II, up to zone 22 (not zone 1 and not zone 21)

E

Device group I M2 (max. degree of protection IP55), for use in mining

M

Enclosure dimensions W × H × D (in mm)

650 × 450 × 230, for 15 ET 200iSP modules in non-redundant configuration

D

950 × 450 × 230, for 25 ET 200iSP modules in non-redundant configuration

E

650 × 450 × 350, for 15 ET 200iSP modules for non-redundant configuration

F

950 × 450 × 350, for 25 ET 200iSP modules for non-redundant configuration

G

800 × 800 × 300, for 2 rows with max. 30 ET 200iSP modules

K

800 × 1000 × 300, for 2 rows with max. 30 ET 200iSP modules

M

1000 × 1000 × 300, for 2 rows with max. 42 ET 200iSP modules

U

1000 × 1200 × 300, for 2 rows with max. 42 ET 200iSP modules

V

¹⁾ The supplied certificate is only valid for the empty enclosure.

²⁾ The included certificate is valid for the supplied enclosure including the installed components.

³⁾ The included manufacturer's declaration is valid for the supplied enclosure including the installed components.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Stainless steel wall enclosure

Ordering data

Article No.

Stainless steel enclosure IP65 for SIMATIC ET 200iSP

6DL2804-

Cable entries/number

6 × M25 for infeed, 6 or 9 × M32 (1 row) for signal lines⁹⁾

1

6 × M25 for infeed, 12 or 18 × M32 (2 rows) for signal lines⁹⁾

2

M16 cable entries for signals, 3 rows, 39 or 66 pcs.⁴⁾, 2 × M32 for power supply, 4 × M20 for bus cables⁵⁾

3

M20 cable entries for signals, 3 rows, 36 or 57 pcs.⁴⁾, 2 × M32 for power supply, 4 × M20 for bus cables⁵⁾

4

M16 cable entries for signals, 5 rows, 65 or 110 pcs.⁴⁾, 2 × M32 for power supply, 4 × M20 for bus cables⁵⁾

5

M20 cable entries for signals, 3 rows, 60 or 95 pcs.⁴⁾, 2 × M32 for power supply, 4 × M20 for bus cables⁵⁾

6

Icotek cable entry strip IP65, for up to 45 or 90 signals⁴⁾, 2 × M32 for power supply, 4 × M20 for bus cables⁶⁾

7

Cable entries/material

Cable entry in **plastic, black**

Ambient operating temperatures:

- Surface casing -20...+70 °C
- I/O device -20 ... +xx °C⁵⁾⁷⁾

0

Cable entry in **metal (nickel-plated brass)**

Ambient operating temperatures:

- Surface casing -40...+70 °C
- I/O device -30 ... +xx °C⁵⁾⁷⁾⁸⁾

1

Cable entry in **plastic, blue**

Ambient operating temperatures:

- Surface casing -20...+70 °C
- I/O device -20 ... +xx °C⁵⁾⁷⁾

2

Icotek cable entry in plastic, gray HN-24 frame

Ambient operating temperatures:

- Surface casing -40...+70 °C
- I/O device -40 ... +xx °C⁵⁾⁷⁾⁸⁾

3

Cable glands for use in mining

6

⁴⁾ Number of cable entries / signals depending on the enclosure dimensions

⁵⁾ Not for device group I M2

⁶⁾ Installing these components reduces the degree of protection for the enclosure to IP65

⁷⁾ The maximum temperature depends on the installed components.

⁸⁾ Only in conjunction with an installed heater.
This takes up 2 slots for ET 200iSP modules.
The heater (6DL9910-8AA) must be ordered separately.

⁹⁾ Only for device group I M2, number of signal lines depends on enclosure dimensions

Note:

Depending on the cables used, other types and sizes of cable entries can be fitted (on request).

Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

Technical specifications

Article number	6ES7154-3AB00-0AB0 ET200PRO, IM 154-3 PN HF	6ES7154-4AB10-0AB0 ET200PRO, IM 154-4 PN HF
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
Power loss		
Power loss, typ.	5 W	6 W; Dependent on terminal module, typ. maximum value for CU connection method, full load on RWB, for FO the value is approx. 0.7 W higher
Memory		
Micro Memory Card	No; Internal memory medium	No; Internal memory medium
Address area		
Addressing volume		
• Inputs	256 byte	256 byte
• Outputs	256 byte	256 byte
PROFINET IO		
• automatic detection of transmission rate	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Protocols (Ethernet)		
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules > IM 154-3 PN and IM 154-4 PN**Technical specifications (continued)**

Article number	6ES7154-3AB00-0AB0 ET200PRO, IM 154-3 PN HF	6ES7154-4AB10-0AB0 ET200PRO, IM 154-4 PN HF
Diagnostics indication LED		
• MAINT LED	Yes	Yes
• LINK LED	Yes	Yes
• RX/TX LED	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
• Load voltage monitoring 24 V DC (green)	Yes	Yes
Parameter		
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
Hot swapping of modules	possible	possible
Potential separation		
between backplane bus and electronics	No	No
between supply voltage and electronics	Yes	Yes
Isolation		
Isolation tested with	707 V DC (type test)	707 V DC (type test)
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP65	Yes	Yes
• IP66	Yes	Yes
• IP67	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	90 mm	135 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	490 g

Ordering data	Article No.		Article No.
IM 154-3 PN High Feature interface module For communication between ET 200pro and higher-level controllers over PROFINET IO; supports PROFI-safe. Terminal module 6ES7194-4AK00-0AA0 must be ordered separately.	6ES7154-3AB00-0AB0	7/8" sealing caps 1 pack = 10 units	6ES7194-3JA00-0AA0
IM 154-4 PN High Feature interface module For communication between ET 200pro and higher-level controllers over PROFINET IO; supports PROFI-safe. Terminal module 6ES7194-4A,00-0AA0 to be ordered separately.	6ES7154-4AB10-0AB0	7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailing type, pre-assembled with two 7/8" connectors, 5-pin, up to 50 m, in various lengths: 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m Other special lengths with 90° or 180° cable outlet.	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15 See http://support.automation.siemens.com/WW/view/en/26999294
Accessories		Power line	6XV1830-8AH10
Terminal modules for IM 154-3 PN High Feature • Terminal module CM IM PN M12, 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	5-wire, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	
Terminal modules for IM 154-4 PN High Feature • Terminal module CM IM PN M12, 7/8" for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8" • Terminal module CM IM PN 2xRJ45 for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector • Terminal module CM IM PN 2xSCRJ FO for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector	6ES7194-4AJ00-0AA0 6ES7194-4AF00-0AA0 6ES7194-4AG00-0AA0	7/8" cable connector For ET 200eco, with axial cable outlet. • With male insert, 5-pack • With female insert, 5-pack	6GK1905-0FA00 6GK1905-0FB00
M12 sealing cap	3RX9802-0AA00	Industrial Ethernet FastConnect installation cables • IE FC TP Standard Cable GP 2 x 2; Sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m. • IE FC TP Trailing Cable 2 x 2; Sold by the meter, max. order quantity 1000 m; minimum order quantity 20 m. • IE FC TP Trailing Cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE TP Torsion Cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE FC TP Marine Cable 2 x 2; Sold by the meter, max. order quantity 1000 m; minimum order quantity 20 m.	6XV1840-2AH10 6XV1840-3AH10 6XV1870-2D 6XV1870-2F 6XV1840-4AH10
IE M12 connecting cables Pre-assembled with two M12 connectors, up to 85 m, in various lengths: 0.3 m 0.5 m 1.0 m 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m Other special lengths with 90° or 180° cable outlet.	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 See http://support.automation.siemens.com/WW/view/en/26999294	IE RJ45 Plug PRO RJ45 plug connector in IP65/67-rated design for on-site assembly, plastic housing, 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 for POF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO and ET 200pro 1 pack = 1 unit	6GK1900-0MB00-6AA0

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules > IM 154-3 PN and IM 154-4 PN

Ordering data	Article No.		Article No.
IE SC RJ PCF Plug PRO SC RJ plug for PCF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO 1 pack = 1 unit.	6GK1900-0NB00-6AA0	General accessories	
Power Plug PRO 5-pole power plug for 2 x 24 V power supply in IP65/67-rated design, for on-site assembly, plastic housing, for SCALANCE X-200IRT and ET 200 pro 1 pack = 1 unit.	6GK1907-0AB10-6AA0	ET 200pro rack - Narrow, for interface, electronics and power modules 500 mm 1000 mm 2000 mm, can be cut to length - Compact, for interface, electronics and power modules 500 mm 1000 mm 2000 mm, can be cut to length - Wide, for interface, electronics, power modules and motor starters 500 mm 1000 mm 2000 mm, can be cut to length - Wide, for I/O modules and motor starters 500 mm 1000 mm 2000 mm	6ES7194-4GA00-0AA0 6ES7194-4GA60-0AA0 6ES7194-4GA20-0AA0 6ES7194-4GC70-0AA0 6ES7194-4GC60-0AA0 6ES7194-4GC20-0AA0 6ES7194-4GB00-0AA0 6ES7194-4GB60-0AA0 6ES7194-4GB20-0AA0 6ES7194-4GD00-0AA0 6ES7194-4GD10-0AA0 6ES7194-4GD20-0AA0
IE panel feed-through Control cabinet feed-through for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20) • 1 pack = 5 units	6GK1901-0DM20-2AA5	Spare fuse 12.5 A fast-blow, for interface and power modules, 10 units per pack	6ES7194-4HB00-0AA0
Push-pull cable connector For 1L+/ 2L+, non-assembled	6GK1907-0AB10-6AA0	SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC software, SIMATIC TDC	6ES7998-8XC01-8YE0
Cover caps for push-pull RJ45 female connectors 5 items per pack	6ES7194-4JD50-0AA0	SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates.	6ES7998-8XC01-8YE2
Cover caps for push-pull female connectors power (1L+, 2L+) 5 units	6ES7194-4JA50-0AA0		

Overview

The Power Output Modules (POMs) are an essential component of the SIPLUS HCS4200 heating control system. Up to 24 Power Output Modules can be operated on one Central Interface Module (CIM), split over 2 racks.

There are 5 Power Output Module versions:

- POM4220 Lowend
- POM4220 Midrange
- POM4220 Midrange Phase Control
- POM4220 Highend
- POM4220 Flexible

Technical specifications

Article number	6BK1942-2AA00-0AA0		6BK1942-2CA00-0AA0	6BK1942-2CA00-0AA1	6BK1942-2DA00-0AA0	6BK1942-2FA00-0AA0
	HCS POM4220 Lowend		HCS POM4220 Midrange	HCS POM4220 Midrange phase angle control	HCS POM4220 Highend	HCS POM4220 Flexible
General information						
Product brand name	SIPLUS					
Type of control of heat emitters	Half-wave control	Half-wave control and soft start	Half-wave control, phase control and soft start			Half-wave control
Installation type/mounting						
Mounting type	Screw mounting to rack					
Mounting position	vertical					
Type of ventilation	Self ventilation or forced ventilation					
Supply voltage						
Type of supply voltage	AC					
Rated value (AC)	230 V	277 V				
Relative negative tolerance	10 %	25 %				
Relative positive tolerance	10 %	8 %				
2nd rated value (AC)					480 V	110 V
Relative negative tolerance					25 %	10 %
Relative positive tolerance					8 %	50 %
3rd rated value (AC)						70 V
Relative negative tolerance						10 %
Relative positive tolerance						15 %
4th rated value (AC)						45 V
Relative negative tolerance						10 %
Relative positive tolerance						15 %
Line frequency						
• Rated value 1	50 Hz					
• Rated value 2	60 Hz					
• Relative symmetrical tolerance	5 %					
Mains buffering						
• Recovery time after power failure, typ.	1 s					
Resistance thermometer (RTD)						
• Design of electrical connection for supply voltage	Connector, 3-pole with spring-loaded connection	Connector, 3-pin				
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm²)	1x (0.75 ... 16 mm²)				
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm²)	1x (0.75 ... 16 mm²)				
- Connectable conductor cross-sections for AWG cables	1x (24 ... 8)	1x (18 ... 4)				
Power supply for the electronics						
Design of the power supply	Power supply via rack					
Power						
Active power input, max.	1 W					

I/O systems

IO systems for heating units
with integrated power outputs – modular design

SIPLUS HCS4200 heating control system > Power Output Module (POM)

Technical specifications (continued)

Article number	6BK1942-2AA00-0AA0	6BK1942-2CA00-0AA0	6BK1942-2CA00-0AA1	6BK1942-2DA00-0AA0	6BK1942-2FA00-0AA0
	HCS POM4220 Lowend	HCS POM4220 Midrange	HCS POM4220 Midrange phase angle control	HCS POM4220 Highend	HCS POM4220 Flexible
Power electronics					
Type of load	Ohmic load				
Power capacity, max.	16.1 kW	27.7 kW		48 kW	27.7 kW
• for delta connection with fan at 40 °C, max.				48 kW	
• for delta connection without fan at 40 °C, max.				15.6 kW	
• for star connection with fan at 40 °C, max.	16.1 kW	27.7 kW			
• for star connection without fan at 40 °C, max.	7.3 kW	9 kW			
Switching capacity current per phase, max.	35 A	50 A			
Short-time withstand current (SCCR) acc. to UL 508A	50 kA		100 kA		100 kA
Heating power					
• Number of digital outputs	16	12		8	12
• Number of heat emitters per output, max.	1			5	1
• Output voltage for heating power	230 V	277 V			
• 2nd output voltage for heating power				400 V	110 V
• 3rd output voltage for heating power					70 V
• 4th output voltage for heating power					45 V
• Power carrying capacity per output, min.	100 W			400 W	100 W
• Power carrying capacity per output, max.	1 449 W	3 324 W	4 432 W	9 600 W	4 432 W
- for heating elements with high inrush current, max.	750 W	1 600 W		2 760 W	1 600 W
• Output current for heating power	6.3 A	12 A	16 A	20 A	16 A
• Melting I2t value	57 A²·s	68 A²·s	20 A²·s	120 A²·s	20 A²·s
• Design of short-circuit protection per output	Safety fuse 6.3 A	Fuse 16 A		Melting fuse 25 A	Fuse 16 A
• Design of overvoltage protection	Transil Diode				
Integration and conversion time/resolution per channel					
• Design of electrical connection at output for heating and fan	Connector, 8-pin with tension spring connection	Connector, 6-pole with spring-loaded connection		Plug, 4-pole, with spring-loaded connection	Connector, 6-pole with spring-loaded connection
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm²)				
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm²)				
- Connectable conductor cross-sections for AWG cables, stranded	1x (24 ... 8)				
Interfaces					
Interfaces/bus type	system interface				
Interrupts/diagnostics/status information					
Number of status displays	19	15		11	15
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel				
Diagnostics function	Voltage diagnostics			Voltage and current diagnosis	Voltage diagnostics
Diagnostic messages					
• Wire-break	Yes				
• Fuse blown	Yes				
• Heat emitter defect	Yes				
• Parallel-connected heating elements	No			Yes	No

Technical specifications (continued)

Article number	6BK1942-2AA00-0AA0	6BK1942-2CA00-0AA0	6BK1942-2CA00-0AA1	6BK1942-2DA00-0AA0	6BK1942-2FA00-0AA0
	HCS POM4220 Lowend	HCS POM4220 Midrange	HCS POM4220 Midrange phase angle control	HCS POM4220 Highend	HCS POM4220 Flexible
Integrated Functions					
Monitoring functions					
• Temperature monitoring	Yes				
• Type of temperature monitoring	NTC thermistor				
Measuring functions					
• Voltage measurement	No			Yes	No
• Current measurement	No			Yes	No
Potential separation					
Design of electrical isolation between the outputs	Optocoupler and/or protective impedance between main circuit and PELV No				
Isolation					
Overvoltage category	III				
Degree of pollution	2				
EMC					
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011				
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge				
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)				
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV load lines				
Conducted interference due to surge acc. to IEC 61000-4-5	Supply and load lines: 1 kV symmetrical, 2 kV asymmetrical				
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)				
Degree and class of protection					
IP degree of protection	IP20				
Standards, approvals, certificates					
Device tag according to DIN EN 81346-2	Q				
Ambient conditions					
Ambient temperature during operation					
• min.	0 °C				
• max.	55 °C				
Ambient temperature during storage/transportation					
• Storage, min.	-25 °C				
• Storage, max.	70 °C				
• Transportation, min.	-25 °C				
• Transportation, max.	70 °C				
Air pressure acc. to IEC 60068-2-13					
• Operation, min.	860 hPa				
• Operation, max.	1 080 hPa				
• Storage, min.	660 hPa				
• Storage, max.	1 080 hPa				
Relative humidity					
• Operation at 25 °C, max.	95 %				
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C				

I/O systems

IO systems for heating units
with integrated power outputs – modular design

SIPLUS HCS4200 heating control system > Power Output Module (POM)

Technical specifications (continued)

Article number	6BK1942-2AA00-0AA0 HCS POM4220 Lowend	6BK1942-2CA00-0AA0 HCS POM4220 Midrange	6BK1942-2CA00-0AA1 HCS POM4220 Midrange phase angle control	6BK1942-2DA00-0AA0 HCS POM4220 Highend	6BK1942-2FA00-0AA0 HCS POM4220 Flexible
Vibrations					
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g				
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g				
Shock testing					
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis				
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis				
Dimensions					
Width	36 mm				
Height	285 mm				
Depth	281 mm				

Ordering data

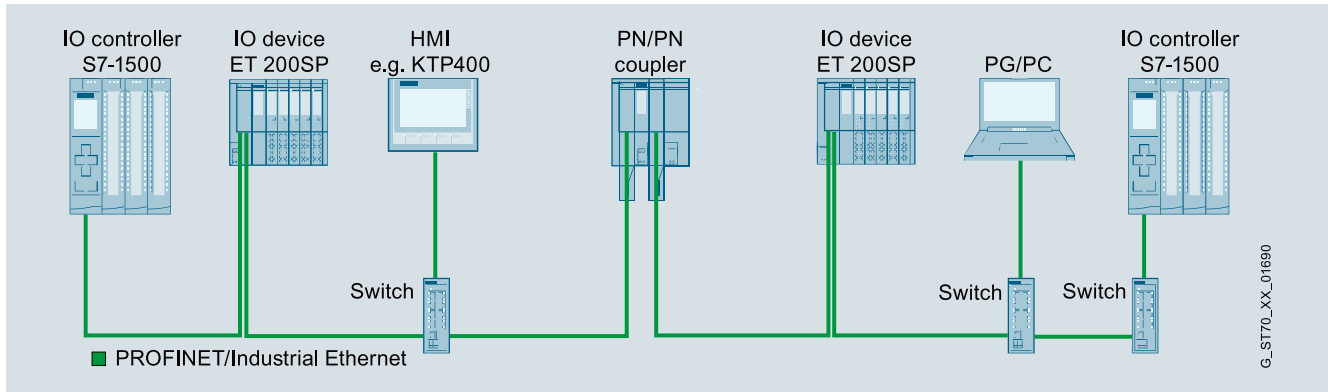
Article No.

Article No.

SIPLUS HCS4200 POM4220 Lowend Power Output Module with 16 outputs for connecting resistive loads	6BK1942-2AA00-0AA0	Accessories Spare fuse, 6.3 A/250 V, for the POM4220 Lowend Spare fuse, 16 A/500 V, for the POM4220 Midrange Spare fuse, 16 A/500 V, for the POM4220 Midrange SIPLUS HCS4200 connector set as accessory, comprising 10 connectors, 3-pin, for incoming supply, POM4220 Lowend SIPLUS HCS4200 connector set as accessory, comprising 5 connectors, 8-pin, for power outputs, POM4220 Lowend SIPLUS HCS4200 connector set as accessory, comprising 6 connectors, 3-pin, for incoming supply, POM4220 Midrange SIPLUS HCS4200 connector set as accessory, comprising 5 connectors, 6-pin, for power outputs, POM4220 Midrange SIPLUS HCS4200 connector set as accessory, comprising 5 connectors, 4-pin, for power outputs, POM4220 Highend	6BK1942-6AA00-0AA0 6BK1942-6BA00-0AA0 6BK1942-6HA00-0AA0 6BK1943-6AA00-0AA0 6BK1942-6CA00-0AA0 6BK1942-6GA00-0AA0 6BK1942-6EA00-0AA0 6BK1942-6LA00-0AA0
SIPLUS HCS4200 POM4220 Midrange Power Output Module with 12 outputs for connecting resistive loads	6BK1942-2CA00-0AA0		
SIPLUS HCS4200 POM4220 Midrange phase control Power Output Module with 12 outputs for connecting resistive loads	6BK1942-2CA00-0AA1		
SIPLUS HCS4200 POM4220 Highend Power Output Module with 8 outputs for connecting resistive loads	6BK1942-2DA00-0AA0		
SIPLUS HCS4200 POM4220 Flexible Power Output Module with 12 outputs for connecting resistive loads	6BK1942-2FA00-0AA0		

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, glass fiber). FO-to-copper media conversion can also be realized economically and without external converters.

Additional functions

- Quantity structures
 - Cyclic transmission: Up to 1 440 bytes each for input and output data
 - Data record transfer: Up to 4 096 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-CPU's 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 neighborhood 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
- Electrical isolation between the two PROFINET IO subnets
- 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

I/O systems

Network transitions

PN/PN couplers

Technical specifications

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
General information	
Product type designation	PN/PN coupler
Firmware version	V4.0
• FW update possible	Yes
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• PROFINET as of GSD version/GSD revision	V2.3
Installation type/mounting	
Mounting	Mounting rail 7.5 mm and 15 mm
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption, max.	360 mA; For 19.2 V input voltage at the right-hand supply terminal, including 2 plugged BA 2x LC
from supply voltage 1L+, max.	320 mA; For 19.2 V input voltage at the left-hand supply terminal, including 2 plugged BA 2x LC
Power loss	
Power loss, typ.	4 W; For 24 V input voltage and 2 plugged BA 2x RJ45 If BusAdapters with an optical interface are plugged, there is an additional 750 mW per optical interface (3 W with 2 plugged BA 2x LC)
Address area	
Address space per module	
• Address space per module, max.	254 byte; max. 254 bytes of input data and 253 bytes of output data
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; One PROFINET interface per line side
With optical interface	Yes; Via SIMATIC BusAdapter
PROFINET IO	
• automatic detection of transmission rate	Yes
• Transmission rate, max.	100 Mbit/s
• RJ45	Yes; Via SIMATIC BusAdapter
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

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Functionality	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
2. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
Functionality	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
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
Protocols (Ethernet)	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
PROFINET IO Device	
Services	
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- PROFIenergy	No
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4; per line side
Redundancy mode	
- MRP	Yes
- MRPD	Yes
- PROFINET system redundancy (S2)	No
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No; For operation on isochronous bus
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostic functions	Yes

Technical specifications (continued)

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
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 to network LINK (green)	Yes; 2x green link LEDs on BusAdapter
Potential separation	
between supply voltage and electronics	Yes; to power input 2
between Ethernet and electronics	Yes
Isolation	
Isolation tested with	707 V DC (type test)
Standards, approvals, certificates	
Network loading class	3
Security level	According to Security Level 1 Test Cases V1.1.4

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C; = Tmax for horizontal installation; for vertical installation Tmax = 50 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 2 000 m
Dimensions	
Width	100 mm; Minimized with good handling
Height	117 mm
Depth	74 mm; with mounting rail
Weights	
Weight, approx.	200 g; without BusAdapter

Ordering data

Article No.

PN/PN coupler	6ES7158-3AD10-0XA0
For deterministic data exchange between max. 4 PN controllers per side, also beyond network boundaries Transfer of PROFI-safe, I/O, MSI, MSO and data record communication, redundant power supply PN connection via SIMATIC BusAdapter (BA) Delivery without BusAdapter	
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
BusAdapter BA 2xRJ45	6ES7193-6AR00-0AA0
PROFINET BusAdapter with standard Ethernet socket	
BusAdapter BA 2xFC	6ES7193-6AF00-0AA0
PROFINET BusAdapter with FastConnect Ethernet connection; for increased vibration and EMC load capacity	
BusAdapter BA 2xSCRJ	6ES7193-6AP00-0AA0
PROFINET BusAdapter with fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	
BusAdapter BA SCRJ/RJ45	6ES7193-6AP20-0AA0
PROFINET BusAdapter; with media converter FO-Cu; 1 x SCRJ FO connection, 1 x RJ45 connection	
BusAdapter BA SCRJ/FC	6ES7193-6AP40-0AA0
PROFINET BusAdapter; with media converter FO-Cu; 1 x SCRJ FO connection, 1 x FastConnect connection for direct connection of the bus cable	

Article No.

BA 2XLC BusAdapter	6ES7193-6AG00-0AA0
PROFINET BusAdapter; 2 glass fiber-optic connections	
BA LC/RJ45 BusAdapter	6ES7193-6AG20-0AA0
PROFINET BusAdapter; with media converter glass FO-CU; 1 x LC connection, 1 x RJ45 connection	
BA LC/FC BusAdapter	6ES7193-6AG40-0AA0
PROFINET BusAdapter; with media converter glass FO-CU; 1 x LC connection, 1 x FastConnect connection for direct connection of the bus cable	
Reference identification label	6ES7193-6LF30-0AW0
10 sheets of 16 labels each	
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
Spare parts	
Cover for bus adapter interface	6ES7591-3AA00-0AA0
5 units	
Power supply connector	
For connecting the 24 V DC supply voltage	
• With push-in terminals	6ES7193-4JB00-0AA0
• With screw-type terminals	6ES7193-4JB50-0AA0

I/O systems

Network transitions

PN/BACnet LINK

Overview



- Gateway between PROFINET and BACnet/IP networks according to EN ISO16484-5 and Addendum ANSI/ASHRAE Standard 135-2012.
- Integrated in Totally Integrated Automation via HSP, TIA Portal V14 or higher
- Integrated PROFINET switch and RJ45 socket for BACnet
- 1 000 BACnet objects/object references
- 1 000 subscribe services
- BACnet features:
 - Client & Server
 - Device profile: B-GW
 - Change of value / cyclic and acyclic data exchange
 - Scan of BACnet/IP network
- Supported BACnet object types:
 - Device
 - Binary input
 - Binary output
 - Analog input
 - Analog output
- Supported BACnet services:
 - DS-COV-A/B
 - DM-DDB-A/B
 - DM-DOB-B
 - DS-RP-A/B
 - DS-WP-A/P
 - GW-EO-B
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported:
 - S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
General information	
Product type designation	PN/BACnet Link
Firmware version	
• FW update possible	Yes
Vendor identification (VendorID)	7
Product function	
• I&M data	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 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)	0.11 A
Current consumption, max.	0.13 A
Power loss	
Power loss, typ.	2.7 W

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
Interfaces	
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
BACnet	
• BACnet device profile	B-GW
• Supported character sets	ISO 10646 (UTF-8)
• Network Security	No
1. Interface	
Interface type	BACnet/IP
Physics	RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Functionality	
• PROFINET IO Device	Yes

Technical specifications (continued)

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostic functions	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	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
PNO certificate	Yes
BTL certificate	Yes
RoHS conformity	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
• Vertical installation, min.	-25 °C
• Vertical installation, max.	45 °C
• Horizontal installation, min.	-25 °C
• Horizontal installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Connection method	
Design of electrical connection	Screw connection
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	210 g

Ordering data
Article No.
SIMATIC PN/BACnet LINK

Network transition of PROFINET to BACnet/IP networks, device profile B-GW, IP20

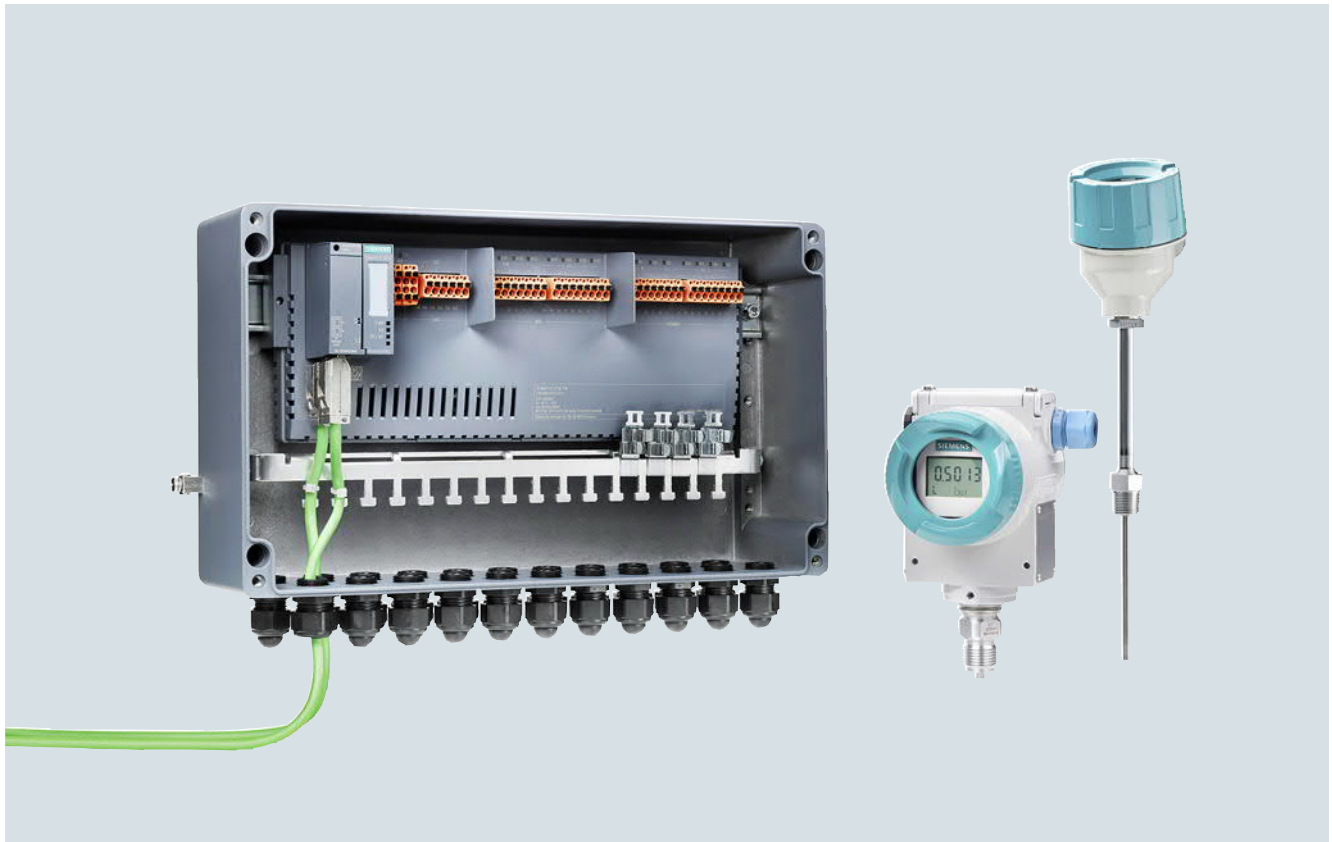
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I/O systems

Network transitions

SIMATIC CFU

Overview



9

The SIMATIC Compact Field Unit (SIMATIC CFU) is a smart field distributor for use as an I/O device on PROFINET of an automation system. SIMATIC CFU has the following interfaces:

- Fieldbus connections for PROFIBUS PA field devices
- Freely configurable channels (digital inputs/outputs for sensors or actuators)

The SIMATIC CFU is a real game changer in field device connection and offers entirely new prospects regarding simplicity and flexibility. This compact field distributor is installed at the process level and is connected via PROFINET directly to the controller to form the foundation for digitalization in the field. Utilization of digital fieldbus communication simplifies device interfacing considerably compared to conventional 4 to 20 mA engineering.

Plug-and-produce simplicity

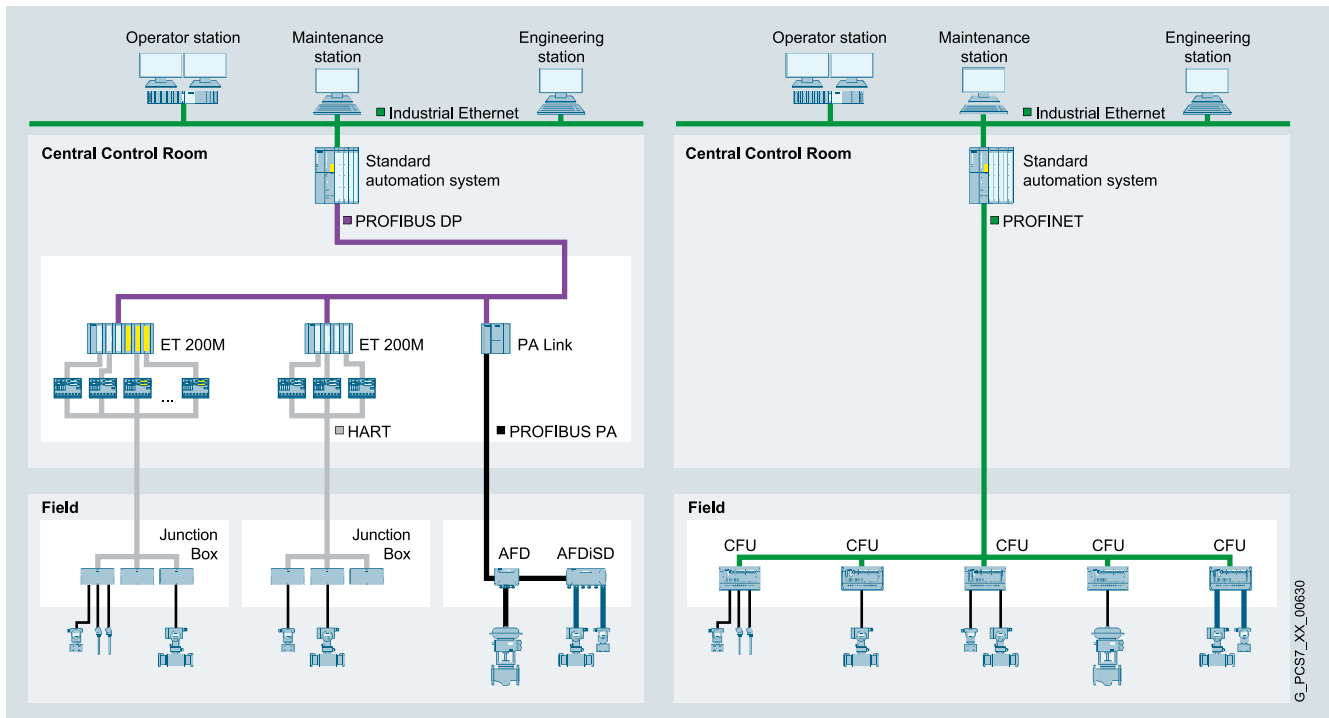
Digitalization requires a digital infrastructure facilitating integrated digital communication right down to the sensors and actuators. This can be built up using the tried and tested standard PROFIBUS PA, which has been incorporated into the PA Edition of the SIMATIC CFU, thus combining ruggedness and simplified handling with all the advantages of the PROFINET standard based on Industrial Ethernet. Connected devices are addressed automatically, and integration is simple 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 with software.

Greater flexibility thanks to consistent decentralization

Thanks to the distributed installation of the SIMATIC CFU, 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.

Overview (continued)

Field device connection with previous technology (left) and with SIMATIC CFU (right)

Most important functionsSystem interfacing over the Industrial Ethernet standard

- Redundant PROFINET connection (S2) for maximum availability
- Connection versatility with PROFINET BusAdapter (for example electrical, optical or mixed)

Combination of digital fieldbus and discrete I/Os

- 8 × digital fieldbus (PROFIBUS PA)
- 8 × digital inputs/outputs, freely configurable

Ready for distributed use

- For installation in hazardous areas up to zone 2-22
- Extended temperature range of -40 to +70 °C
- Conformal coating
- Can be used at altitudes of up to 4 000 meters
- Enhanced interference immunity in accordance with NAMUR recommendation NE21

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 with the use of standardized PA profiles and commissioning, device replacement and service wizards
- Implementation of diagnostic messages in accordance with NAMUR recommendation NE107
- 35-mm mounting onto standard rail

Configuring with SIMATIC PCS 7 and third-party systems

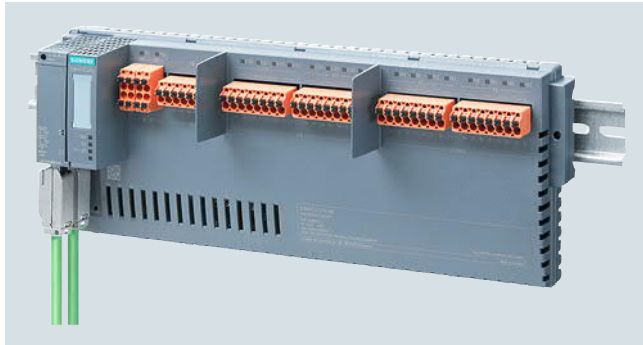
See information in the Siemens Industry Online Support

I/O systems

Network transitions
SIMATIC CFU

Basic device

Overview



SIMATIC CFU PA, in this case with BusAdapter and PROFINET bus cable

SIMATIC CFU PA

The SIMATIC CFU PA basic device has 16 digital interfaces:

- 8 fieldbus connections for PROFIBUS PA, each for 1 PROFIBUS PA field device
- 8 freely configurable digital inputs/outputs (DI/DQ), each for 1 sensor or actuator

PROFIBUS PA field devices are automatically addressed. SIMATIC CFU PA implements system-supported detection and integration of the PA field devices into the process control system using standardized PA profiles (issued by the PROFIBUS&PROFINET user association).

SIMATIC CFU PA also provides standardized detailed diagnostics (NE107) for preventive maintenance of PROFIBUS PA field devices.

In the event of physical faults (for example wire breaks or short circuits), defective connections are automatically disabled. The bus terminator is implemented automatically. Repairs and expansions to the individual connections are possible during runtime.



SIMATIC CFU aluminum field enclosure, open



SIMATIC CFU aluminum field enclosure, closed

Aluminum field enclosure

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure's scope of delivery:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has a window for LED diagnostics.

If FM approval is required, a separate version of the housing can be purchased (SIMATIC CFU FM aluminum field housing).

Note:

The SIMATIC CFU aluminum field housing and SIMATIC CFU FM aluminum field housing are currently not yet available for delivery!

Technical specifications

Article number	6ES7655-5PX11-0XX0 SIMATIC CFU PA
General information	
Product type designation	Compact Field Unit
HW functional status	E01
Firmware version	V1.0
• FW update possible	Yes
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	060DH
Number of channels	16
Product function	
• I&M data	Yes; I&M0 to I&M4
• The user can configure digital channels as input/output as required	Yes
• Digital channels can be parameterized	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	- / -
• STEP 7 configurable/integrated as of version	From STEP 7 V5.6 HF1 and higher
• PCS 7 configurable/integrated as of version	V9.0
• PROFIBUS as of GSD version/GSD revision	- / -
Installation type/mounting	
Mounting	on 35 mm DIN rail, 2 spacing units wide
Mounting position	Horizontal, vertical
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Redundant power supply	Yes
Mains buffering	
• Mains/voltage failure stored energy time	5 ms; Bridging for field devices and communication
Input current	
Current consumption (rated value)	2.5 A
Current consumption, max.	2.55 A
Inrush current, max.	8 A
I_{p1}	0.3 A ² ·s
Encoder supply	
Number of outputs	8
Output voltage encoder supply, min.	18.2 V
Short-circuit protection	Yes; Electronic
Output current	
• up to 60 °C, max.	2 A
• up to 70 °C, max.	1 A
Power loss	
Power loss, typ.	8.2 W; Depending on the type of BusAdapter used (typ. RJ45)
Address space per station	
• Address space per station, max.	1 440 byte; Dependent on configuration

Article number	6ES7655-5PX11-0XX0 SIMATIC CFU PA
Digital inputs	
Number of digital inputs	8
Source/sink 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	No
Number of simultaneously controllable inputs	
horizontal installation	
- up to 60 °C, max.	8; Total current must be observed, see DQ
- up to 70 °C, max.	8; Total current must be observed, see DQ
vertical installation	
- up to 60 °C, max.	8; Total current must be observed, see DQ
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.5 mA; Typical
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	No
- at "0" to "1", max.	3.2 ms
- at "1" to "0", max.	3.2 ms
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	8
Current-sinking	No
Current-sourcing	Yes
Short-circuit protection	Yes
• Response threshold, typ.	0.7 to 1.3 A
Limitation of inductive shutdown voltage to	Typ. L+ (-50 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	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	U _e minus 1 V
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA

I/O systems

Network transitions SIMATIC CFU

Basic device

Technical specifications (continued)

Article number	6ES7655-5PX11-0XX0 SIMATIC CFU PA
Output delay with resistive load	
• "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	No
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	2 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	0.5 A
horizontal installation	
- up to 70 °C, max.	1 A
vertical installation	
- up to 60 °C, max.	2 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interfaces	
Number of PROFINET interfaces	1
Number of PROFIBUS interfaces	0
PROFIBUS PA	
• Transmission rate, max.	31.25 kbit/s
• Number of connectable PA field devices	8; Electrically isolated from other interfaces, isolation tested at 2 500 V DC
• Current output to PA field devices, max.	320 mA
• permissible current per spur line	40 mA
• Automatic addressing	Yes
• System-supported integration of field devices via PA profiles	Yes
• Extended fieldbus diagnostics	Yes
1. Interface	
Interface type	PROFINET
Isolated	Yes
Interface types	
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes
Functionality	
• PROFINET IO Device	Yes
• PROFIBUS DP slave	No
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
• Autonegotiation	Yes
• Autocrossing	Yes

Article number	6ES7655-5PX11-0XX0 SIMATIC CFU PA
Protocols	
Supports protocol for PROFINET IO	Yes
Redundancy mode	
- MRP	Yes
- PROFINET system redundancy (S2)	Yes; Type S2
Open IE communication	
• LLDP	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostic functions	Yes
Diagnostic messages	
• Monitoring of encoder power supply	Yes
• Wire-break	Yes
• Short-circuit	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
• Digital input status indicator	Yes
• Digital output status indicator	Yes
• Spur line status/fault	Yes
Potential separation	
between the channels and PROFINET	Yes
Potential separation digital inputs	
• between the channels	No
• between the channels and the power supply of the electronics	No
Potential separation digital outputs	
• between the channels	No
• between the channels and the power supply of the electronics	No
Isolation	
Isolation tested with	1 500 V AC between PROFINET and electronics
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	70 °C
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C; Observe derating
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C; Observe derating
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %

Technical specifications (continued)

Article number	6ES7655-5PX11-0XX0
	SIMATIC CFU PA
Connection method	
Design of electrical connection	Connection plug
Spur line	
• Number of spur lines	8
• Type of cable	Type A
• Cable diameter, min.	6 mm
• Cable diameter, max.	12 mm
• Conductor cross-section, min.	0.2 mm ²
• Conductor cross-section, max.	2.5 mm ²
• Cable length, max.	120 m
• total current output to field devices, max.	320 mA
• Number of connectable field devices	8
• Current limitation per field device, max.	40 mA
• No-load voltage, max.	15.3 V
• short-circuit proof	Yes
• Short-circuit current (test current); max.	8 mA
• intrinsically safe according to FISCO model	Yes
• Debounce logic	Yes
Dimensions	
Width	300 mm; 329 mm
Height	115 mm; 123 mm
Depth	40 mm; 74 mm
Weights	
Weight, approx.	580 g

Ordering data
Article No.
SIMATIC CFU PA

SIMATIC Compact Field Unit PA Edition, with 16 I/O channels, PROFINET interface V2.3 (RT), use of PROFINET BusAdapter, media redundancy (MRP), PROFINET system redundancy (S2), configuration in run (CiR)

Process interfaces:

- 8 × PROFIBUS PA (with plug-and-produce)
- 8 × freely configurable DIQ

Installation up to Ex zone 2, temperature range -40 ... +70 °C, conformal coating, installation on 35 mm DIN rail

6ES7655-5PX11-0XX0
SIMATIC CFU aluminum field enclosure

Die-cast aluminum enclosure for SIMATIC CFU, enclosure for field installation
22 × M20 plastic cable glands (incl. blanking plugs), 35 mm DIN rail, rail for strain relief and shield support, display window for LED diagnostics, IP65 degree of protection

 Not yet available
6ES7655-5PX00-0AX0
SIMATIC CFU FM aluminum field housing

Die-cast aluminum housing for SIMATIC CFU, with FM approval, housing for field installation
22 × M20 plastic cable glands (incl. blanking plugs), 35 mm DIN rail, rail for strain relief and shield support, display window for LED diagnostics, IP65 degree of protection

 Not yet available
6ES7655-5PX00-0BX0
Note:

For use of the SIMATIC CFU PA, accessories are needed (connection technology). See section "Accessories".

I/O systems

Network transitions SIMATIC CFU

Bundles, accessories

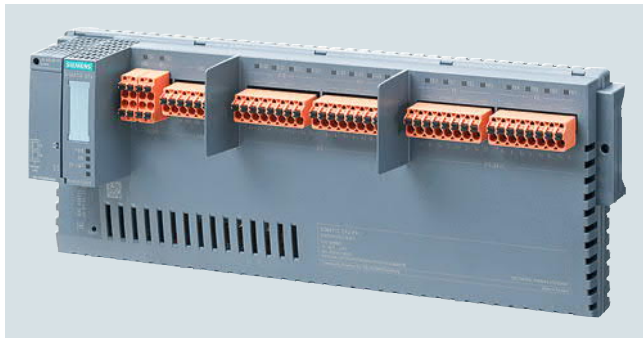
Overview bundles

For SIMATIC CFU PA, a pre-installed bundle is offered, with SIMATIC CFU PA basic device and SIMATIC CFU push-in terminals.

SIMATIC CFU PA bundle

Comprising:

- SIMATIC CFU PA, article no. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, article no. 6ES7655-5PX00-1XX0



SIMATIC CFU PA bundle

Ordering data

Article No.

SIMATIC CFU PA bundle

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

Overview accessories



BusAdapter BA 2xRJ45, 2xFC and 2xLC

BusAdapter

A BusAdapter as a separate component allows a free choice of SIMATIC CFU connection to PROFINET:

- BA 2xRJ45:
2 electrical connections for bus cable with standard RJ45 connector
- BA 2xFC:
2 electrical connections for direct connection of FastConnect bus cable
- BA 2xLC:
2 optical ports for fiber-optic cables

Technical specifications

Article number	6DL1193-6AR00-0AA0 ET 200SP HA, BUSADAPTER BA 2XRJ45	6DL1193-6AF00-0AA0 ET 200SP HA, BUSADAPTER BA 2XFC	6DL1193-6AG00-0AA0 ET 200SP HA, BUSADAPTER BA 2XLC
General information			
Product type designation	BA 2xRJ45	BA 2xFC	BA 2xLC
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1; 2 ports (switch) FC	1; 2 ports (switch) LC Multimode Glass Fibre
PROFINET IO			
• RJ45	Yes; 2x RJ45		
• FC (FastConnect)		Yes; 2 x	
• Number of LC ports			2

Technical specifications (continued)

Article number	6DL1193-6AR00-0AA0 ET 200SP HA, BUSADAPTER BA 2XRJ45	6DL1193-6AF00-0AA0 ET 200SP HA, BUSADAPTER BA 2XFC	6DL1193-6AG00-0AA0 ET 200SP HA, BUSADAPTER BA 2XLC
Cable length			
- Cu conductors	100 m	100 m	
- Multimode graded-index fiber 50/125 µm			3 km
- Multimode graded-index fiber 62.5/125 µm			3 km
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	65 °C; Redundant design (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontal, max. 50 °C vertical. When using different I/O devices, the derating specified there must be observed.
Dimensions			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm	59 mm
Weights			
Weight, approx.	46 g	53 g	60 g

Ordering data

Article No.	Article No.
BusAdapter	Connection technology
BusAdapter BA 2xRJ45 2 × RJ45 connections for PROFINET (standard Ethernet socket)	SIMATIC CFU screw-type terminals Complete set of screw-type terminals for SIMATIC CFU: two-tier 2x2 (24 V), single-tier 1x6 (GND) and single-tier 4x8 (IO)
BusAdapter BA 2xFC 2 × FastConnect (FC) connections for PROFINET	SIMATIC CFU push-in terminals Complete set of push-in terminals for SIMATIC CFU: two-tier 2x2 (24 V), single-tier 1x6 (GND) and single-tier 4x8 (IO)
BusAdapter BA 2xLC 2 × glass fiber-optic connections	
Shield terminals for aluminum field enclosure	
SIMATIC CFU shield terminals 4 shield terminals as an optional accessory for SIMATIC CFU aluminum field housing, for simple and secure shielding of up to 8 PROFIBUS PA field devices	
Not yet available 6ES7655-5PX00-0XX1	

I/O systems

Notes