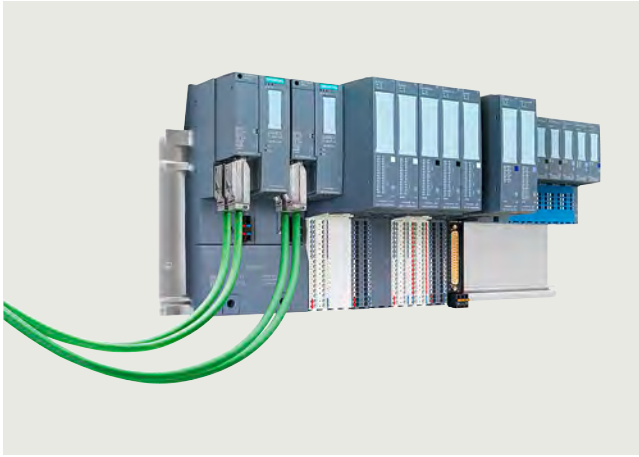


Overview

ET 200SP HA with redundant interface module, standard modules, Ex modules and D-SUB terminal block.

Compact design, flexible connection possibilities and high system availability with redundant PROFINET connections: the SIMATIC ET 200SP HA distributed I/O system is perfectly suited to the requirements of the process industry. The new design allows up to 56 I/O modules per station. An impressively high concentration of up to 32 channels on a module that is only 22.5 mm wide allows for maximum economy in the control cabinet.

Redundant PROFINET connections allow the connection of high-availability controllers via two independent networks, with a choice of copper or fiber-optic cables. The system can be scaled and extended in small steps using a variety of available modules, for example with digital and analog I/Os as well as NAMUR, HART, and other protocols. All 24 V standard signals are connected via an identical terminal block type, which allows a high degree of standardization for the control cabinets.

SIMATIC ET 200SP HA is designed for use in the control cabinet as well as for hazardous areas up to hazardous zone 2. The extended temperature range from -40 to +70 °C and the conformal coating of all components allow direct installation in the field.

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

Interface module

Overview



IM 155-6 PN HA

IM 155-6 PN HA interface module

The IM 155-6 PN HA together with the IM carrier module and the BusAdapter forms the interface of the ET 200SP HA. The interface is used for communication between the CPU and the connected ET 200SP HA I/O modules over PROFINET.

Ordering data

Article No.

Interface module	
PROFINET IM 155-6 PN interface module Max. 56 I/O modules, multi hot swap, no server module	6DL1155-6AU00-0PM0
Accessories	
IM cover Slot cover for interface module slots, to protect vacant slots Width 50 mm, 5 units	6DL1133-6CV50-0AM0

Technical specifications

Article number	6DL1155-6AU00-0PM0 ET 200SP HA, IM155-6 PN
General information	
Product type designation	IM 155-6 PN
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V16
• STEP 7 configurable/ integrated from version	V5.6
• PCS 7 configurable/ integrated from version	V9.0
• PCS neo can be configured/ integrated from version	V3.0
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Address area	
Address space per station	
• Address space per station, max.	1 440 byte; 1 440 bytes R1 and S1 without CiR, otherwise 1 000 bytes
Hardware configuration	
Integrated power supply	Yes; 24 V DC
Rack	
• Modules per rack, max.	56; 56 slots for I/O modules + server module (width without IM ≤ 1.3 m)
Time stamping	
Accuracy	1 ms; In compliance with the supplementary conditions described in the Equipment Manual
Interfaces	
Number of PROFINET interfaces	1; 2 ports (switch)
1. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapters: BA 2x RJ45, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA VD
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; as MRP client

Article number	6DL1155-6AU00-0PM0 ET 200SP HA, IM155-6 PN
Interface types	
RJ 45 (Ethernet)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Redundancy mode	
• PROFINET system redundancy (S2)	Yes; S2, R1
Media redundancy	
- MRP	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• ACT LED	Yes; green LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Dimensions	
Width	50 mm
Height	138 mm
Depth	89 mm
Weights	
Weight, approx.	192 g; without BusAdapter

I/O systems

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

Digital I/O modules

Overview



- DI 16×24VDC HA digital input module
16 24 V DC digital inputs
- DI 32×24VDC HA digital input module
32 24 V DC digital inputs
- DI 16×NAMUR HA digital input module
16 NAMUR digital inputs
- DI 8×24...125VDC HA digital input module
8 24 ... 125 V DC digital inputs
- DI 8×230VAC HA digital input module
8 230 V AC digital inputs
- DQ 16×24VDC/0.5A HA digital output module
16 24 V DC digital outputs, 0.5 A
- DQ 32×24VDC/0.5A HA digital output module
32 24 V DC digital outputs, 0.5 A
- RQ 4×120VDC-230VAC/5A CO HA digital output module
4 24 ... 120 V DC, 24 ... 230 V AC relay outputs, 5 A

Ordering data

Article No.

DI 16×24VDC HA digital input module
16 24 V DC digital inputs, color code CC01, for terminal block type H1 and M1, channel diagnostics

6DL1131-6BH00-0PH1

DI 32×24VDC HA digital input module
32 24 V DC digital inputs, color code CC00, for terminal block type P0 and H1, channel diagnostics

6DL1131-6BL00-0PH1

DI 16×NAMUR HA digital input module
16 NAMUR digital inputs, color code CC01, for terminal block type H1 and M1, channel diagnostics

6DL1131-6TH00-0PH1

DI 8×24...125VDC HA digital input module
8 24 ... 125 V DC digital inputs, color code CC42, for terminal block type K0, channel diagnostics

6DL1131-6DF00-0PK0

DI 8×230VAC HA digital input module
8 230 V AC digital inputs, color code CC42, for terminal block type K0, module diagnostics

6DL1131-6GF00-0PK0

DQ 16×24VDC/0.5A HA digital output module
16 24 V DC digital outputs, 0.5 A, color code CC02, for terminal block type H1 and M1, channel diagnostics

6DL1132-6BH00-0PH1

DQ 32×24VDC/0.5A HA digital output module
32 24 V DC digital outputs, 0.5 A, color code CC00, for terminal block type N0 and H1, channel diagnostics

6DL1132-6BL00-0PH1

RQ 4×120VDC-230VAC/5A CO HA digital output module
4 24 ... 120 V DC, 24 ... 230 V AC relay outputs, 5 A, color code CC40, for terminal block type K0, module diagnostics

6DL1132-6HD50-0PK0

Article No.

Accessories

Labeling strips

For labeling the I/O modules

- Roll, light gray (with a total of 500 labeling strips), 1 unit
- DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)
- DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)

6DL1193-6LR00-0AA0

6DL1193-6LA00-0AA0

6DL1193-6LA00-0AG0

Color-coded labels

For push-in terminals

- Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)
- Color code CC02, 10 units gray (terminals 1 to 16), blue (terminals 17 to 32)
- Color code CC40, 10 units gray (terminals 1 to 16)
- Color code CC42, 10 units gray (terminals 1 to 8), blue (terminals 9 to 16)

6DL1193-6CP01-2HH1

6DL1193-6CP02-2HH1

6DL1193-6CP40-2HK0

6DL1193-6CP42-2HK0

Equipment labeling plates

10 sheets with 16 labels each

6ES7193-6LF30-0AW0

TM cover

Slot cover for I/O modules, to protect vacant I/O slots
Width 22.5 mm, 5 units

6DL1133-6CV22-0AM0

Technical specifications

Article number	6DL1131-6GF00-0PK0 ET 200SP HA, DI 8x230VAC	6DL1131-6BH00-0PH1 ET 200SP HA, DI 16x24VDC	6DL1131-6BL00-0PH1 ET 200SP HA, DI 32x24VDC	6DL1131-6DF00-0PK0 ET 200SP HA, DI 8x24 ... 125VDC	6DL1131-6TH00-0PH1 ET 200SP HA, DI 16xNAMUR
General information					
Product type designation	DI 8x230VAC HA	DI 16x24VDC HA	DI 32x24VDC HA	DI 8x24 ... 125 V DC HA	DI 16xNAMUR HA
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version	V16	V16	V16	V16	V16
• STEP 7 configurable/ integrated from version	V5.6	V5.6	V5.6	V5.6	V5.6
• PCS 7 configurable/ integrated from version	V9.0	V9.0	V9.0	V9.0	V9.0
• PCS neo can be configured/ integrated from version	V3.0	V3.0	V3.0	V3.0	V3.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter		No	No	No	No
• Oversampling		No	No	No	
• MSI		No	No	No	
Supply voltage					
Rated value (DC)		24 V	24 V	24 V	24 V
Rated value (AC)	230 V				
Reverse polarity protection		Yes	Yes	Yes	Yes
Encoder supply					
Number of outputs		16	32; When terminal block with encoder supply is used (type P0)		16
Short-circuit protection		Yes; electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low- resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable	Yes; When using TB type P0		Yes
Output current					
• up to 60 °C, max.		2 A; 1 A when mounted vertically; see derating information in Equipment Manual			
• up to 70 °C, max.		1 A; See derating information in Equipment Manual			

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Digital I/O modules

Technical specifications

Article number	6DL1131-6GF00-0PK0	6DL1131-6BH00-0PH1	6DL1131-6BL00-0PH1	6DL1131-6DF00-0PK0	6DL1131-6TH00-0PH1
	ET 200SP HA, DI 8X230VAC	ET 200SP HA, DI 16X24VDC	ET 200SP HA, DI 32X24VDC	ET 200SP HA, DI 8X24 ... 125VDC	ET 200SP HA, DI 16XNAMUR
24 V encoder supply					
• 24 V • Short-circuit protection		Yes Yes; electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low- resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable 0.5 A 2 A			
• Output current per channel, max. • Output current per module, max.					
Digital inputs					
Number of digital inputs	8; Isolated	16	32	8	16; NAMUR
Digital inputs, parameterizable		Yes	Yes		Yes
Source/sink input		Yes; P-reading	Yes; P-reading	Yes; P-reading	
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	Yes	
Input characteristic curve in accordance with IEC 61131, type 2		No	No		
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	Yes	
Pulse extension		Yes	No		Yes; 0.5 s, 1 s, 2 s
• Length		off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Time stamping		Yes; Resolution 10 ms		Yes; Resolution 10 ms	Yes
Time stamp (with precision of 1 ms)		Yes; Resolution 1ms		Yes; Resolution 1ms	No
Edge evaluation		Yes; rising edge, falling edge, edge change	Yes; rising edge, falling edge, edge change		Yes; rising edge, falling edge, edge change
Signal change flutter					Yes; 2 to 32 signal changes
Flutter observation window					Yes; 0.5 s, 1 s to 100 s in 1-s steps
Input voltage					
• Rated value (DC)		24 V	24 V		8.2 V
• Rated value (AC)	230 V				
• for signal "0"	0V AC to 40V AC	-30 to +5 V	-30 to +5 V	-125 ... +5 V	
• for signal "1"	74 V AC to 264 V AC	+11 to +30V	+11 to +30V	+11 ... +125 V	
Input current					
• for signal "1", typ.	10.8 mA	2.5 mA	2.5 mA	3.1 mA	
for 10 k switched contact					
- for signal "0"					0.35 to 1.2 mA
- for signal "1"					2.1 ... 6.4 mA
for unswitched contact					
- for signal "0", max. (permissible quiescent current)					0.5 mA
- for signal "1"					typ. 8 mA
for NAMUR encoders					
- for signal "0", min.					0.35 mA
- for signal "0", max.					1.2 mA
- for signal "1", min.					2.1 mA
- for signal "1", max.					6.4 mA

Technical specifications

Article number	6DL1131-6GF00-0PK0 ET 200SP HA, DI 8X230VAC	6DL1131-6BH00-0PH1 ET 200SP HA, DI 16X24VDC	6DL1131-6BL00-0PH1 ET 200SP HA, DI 32X24VDC	6DL1131-6DF00-0PK0 ET 200SP HA, DI 8X24 ... 125VDC	6DL1131-6TH00-0PH1 ET 200SP HA, DI 16XNAMUR
Input delay (for rated value of input voltage)					
tolerated changeover time for changeover contacts					300 ms
for standard inputs					
- parameterizable		Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms		Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	
for NAMUR inputs					
- at "0" to "1", max.					17 ms
- at "1" to "0", max.					25 ms
Encoder					
Connectable encoders					
- NAMUR encoder/changeover contact according to EN 60947 - Single contact / changeover contact unconnected - Single contact / changeover contact connected with 10 kΩ 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA	Yes Yes Yes Yes; Acc. to NAMUR 1.2 mA
Interrupts/diagnostics/ status information					
Diagnostics function		Yes	Yes		
Alarms					
- Diagnostic alarm - Hardware interrupt	Yes	Yes; channel by channel Yes; channel by channel	Yes; channel by channel Yes; channel by channel	Yes Yes; Parameterizable, channels 0 to 7, rising/falling edge	Yes; channel by channel Yes; Parameterizable, channels 0 to 15, rising/falling edge
Diagnostics					
- Diagnostic information readable - Monitoring the supply voltage - parameterizable - Monitoring of encoder power supply - Wire-break - Short-circuit - Short-circuit to M - Group error - Changeover contact error	Yes	Yes Yes; Module-wise Yes Yes Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kΩ to 18 kΩ Yes; Encoder supply to M, channel by channel	Yes Yes; Module-wise Yes Yes Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kΩ to 18 kΩ No	Yes Yes Yes Yes; channel by channel Yes	Yes Yes Yes Yes Yes Yes Yes Yes
Diagnostics indication LED					
- MAINT LED - Monitoring of the supply voltage (PWR-LED) - Channel status display - for channel diagnostics - for module diagnostics	Yes; Yellow LED Yes; green LED Yes; green/red DIAG LED	Yes; Yellow LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red LED	Yes; Yellow LED Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED	Yes; Yellow LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED	Yes; Yellow LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Digital I/O modules

Technical specifications

Article number	6DL1131-6GF00-0PK0 ET 200SP HA, DI 8X230VAC	6DL1131-6BH00-0PH1 ET 200SP HA, DI 16X24VDC	6DL1131-6BL00-0PH1 ET 200SP HA, DI 32X24VDC	6DL1131-6DF00-0PK0 ET 200SP HA, DI 8X24 ... 125VDC	6DL1131-6TH00-0PH1 ET 200SP HA, DI 16XNAMUR
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
Dimensions					
Width	22.5 mm	22.5 mm	22.5 mm	22.5 mm	22.5 mm
Height	115 mm	115 mm	115 mm	115 mm	115 mm
Depth	138 mm	138 mm	138 mm	138 mm	138 mm
Weights					
Weight, approx.	148 g	135 g	150 g	165 g	153 g

Overview



- Analog input module AI 16xI 2-wire HART HA
16 analog inputs
Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA, 4 to 20 mA with HART
- Analog input module AI 16xTC/8xRTD 2-/3-/4-wire HA
16 analog inputs for thermocouples; alternatively 8 analog inputs for thermistors
- Analog input module AI 16xI 2-wire HA
16 analog inputs
Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA
- Analog input module AI 16xI 2-wire HA
8 analog inputs for voltage measurements, current measurements, thermocouples, alternatively 4 analog inputs for thermistors
- AQ 8xI HART HA analog output module
8 analog outputs
Power output in the output ranges 0 to 10 mA, 0 to 20 mA, 4 to 20 mA and 4 to 20 mA HART
- Analog input module AI 4XI 2-/4-wire HART ISOL
4 galvanically isolated analog inputs (2-/4-wire)
- Analog output module AQ 4XI HART ISOL
4 galvanically isolated analog outputs (2-wire)

Ordering data

Article No.

Article No.

AI 16xI 2-wire HART HA analog input module

16 analog inputs

Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA, 4 to 20 mA with HART

Color code CC01, for terminal block type H1 and M1, channel diagnostics, 16-bit

6DL1134-6TH00-0PH1

AI 16xTC/8xRTD 2-/3-/4-wire HA analog input module

16 analog inputs for thermocouples, alternatively 8 analog inputs for thermistors

Color code CC00, for terminal block type H1 and M1, channel diagnostics, 16-bit

6DL1134-6JH00-0PH1

AQ 8xI HART HA analog output module

8 analog outputs

Power output in the output ranges 0 to 10 mA, 0 to 20 mA, 4 to 20 mA and 4 to 20 mA HART

Color code CC00, for terminal block type H1 and M1, channel diagnostics, 16-bit

6DL1135-6TF00-0PH1

AI 4XI 2-/4-wire HART ISOL analog input module

14 analog inputs

Color code CC01, for terminal block type K0, L0, channel diagnostics, 16-bit, +/-0.1%

6DL1134-6UD00-0PK0

AQ 4XI HART ISOL analog output module

4 analog outputs

Color code CC00, for terminal block type K0, L0, channel diagnostics, 16-bit, +/-0.1%

6DL1135-6UD00-0PK0

Accessories**Labeling strips**

For labeling the I/O modules

- Roll, light gray (with a total of 500 labeling strips), 1 unit
- DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)
- DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)

6DL1193-6LR00-0AA0

6DL1193-6LA00-0AA0

6DL1193-6LA00-0AG0

Color-coded labels

For push-in terminals

- Color code CC00, 10 units gray (terminals 1 to 32)
- Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)

6DL1193-6CP00-2HH1

6DL1193-6CP01-2HH1

Equipment labeling plates

10 sheets with 16 labels each

6ES7193-6LF30-0AW0

TM cover

Slot cover for I/O modules, to protect vacant I/O slots

Width 22.5 mm, 5 units

6DL1133-6CV22-0AM0

I/O systems

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

Analog I/O modules

Technical specifications

Article number	6DL1134-6UD00-0PK0 ET 200SP HA, AI 4xI 2-/4-Wire HART ISOL
General information	
Product type designation	AI 4xI 2-/4-wire HART ISOL HA
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17
• STEP 7 configurable/ integrated from version	V5.6
• PCS 7 configurable/ integrated from version	V9.1
• PCS neo can be configured/ integrated from version	V3.0
• SPPA-T3000 can be configured/ integrated from version	V8.2 SP4
• PROFINET from GSD version/ GSD revision	GSDML V2.3.5
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4
Short-circuit protection	Yes; Electronic
Analog inputs	
Number of analog inputs	4
• For current measurement	4
permissible input current for current input (destruction limit), max.	24 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 16 bit incl. sign
Cable length	
• shielded, max.	800 m; with unshielded cables up to 800 m, remember that (external) EMC loads can cause incorrect measured values
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; 14 bit at 60 Hz (0 ... 10 mA), 16 bit at 10 Hz, 15 bit at 50 Hz and 15 bit at 60 Hz interference suppression
Smoothing of measured values	
• parameterizable	Yes; none, weak, medium, strong, channel-by-channel
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %

Article number	6DL1134-6UD00-0PK0 ET 200SP HA, AI 4xI 2-/4-Wire HART ISOL
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply
• Overflow/underflow	Yes; channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes; 125 V AC / 150 V DC (when using terminal blocks with push-in terminals); SELV/PELV (when using terminal blocks with D-SUB)
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C; Observe derating
• vertical installation, min.	-40 °C
• vertical installation, max.	70 °C; Observe derating
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	163 g

Technical specifications

Article number	6DL1135-6UD00-0PK0 ET 200SP HA, AQ 4XI HART ISOL
General information	
Product type designation	AQ 4XI HART ISOL HA
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V17
• STEP 7 configurable/ integrated from version	V5.6
• PCS 7 configurable/ integrated from version	V9.1
• PCS neo can be configured/ integrated from version	V3.0
• SPPA-T3000 can be configured/ integrated from version	V8.2 SP4
• PROFINET from GSD version/ GSD revision	GSDML V2.3.5
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog outputs	
Number of analog outputs	4
Output ranges, current	
• 0 to 20 mA	Yes; 15 bit
• 4 mA to 20 mA	Yes; 15 bit
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Cable length	
• shielded, max.	1 000 m; with unshielded cables up to 800 m, remember that (external) EMC loads can cause incorrect measured values
Analog value generation for the outputs	
Settling time	
• for resistive load	1.2 ms; 750 ohm
• for inductive load	1.2 ms
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.1 %

Article number	6DL1135-6UD00-0PK0 ET 200SP HA, AQ 4XI HART ISOL
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes
• Overflow/underflow	Yes; channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes; 125 V AC / 150 V DC (when using terminal blocks with push-in terminals); SELV/PELV (when using terminal blocks with D-SUB)
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C; Observe derating
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C; Observe derating
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	165 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Analog/digital module

Overview



The I/O module AI-DI 16/DQ16x24VDC HART HA is available in the following versions:

- DI 16/DQ16x24VDC HA in digital-only mode
- AI-DI 16/DQ 16x24VDC HART HA as digital/analog module in mixed mode

Time stamping is available with configuration in mixed mode. High-precision time stamping (SoE: Sequence of Events) with a precision of 1 ms is available with configuration in digital-only mode.

In mixed mode, the 16 inputs can also be set channel by channel as either digital inputs or analog inputs with or without HART. HART is only available in mixed mode and with configuration in a measuring range of 4 to 20 mA.

Ordering data

Article No.

AI-DI 16/DQ16x24VDC HART HA input/output module

16 channels, each with digital output and digital/analog input

Color code CC01, for terminal block type H1 and M1

6DL1133-6EW00-0PH1

Accessories

Labeling strips

For labeling the I/O modules

- Roll, light gray (with a total of 500 labeling strips), 1 unit
- DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)
- DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)

6DL1193-6LR00-0AA0

6DL1193-6LA00-0AA0

6DL1193-6LA00-0AG0

Color-coded labels

For push-in terminals

- Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)

6DL1193-6CP01-2HH1

Equipment labeling plates

10 sheets with 16 labels each

6ES7193-6LF30-0AW0

Slot cover for I/O modules

22.5 mm wide

6DL1133-6CV22-0AM0

Technical specifications

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
General information	
Product type designation	AI-DI 16/DQ 16x24VDC HART HA
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V16
• STEP 7 configurable/ integrated from version	V5.6
• PCS 7 configurable/ integrated from version	V9.0
• PCS neo can be configured/ integrated from version	V3.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3
Operating mode	
• DI	Yes
• Counter	Yes
• DQ	Yes
• DQ with energy-saving function	No
• PWM	No
• Oversampling	No
• MSI	No
• MSO	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	16
Short-circuit protection	Yes; per channel, electronic
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
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	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Time stamping	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	Yes; Resolution 1ms
Digital input functions, parameterizable	
• Gate start/stop	Yes; Partner channel of n+8 counter
• Freely usable digital input	Yes; Parameterizable input filter
• Counter	Yes; Incl. frequency measurement
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
Digital outputs	
Number of digital outputs	16
Current-sinking	No
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; Response threshold 0.7 A to 1.3 A
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.7 mA
Output delay with resistive load	
• "0" to "1", typ.	50 µs
• "1" to "0", typ.	100 µs
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	0.5 A
• Current per module, max.	2 A
Analog inputs	
Number of analog inputs	16
permissible input current for current input (destruction limit), max.	30 mA
Input ranges	
• Current	Yes; 0 ... 10 mA, 0 ... 20 mA, 4 ... 20 mA, 4 ... 20 mA HART
Input ranges (rated values), currents	
• 0 to 10 mA	Yes
• 0 to 20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 16 bit incl. sign
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; Resolution with overrange (bit including sign), max. 16 bits, exception: 15 bits at 60 Hz interference suppression and 0 to 10 mA
• Integration time, parameterizable	Yes; channel by channel
Smoothing of measured values	
• parameterizable	Yes; none, weak, medium, strong, channel-by-channel

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Analog/digital module**Technical specifications**

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
• Hardware interrupt	Yes; Parameterizable, channels 0 to 15, rising/falling edge
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel by channel
• Short-circuit to M	Yes; Encoder supply to M, channel by channel
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	No
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
Integrated Functions	
Frequency measurement	Yes
• Number of frequency meters	8
Counting functions	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes; Via partner channel (digital input n+8)
• Software gate	Yes
Measuring functions	
• Dynamic measurement period adjustment	Yes
Measuring range	
- Frequency measurement, min.	0.1 Hz
- Frequency measurement, max.	5 kHz
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C; Observe derating
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C; Observe derating
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	150 g

Overview

ET 200SP HA Fast Multi IO & Counter

- Analog/digital module, input/output, counter, speed measurement
- 8 analog outputs (up to 800 Hz)
Measuring range: 4x 0/4-20 mA, ± 20 mA, ± 50 mA and 4x ± 10 V
- 4 analog inputs
Measuring ranges: 0/4-20 mA, ± 20 mA, ± 30 mA, ± 10 V, 0-20 V, -20-0 V
- Sensor supply: ± 50 mA via digital output
- 4 digital inputs 24 V
- 3 counters up to 70 kHz
Counter functions: up/down, once/periodic, gate control, 32-bit
- 6 combined digital inputs and outputs (DI/DQ)

ET 200SP HA vibration protection

- Analog/digital module, input/output, vibration protection
- Vibration protection for rotating machinery (e.g. drives, compressors, gears, fans)
- 4 analog inputs (up to 50 kHz signal frequency)
Measuring ranges: 0/4-20 mA, ± 20 mA, ± 30 mA, ± 10 V, 0-20 V, -20-0 V
Suitable for electrodynamic and piezoelectric vibration sensors
- Sensor supply: ± 50 mA
- Integrated signal processing:
10 configurable function sequences for calculation of vibration-specific performance characteristics (simultaneous use 8 function sequences per module)
- 4 analog inputs
Measuring ranges: 0/4-20 mA, ± 20 mA, ± 30 mA, ± 10 V, 0-20 V, -20-0 V
- 8 analog outputs (up to 800 Hz)
Measuring range: 4x 0/4-20 mA, ± 20 mA, ± 50 mA and 4x ± 10 V
- Sensor supply: ± 50 mA via digital output
- 4 digital inputs 24 V
- 6 combined digital inputs and outputs (DI/DQ)

Ordering data**Article No.**

**ET 200SP HA
TM Fast Multi IO & Counter**
4xAI, 8xAQ, 4xDI, 6xDI/DQ
Color code CC00,
terminal block type H1 and M1

6DL1138-6EA00-0EH1

**ET 200SP HA
vibration protection**
4xAI, 8xAQ, 4xDI, 6xDI/DQ
Color code CC00,
terminal block type H1 and M1

6DL1138-6EC00-0EH1

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Technology modules

Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA vibration protection
General information		
Product type designation	Fast Multi IO & Counter	Vibration protection module 4 channels
Product function		
• Isochronous mode	No	No
Engineering with		
• SPPA-T3000 can be configured/ integrated from version	V8.2 SP2	V8.2 SP2
Operating mode		
• DI	Yes	Yes
• Counter	Yes	
• DQ	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Encoder supply		
Number of outputs	6; max. depending on parameterization	6; max. depending on parameterization
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Digital inputs		
Number of digital inputs	10; Of these, 6 combined DI/DQ	10; Of these, 6 combined DI/DQ
Digital inputs, parameterizable	Yes	Yes
Source/sink input	Yes; DI0 ... DI3 (param.); sinking DIDQ4 ... DIDQ9	Yes; DI0 ... DI3 (param.); sinking DIDQ4 ... DIDQ9
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Pulse extension	Yes	Yes
• Length	2 s; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	2 s; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Digital input functions, parameterizable		
• Gate start/stop	Yes; Selectable: Standard DI, encoder signals A, B, N, gate start, gate stop, set counter	
• Freely usable digital input	Yes	
• Counter	Yes	
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	0 ... 5 V	0 ... 5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.6 mA; 2.6 mA DI, 3.5 mA DIDQ	2.6 mA; 2.6 mA DI, 3.5 mA DIDQ
Input delay (for rated value of input voltage) for standard inputs		
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
for technological functions		
- parameterizable	Yes; Adjustable filter: 5 µs, 25 µs	
Digital outputs		
Number of digital outputs	6; max. depending on parameterization	6; max. depending on parameterization
Current-sinking	No	No
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes	Yes
Overload protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)	L+ -(37 to 41V)
Controlling a digital input	Yes	Yes

Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA vibration protection
Digital output functions, parameterizable		
• Switching tripped by comparison values	Yes; As output signal of a high-speed counter	
• Freely usable digital output	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A
Load resistance range		
• lower limit	48 Ω	48 Ω
Output voltage		
• for signal "1", min.	18.1 V	18.1 V
Output current		
• for signal "1" rated value	0.5 A	0.5 A
Output delay with resistive load		
• "0" to "1", typ.	1 ms	1 ms
• "1" to "0", typ.	100 µs	100 µs
Parallel switching of two outputs		
• for logic links	No	
• for uprating	No	
• for redundant control of a load	Yes	
Switching frequency		
• with resistive load, max.	800 Hz	800 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A	0.5 A
• Current per module, max.	2 A	2 A
Analog inputs		
Number of analog inputs	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V
permissible input current for current input (destruction limit), max.	50 mA; Protection available against destruction	50 mA; Protection available against destruction
Cycle time (all channels), min.		1.25 ms; For up to 128 samples per channel
Input ranges		
• Voltage	Yes; 0 ... 10 V, -10 ... 10 V, 0 ... 20 V, -20 ... 0 V	Yes; 0 ... 10 V, -10 ... 10 V, 0 ... 20 V, -20 ... 0 V
• Current	Yes; 0 ... 20 mA, 4 ... 20 mA, -20 ... 20 mA, -30 ... 30 mA, -20 ... 0 mA	Yes; 0 ... 20 mA, 4 ... 20 mA, -20 ... 20 mA, -30 ... 30 mA, -20 ... 0 mA
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -10 V to +10 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA	Yes; 0 mA or 4 mA to 20 mA
• -20 mA to +20 mA	Yes	Yes
• 4 mA to 20 mA	Yes; and 0 to 20 mA	Yes; and 0 to 20 mA
Cable length		
• shielded, max.	600 m	600 m
Analog outputs		
Number of analog outputs	8; 4 AQ-I, 4 AQ-U	8; 4 AQ-I, 4 AQ-U
Cycle time (all channels), min.		625 µs
Current signal at analog output	Yes; -50 ... 50 mA	Yes; -50 ... 50 mA
Output ranges, voltage		
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
• -20 mA to +20 mA	Yes; ±30 mA, ±50 mA	Yes; ±30 mA, ±50 mA
• 4 mA to 20 mA	Yes	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Technology modules

Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA vibration protection
Connection of actuators • for voltage output two-wire connection	Yes	Yes
Load impedance (in rated range of output) • with current outputs, max.	330 Ω; 150 ohms at ±50 mA	330 Ω; 150 ohms at ±50 mA
Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max.	24 bit	24 bit
Smoothing of measured values • parameterizable	Yes	Yes
Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max.	16 bit	16 bit
Encoder Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer	Yes Yes Yes	Yes Yes Yes
Connectable encoders • Single contact / changeover contact unconnected • 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes Yes 1.5 mA	Yes Yes 1.5 mA
Interrupts/diagnostics/status information Diagnostics function Substitute values connectable	Yes Yes	Yes Yes
Alarms • Diagnostic alarm	Yes	Yes
Diagnoses • Monitoring the supply voltage • Wire-break • Short-circuit to M • Short-circuit to L+ • Group error • Overflow/underflow	Yes Yes; AI 4 ... 20 mA, AQ, DQ, DI 0 ... 3 Yes; Encoder supply to M, channel by channel Yes; Analog inputs Yes Yes	Yes Yes; AI 4 ... 20 mA, AQ, DQ, DI 0 ... 3 Yes; Encoder supply to M, channel by channel Yes; Analog inputs Yes Yes
Diagnostics indication LED • RUN LED • MAINT LED • Monitoring of the supply voltage (PWR-LED) • for module diagnostics	Yes; green LED Yes; Yellow LED Yes; green PWR LED Yes; green/red DIAG LED	Yes; green LED Yes; Yellow LED Yes; green PWR LED Yes; green/red DIAG LED

Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA vibration protection
Integrated Functions		
Frequency measurement	Yes; Speed measurement	
Counting functions		
• Continuous counting	Yes	
• Counter response parameterizable	Yes	
• Hardware gate via digital input	Yes	
• Software gate	Yes	
Measuring functions		
• Dynamic measurement period adjustment	Yes; Speed measurement	
Measuring range		
- Frequency measurement, min.	0.1 Hz	
- Frequency measurement, max.	70 kHz; 70 kHz for DI; 7 kHz for DI/DQ; each for P/M encoder and 50 m cable length; 10 kHz for DI; 0.7 kHz for DI/DQ; each for P encoder and 50 m cable length	
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C; Observe derating	70 °C; Observe derating
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	3 500 m	3 500 m
Dimensions		
Width	22.5 mm	22.5 mm
Height	115 mm	115 mm
Depth	138 mm	138 mm
Weights		
Weight, approx.	200 g	200 g

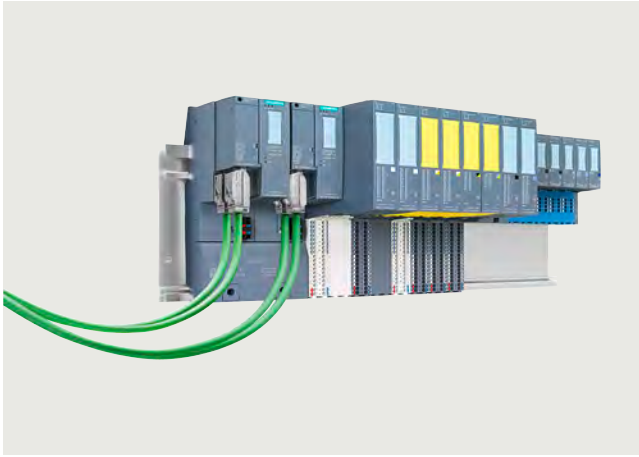
I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Fail-safe I/O-modules

Overview



Fail-safe I/O modules permit safety-oriented monitoring and thus, when required, bringing the plant to the defined safe state. The communication and integration into the process control system is enabled with the proven technology SIMATIC Safety Integrated. The fail-safe I/O modules for DI, DQ and AI correspond to the size of the standard modules and are certified by the German Technical Inspectorate up to SIL 3 per channel. All fail-safe I/O modules can be set up in redundant configuration guaranteeing not only fail-safe operation but also highest availability. SIMATIC ET 200SP HA is perfectly adapted for demanding fail-safe and standard applications in the manufacturing and process industries when high availability and PROFINET R1 redundancy are imperative.

- <https://www.siemens.com/process-safety>

Ordering data

Article No.

F-DI 16x24VDC HA digital input module

16 digital inputs 24 V DC, color code CC01, for terminal block type H1 and M1, channel diagnostics

6DL1136-6BA00-0PH1

F-DQ 10x24VDC/2A HA digital output module

10 digital outputs 24 V DC, 2 A, color code CC01, for terminal block type H1 and M1, channel diagnostics

6DL1136-6DA00-0PH1

F-AI 8xI 2-/4-wire HART HA analog input module

8 digital inputs, color code CC00, for terminal block type H1 and F1, channel diagnostics

6DL1136-6AA00-0PH1

Note:

The use of fail-safe modules requires SIMATIC S7 F systems.

Overview



ET200SP_Ex_IO_withPM

The intrinsically safe ET 200SP HA Ex I/O modules extend the SIMATIC ET 200SP HA and SIMATIC ET 200SP distributed I/O systems with the option of integrating devices located in hazardous areas (intrinsically safe sensors, actuators and HART field devices) into the system.

The ET 200SP HA Ex I/O modules with device protection according to intrinsic safety "i" offer channel outputs in Zone 0 or 1. 2-channel HART analog input and output modules and 2/4-channel digital input and output modules with different characteristic curves as well as a power module for intrinsically safe power supply of the modules.

Separate Ex isolators with correspondingly complex wiring and high space requirements are no longer required. The I/O modules can be installed up to ATEX Zone 2 and offer intrinsically safe circuits in Ex ia design for field devices up to Zone 0.

The Ex modules offer channel diagnostics and Configuration in Run and are approved for ambient temperatures from -40 to +70 °C.

Ordering data

Article No.

Ex digital modules SIMATIC ET 200SP HA	
Digital Ex-i input module, Ex-DI 4xNAMUR Suitable for BaseUnit Type X1, channel diagnostics	6DL1131-6TD00-0HX1
Digital Ex-i output module Ex-DQ 2x23,1VDC/20 mA Suitable for BaseUnit Type X1, channel diagnostics	6DL1132-6EB00-0HX1
Digital Ex-i output module Ex-DQ 2x17,4VDC/27 mA Suitable for BaseUnit Type X1, channel diagnostics	6DL1132-6CB00-0HX1
Ex analog modules SIMATIC ET 200SP HA	
Analog Ex-i HART input module, Ex-AI 2xI 2-wire HART Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.3%	6DL1134-6TB00-0HX1
Analog Ex-i input module, Ex-AI 4xTC/2xRTD 2-/3-/4-wire Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.05%	6DL1134-6JD00-0HX1
Analog Ex-i HART output module, Ex-AQ 2xI HART HF Suitable for BaseUnit Type X1, channel diagnostics, 16 bits, +/-0.3%	6DL1135-6TB00-0HX1
Power module and BaseUnits	
Power module Ex-PM E 24 V 0.8 A, W x H: 50 mm x 117 mm, suitable for BaseUnit Type W0	6DL1133-6PX00-0HW0
BU Type X1 for I/O modules Push-in terminals, W x H: 20 mm x 117 mm	6DL1193-6BP00-0BX1
BU Type W0 for Ex power module PM-E W x H: 50 mm x 117 mm	6DL1193-6BP00-0DW0

I/O systems

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

Ex I/O modules

Technical specifications

Article number	6DL1131-6TD00-0HX1 ET 200SP HA, EX-DI 4xNAMUR
General information	
Product type designation	Ex-DI 4xNAMUR
Product function	
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V16 or higher with HSP
• STEP 7 configurable/ integrated from version	STEP 7 V5.6 SP2 or higher
• PCS 7 configurable/ integrated from version	V9.1
Operating mode	
• DI	Yes
• Counter	Yes
• MSI	Yes
Encoder supply	
Number of outputs	4
Short-circuit protection	Yes
Digital inputs	
Number of digital inputs	4; NAMUR
Digital inputs, parameterizable	Yes
Pulse extension	Yes; 0.5 s, 1 s, 2 s
Time stamping	No
Edge evaluation	Yes; Positive edge, negative edge
Signal change flutter	Yes; 2 to 32 signal changes
Flutter observation window	Yes; 0.5 s, 1 s to 100 s in 1-s steps
Input voltage	
• Rated value (DC)	8.2 V
Input current	
for 10 k switched contact	
- for signal "0"	Max. 1.2 mA
- for signal "1"	Min. 2.1 mA
for unswitched contact	
- for signal "0", max. (permissible quiescent current)	0.5 mA
- for signal "1"	typ. 8 mA
for NAMUR encoders	
- for signal "0", min.	0.35 mA
- for signal "0", max.	1.2 mA
- for signal "1", min.	2.1 mA
- for signal "1", max.	6.4 mA
Input delay (for rated value of input voltage)	
for NAMUR inputs	
- at "0" to "1", max.	12 ms
- at "1" to "0", max.	12 ms
Encoder	
Connectable encoders	
• NAMUR encoder/changeover contact according to EN 60947	Yes
• Single contact / changeover contact unconnected	Yes
• Single contact / changeover contact connected with 10 kΩ	Yes
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Hardware interrupt	Yes; channel by channel

Article number	6DL1131-6TD00-0HX1 ET 200SP HA, EX-DI 4xNAMUR
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Monitoring of encoder power supply	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
• Group error	Yes
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Measuring functions	
Accuracy	
- Frequency measurement	1 %
Ex(i) characteristics	
maximum values for connecting terminals for gas group IIC	
• U _o (no-load voltage), max.	9.6 V
• I _o (short-circuit current), max.	61 mA; applies for up to four circuits connected in parallel
• P _o (power output), max.	145 mW; applies for up to four circuits connected in parallel
• C _o (permissible external capacity), max.	3.6 µF; applies for up to four circuits connected in parallel
• L _o (permissible external inductivity), max.	13 mH; applies for up to four circuits connected in parallel
• U _m (voltage at non-intrinsically safe connecting terminals), max.	60 V
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g

Technical specifications

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
General information		
Product type designation	Ex-AI 2xI 2-wire HART	Ex-AI 4xTC/2xRTD 2-/3-/4-wire
Product function		
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP
• STEP 7 configurable/ integrated from version	STEP 7 V5.6 SP2 or higher	STEP 7 V5.6 SP2 or higher
• PCS 7 configurable/ integrated from version	V9.1	V9.1
Operating mode		
• MSI	Yes	Yes
Analog inputs		
Number of analog inputs	2; Differential inputs	
• For current measurement	2	4
• For voltage measurement		2
• For resistance/resistance thermometer measurement		4
• For thermocouple measurement		0.5 mA
Constant measurement current for resistance-type transmitter, typ.		Yes; °C/°F/K
Cycle time (all channels), min.	3 ms	
Technical unit for temperature measurement adjustable		
Input ranges (rated values), voltages		
• -1 V to +1 V		Yes; 16 bit incl. sign
• -250 mV to +250 mV		Yes; 16 bit incl. sign
• -50 mV to +50 mV		Yes; 16 bit incl. sign
• -80 mV to +80 mV		Yes; 16 bit incl. sign
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes; 15 bit + sign	
Input ranges (rated values), thermocouples		
• Type B		Yes; 16 bit incl. sign
• Type C		Yes; 16 bit incl. sign
• Type E		Yes; 16 bit incl. sign
• Type J		Yes; 16 bit incl. sign
• Type K		Yes; 16 bit incl. sign
• Type L		Yes; 16 bit incl. sign
• Type N		Yes; 16 bit incl. sign
• Type R		Yes; 16 bit incl. sign
• Type S		Yes; 16 bit incl. sign
• Type T		Yes; 16 bit incl. sign
• Type U		Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST		Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer		
• Cu 10		Yes; 16 bit incl. sign
• Ni 100		Yes; 16 bit incl. sign
• LG-Ni 1000		Yes; 16 bit incl. sign
• Ni 120		Yes; 16 bit incl. sign
• Ni 200		Yes; 16 bit incl. sign
• Ni 500		Yes; 16 bit incl. sign
• Pt 100		Yes; 16 bit incl. sign
• Pt 1000		Yes; 16 bit incl. sign
• Pt 200		Yes; 16 bit incl. sign
• Pt 500		Yes; 16 bit incl. sign

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Ex I/O modules

Technical specifications

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
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
Thermocouple (TC) Temperature compensation parameterizable		Yes
Cable length - shielded, max. - unshielded, max.	500 m; Ex characteristic values must be observed 300 m; Ex characteristic values must be observed	200 m; Ex characteristic values must be observed; line resistance at RTD (simple) max. 25 ohm; loop resistance at TC max. 8 kOhm
Analog value generation for the inputs Integration and conversion time/resolution per channel - Resolution with overrange (bit including sign), max. - Integration time, parameterizable - Interference voltage suppression for interference frequency f1 in Hz - Conversion time (per channel)	16 bit Yes; channel by channel 10 / 50 / 60 Hz	16 bit Yes; Channel-by-channel, results from the selected interference frequency suppression 16.6 / 50 / 60 Hz, channel-by-channel 180 / 60 / 50 ms, results from the selected interference frequency suppression
Smoothing of measured values - Number of smoothing levels - parameterizable	4; None; 4/8/16 times Yes	Yes; none, weak, medium, strong, channel-by-channel
Encoder Connection of signal encoders - for current measurement as 2-wire transducer - Burden of 2-wire transmitter, max.	Yes 750 Ω; At 20 mA input current	
Errors/accuracies Basic error limit (operational limit at 25 °C) - Voltage, relative to input range, (+/-) - Current, relative to input range, (+/-) - Resistance, relative to input range, (+/-)	0.2 % 0.05 %	0.05 % 0.05 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, f1 = interference frequency - Series mode interference (peak value of interference < rated value of input range), min. - Common mode voltage, max. - Common mode interference, min.	60 dB	70 dB 60 V; Applicable for use in non-hazardous areas; no common mode voltage permissible in hazardous areas 90 dB
Protocols HART protocol	Yes	

Technical specifications

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	Yes	Yes; two upper and two lower limit values in each case
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel	
• Group error	Yes	
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Ex(i) characteristics		
maximum values for connecting terminals for gas group IIC		
• U _o (no-load voltage), max.	26 V	5.9 V
• I _o (short-circuit current), max.	93 mA	18 mA
• P _o (power output), max.	605 mW	27 mW
• C _o (permissible external capacity), max.	99 nF	43 µF
• L _o (permissible external inductivity), max.	4 mH	110 mH
• U _i (intrinsically safe input voltage), max.	10 V	
• U _m (voltage at non-intrinsically safe connecting terminals), max.	60 V	60 V
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	55 g	55 g

I/O systems

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

Carrier modules

Overview

DIN rails

The DIN rail is required for fitting an ET 200SP HA station in the control cabinet. The IM carrier modules for interface modules, the carrier modules for the I/O modules and the server module are attached to the DIN rail.

The DIN rails are available in lengths of 482 mm (for installation in a 19-inch rack) and 1 500 mm (for maximum configuration and vertical installation in a cabinet).



IM single carrier module



IM redundant carrier module

IM carrier modules for interface modules

Two versions of the IM carrier modules for interface modules are available:

- IM single carrier module for 1 interface module, for single connection to PROFINET
- IM redundant carrier module for 2 interface modules, for redundant connection to PROFINET

The IM carrier modules connect the interface module to the backplane bus. They enable data exchange with the I/O modules.



Carrier module for I/O modules, 8-slot



Carrier module for I/O modules, 2-slot

Carrier modules for I/O modules

The slots for the I/O modules are created by the connection of these carrier modules to the terminal blocks.

Carrier modules for I/O modules are available in the following versions:

- Carrier module, 2-slot, with 2 slots for I/O modules
- Carrier module, 8-slot, with 8 slots for I/O modules
- Carrier module, 8-slot, with 8 slots for I/O modules, without Power Bus function

Overview



ET 200SP HA, server module

Server module

Server module and power bus cover complete the design of the ET 200SP HA. A server module and a power bus cover are supplied with each IM carrier module for the interface module.

Ordering data

Article No.

DIN rails for ET 200SP HA**482 mm (approx. 19 inch) DIN rail**

Including grounding screw and integrated DIN rail for fitting small components such as clamps, miniature circuit-breakers and relays

6DL1193-6MC00-0AA0**1 500 mm (approx. 59 inch) DIN rail**

Including grounding screw and integrated DIN rail for fitting small components such as clamps, miniature circuit-breakers and relays

6DL1193-6MD00-0AA0**Grounding screw**

For connecting PE to the DIN rail; essential for 1 500 mm DIN rail
20 units per packing unit

6ES7590-5AA00-0AA0**IM carrier modules for interface modules****Note:**

A server module and a power bus cover are supplied with each IM carrier module for the interface module.

IM single carrier module

Rack for 1 SIMATIC ET 200SP HA interface module for single connection to PROFINET

6DL1193-6BH00-0SM0**IM redundant carrier module**

Rack for 2 SIMATIC ET 200SP HA interface modules for redundant connection to PROFINET

6DL1193-6BH00-0RM0**Carrier modules for I/O modules****Carrier module, 2-slot**

Rack for 2 SIMATIC ET 200SP HA I/O modules

6DL1193-6GA00-0NN0**Carrier module 8-slot**

Rack for 8 SIMATIC ET 200SP HA I/O modules

6DL1193-6GC00-0NN0**Carrier module 8-slot**

Carrier without Power Bus, can only be operated with light-gray or black terminal blocks, for holding 8 I/O modules of the SIMATIC ET 200SP HA

6DL1193-6GC00-8NN0**Spare parts****Server module (spare part) for ET 200SP HA****6DL1193-6PA00-0AA0**

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Carrier modules

Technical specifications

Article number	6DL1193-6GA00-0NN0 CARRIER MODULE TWOFOLD	6DL1193-6GC00-0NN0 CARRIER MODULE EIGHTFOLD	6DL1193-6GC00-8NN0 CARRIER MODULE EIGHTFOLD w/o PB
General information			
Product type designation	Carrier module 2 times	Carrier module 8 times	carrier module 8x without power bus
Product function			
• I&M data	Yes; Asset data	Yes; Asset data	Yes; Asset data
Hardware configuration			
Slots			
• Number of slots	2	8	8; for light gray and black terminal blocks
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C
Dimensions			
Width	52.5 mm; 45 mm when installed	187.5 mm; 180 mm when installed	187.5 mm; 180 mm when installed
Height	203 mm	203 mm	203 mm
Depth	79 mm	79 mm	79 mm
Weights			
Weight, approx.	111 g	450 g	270 g

Overview

The slots for the I/O modules are created by connecting carrier modules and terminal blocks. The terminal blocks contain the process terminals for connecting sensors, actuators and other devices.

Select the terminal block for the slot of an I/O module based on the following dependencies:

The following table illustrates the terminal block / I/O module assignment (x = standard):

I/O modules in 24 V range (with push-in terminal blocks)

I/O module	TB type H1	TB type M1 (IO-RED)	TB type F1 (F-AI IO-RED)	TB type P0 (32x L+)	TB type N0 (32x M)
DI 16x24V	x	x			x ^{c)}
DI 32x24V	x ^{a)}			x	
DI 16xNAMUR	x	x			x ^{c)}
DQ 16x24V / 0.5A	x	x			x ^{c)}
DQ 32x24V / 0.5A	x ^{b)}				x
DI-AI 16x / DQ 16x HART	x	x			x ^{c)}
AI 16xI HART	x	x			x ^{c)}
AI 16xTC 8xRTD	x	x			
AQ 8xI HART	x	x			x ^{c)}
F-DI 16x24V	x	x			x ^{c)}
F-DQ 10x24V / 2A	x	x			x ^{c)}
F-AI 8xI HART	x		x		x ^{c)}
					
Power bus infeed	Light gray	Light gray		Light gray	Light gray
Power bus continuer	Dark gray	Dark gray		Dark gray	Dark gray
No power bus			Black		

a) Encoder supply must be realized separately

b) Ground points must be realized separately

c) Offers 32 additional ground points for field connection

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Terminal blocks

Overview

I/O modules in 24 V range (with D-SUB terminal blocks)

I/O module	TB type H0 (D-SUB)	TB type M0 (D-SUB, IO-RED)	TB type F0 (D-SUB, F-AI, IO-RED)
DI 16x24V	x	x	
DI 32x24V	x ^{a)}		
DI 16xNAMUR	x	x	
DQ 16x24V / 0.5A	x	x	
DQ 32x24V / 0.5A	x ^{b)}		
DI-AI 16x / DQ 16x HART	x	x	
AI 16xI HART	x	x	
AI 16xTC 8xRTD	x ^{c)}	x ^{c)}	
AQ 8xI HART	x	x	
F-DI 16x24V	x	x	
F-DQ 10x24V / 2A	x	x	
F-AI 8xI HART	x		x
			
Power bus infeed			
Power bus continuer			
No power bus	Black	Black	Black

^{a)} Encoder supply must be realized separately

^{b)} Ground points must be realized separately

^{c)} No temperature compensation for TC

Overview

I/O modules with voltages >24 V (with push-in terminal blocks)**I/O modules with channel-selective isolation (with push-in and D-SUB terminal blocks)**

I/O module	TB type K0 (ISOL)	TB type L0 (ISOL, IO-RED)	TB type S0 (D-SUB, ISOL)	TB type R0 (D-SUB, ISOL, IO-RED)
DI 8x24 ... 125V DC	x			
DI 8x230VAC	x			
RQ 4x120-230V / 5A CO	x			
AI 4xI HART ISOL	x	x	x	x
AQ 4xI HART ISOL	x	x	x	x
				
Power bus infeed	Light gray	Light gray		
Power bus continuer	Dark gray			
No power bus			Black	Black

Potential groups/color type of the terminal blocks

To help you distinguish between potential groups on an ET 200SP HA station, the terminal blocks come in different colors:

- Light gray terminal blocks are for feeding in and start a new potential group.
- Dark gray terminal blocks forms a contact with the supply voltage of the terminal block to its left, thus extending the potential group.
- Black terminal blocks do not support any potential groups and must be fed in manually. Dark gray terminal blocks must not be inserted to the right of them.

Note the maximum permissible load current depending on the number of I/O modules:

Number of terminal blocks	Permissible load current in amperes
4	10 A
5	8 A
6	7 A
7	6 A
8	5 A
10	4 A
15	3 A
20	2 A

I/O systems

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

Terminal blocks

Ordering data

Article No.

Terminal blocks 24 V DC (push-in)

Terminal block type H1 light gray For starting a new potential group, with 32 push-in terminals, width 22.5 mm, with temperature compensation	6DL1193-6TP00-0DH1
Terminal block type H1 dark gray For forwarding a potential group, with 32 push-in terminals, width 22.5 mm, with temperature compensation	6DL1193-6TP00-0BH1
Terminal block type M1 light gray For starting a new potential group, with 32 push-in terminals, width 45 mm, for redundant configurations, with temperature compensation	6DL1193-6TP00-0DM1
Terminal block type M1 dark gray For forwarding a potential group, with 32 push-in terminals, width 45 mm, for redundant configurations, with temperature compensation	6DL1193-6TP00-0BM1
Terminal block, type F1, F-AI, IO-RED 32 push-in terminals, width 45 mm, for redundant configuration with fail-safe analog module F-AI, no power bus	6DL1193-6TP00-0DF1
Terminal block type P0 light gray For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals with encoder supply, width 45 mm, specifically for use with DI 32x24 V DC (6DL1131-6BL00-0PH1)	6DL1193-6TP00-0DP0
Terminal block type P0 dark gray For forwarding a potential group, with 32 push-in terminals, additional 32 push-in terminals with encoder supply, width 45 mm, specifically for use with DI 32x24 V DC (6DL1131-6BL00-0PH1)	6DL1193-6TP00-0BP0
Terminal block type N0 light gray For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals for ground connection, width 45 mm, for use with DQ 32x 24 V DC (6DL1132-6BL00-0PH1) and other modules	6DL1193-6TP00-0DN0
Terminal block type N0 dark gray For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals for ground connection, width 45 mm, for use with DQ 32x 24 V DC (6DL1132-6BL00-0PH1) and other modules	6DL1193-6TP00-0BN0

Article No.

Terminal blocks 24 V DC (D-SUB)

Terminal block, type H0, D-SUB D-SUB plug 37-pin, 24 V infeed per TB, width 22.5 mm, no power bus	6DL1193-6TC00-0DH0
Terminal block, type M0, D-SUB, IO-RED D-SUB plug 37-pin, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	6DL1193-6TC00-0DM0
Terminal block, type F0, D-SUB, F-AI, IO-RED D-SUB connector 37-pin, for fail-safe analog input, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	6DL1193-6TC00-0DF0
Terminal block, type S0, D-SUB, ISOL D-SUB plug 37-pin, 24 V infeed per TB, width 22.5 mm	6DL1193-6TC00-0DS0
Terminal block, type R0, D-SUB, ISOL, IO-RED D-SUB plug 37-pin, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	6DL1193-6TC00-0DR0

Terminal blocks insulated (24 V DC / 125 V DC / 230 V AC)

Terminal block type K0 light gray For starting a new potential group, with 16 push-in terminals, width 22.5 mm	6DL1193-6TP00-0DK0
Terminal block type K0 dark gray For forwarding a potential group, with 16 push-in terminals, width 22.5 mm	6DL1193-6TP00-0BK0
Terminal block type L0 light gray For starting a new potential group, with 16 push-in terminals, width 45 mm	6DL1193-6TP00-0DL0

Accessories

Shield connection for terminal block 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0
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Technical specifications

Article number	6DL1193-6TC00-0DH0 TERMINAL BLOCK, TYPE H0, D-SUB	6DL1193-6TC00-0DM0 TERMINALBLOCK, TYPE M0, D-SUB, IO-RED	6DL1193-6TC00-0DF0 TERMINALBLOCK, TYPE F0, D-SUB, F-AI, RED	6DL1193-6TC00-0DS0 TERMINALBLOCK, TYPE S0, D-SUB, ISOL	6DL1193-6TC00-0DR0 TERMINALBLOCK, TYPE R0, D-SUB, ISOL, RED
General information					
Product type designation	type H0, SUB-D	type M0, D-SUB, IO-RED		type S0, D-SUB, ISOL	type R0, D-SUB, ISOL, IO-RED
Product function					
• I&M data	Yes; Asset data	Yes; Asset data	Yes; Asset data	Yes; Asset data	Yes; Asset data
Hardware configuration					
Slots					
• Number of slots	1	2; For IO redundancy	2; For IO redundancy	1	2; For IO redundancy
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
Dimensions					
Width	22.5 mm	45 mm	45 mm	22.5 mm	45 mm
Height	175 mm	175 mm	175 mm	175 mm	175 mm
Depth	77 mm	77 mm	77 mm	77 mm	77 mm
Weights					
Weight, approx.	92 g	158 g	156 g	92 g	158 g

Article number	6DL1193-6TP00-0DK0 TERMINAL BLOCK, TYPE K0, LIGHT-GREY	6DL1193-6TP00-0BK0 TERMINAL BLOCK, TYPE K0, DARK-GREY	6DL1193-6TP00-0DL0 TERMINAL BLOCK, TYPE L0, LIGHT-GREY
General information			
Product type designation	Type K0	Type K0	type L0
Product function			
• I&M data	Yes; Asset data	Yes; Asset data	Yes; Asset data
Hardware configuration			
Slots			
• Number of slots	1	1	2; For IO redundancy
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C
Dimensions			
Width	22.5 mm	22.5 mm	45 mm
Height	175 mm	175 mm	175 mm
Depth	77 mm	77 mm	77 mm
Weights			
Weight, approx.	78 g	78 g	148 g

I/O systems

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

BusAdapter

Overview



BusAdapter BA 2xRJ45, 2xFC and 2xLC

BusAdapter

A BusAdapter as a separate component allows a free choice of connection technology:

- 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
- BA LC/RJ45: 1 optical connection and 1 electrical connection for bus cable with standard RJ45 connector
- BA LC/FC: 1 optical connection and 1 electrical connection for direct connection of FastConnect bus cable
- BA 2xRJ45 (VD): 2 electrical connections for using PROFINET via existing PROFIBUS cables

Ordering data

Article No.

BusAdapter	
BusAdapter 2xRJ45 2 × RJ45 sockets for PROFINET (standard Ethernet socket)	6DL1193-6AR00-0AA0
BusAdapter 2xFC 2 × FastConnect (FC) connections for PROFINET	6DL1193-6AF00-0AA0
BusAdapter 2xLC 2 × glass fiber-optic connections for PROFINET	6DL1193-6AG00-0AA0
BusAdapter BA LC/RJ45 2 × glass fiber-optic connections	6DL1193-6AG20-0AA0
BusAdapter BA LC/FC 2 × glass fiber-optic connections	6DL1193-6AG40-0AA0
BusAdapter BA 2xRJ45 (VD) 2 × electrical connections for Ethernet communication via 2-, 4- or 8-wire copper cables and distances up to 500 m	6GK5991-2VA00-8AA2

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 2x RJ45	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
Supports protocol for PROFINET IO			
• Number of RJ45 ports	2	2	2
• Number of FC (FastConnect) connections			
• Number of LC ports			
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

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
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

Article number	6DL1193-6AG20-0AA0 ET 200SP HA, BUSADAPTER BA LC/RJ45	6DL1193-6AG40-0AA0 ET 200SP HA, BUSADAPTER BA LC/FC
General information		
Product type designation	BA LC/RJ45	BA LC/FC
Interfaces		
Number of PROFINET interfaces	1; 2 ports (switch) LC / RJ45	1; 2 ports (switch) LC / FC
Supports protocol for PROFINET IO		
• Number of RJ45 ports	1	1
• Number of FC (FastConnect) connections		
• Number of LC ports	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX
Cable length		
- Cu conductors	100 m	100 m
- Multimode graded-index fiber 50/125 µm	3 km	3 km
- Multimode graded-index fiber 62.5/125 µm	3 km	3 km
Standards, approvals, certificates		
RoHS conformity	Yes	Yes
China RoHS compliance	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	70 °C; = Tmax for horizontal installation; for vertical installation Tmax = 60 °C; redundant setup (2x 6DL1155-6AU00-0PM0): max. 65 °C horizontally, max. 60 °C vertically. When using different IO Devices, the derating specified there must be observed.	65 °C; = Tmax for horizontal installation; for vertical installation Tmax = 60 °C; redundant setup (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontally, max. 55 °C vertically. When using different IO Devices, the derating specified there must be observed.
Dimensions		
Width	20 mm	20 mm
Height	75 mm; Without protective caps (approx. 8 mm)	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm
Weights		
Weight, approx.	32 g	50 g

Article number	6GK5991-2VA00-8AA2
product type designation	BA 2xRJ45VD HA
suitability for use	Ethernet transmission via 2, 4 and 8-wire line
suitability for operation	Products with BusAdapter interface (requirement: the BusAdapter is approved in the firmware of the basic unit)
Interfaces	
number of electrical connections	
• for network components or terminal equipment maximum	2
number of 10/100 Mbit/s RJ45 ports	2
type of electrical connection	
• for network components or terminal equipment	RJ45

Article number	6GK5991-2VA00-8AA2
product type designation	BA 2xRJ45VD HA
operating mode	
• standard Ethernet	Yes
• VD	Yes; Depending on number of wires (2, 4 or 8-wire)
standards, specifications, approvals	
certificate of suitability	
• CCC for hazardous zone according to GB standard	Yes

I/O systems

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

Additional I/O modules

Overview

Extending the SIMATIC ET 200SP HA system with specific additional I/O modules from the SIMATIC ET 200SP system gives you more options and flexibility.

When these I/O modules are used, the following aspects need to be considered:

- Special slot rules apply (see System Manual for the SIMATIC ET 200SP HA)
- Module redundancy is not supported for the additional I/O modules
- Attention must be paid to the specific properties of the additional I/O modules, such as ambient temperature, painting, insulation protection. These are usually limited compared to the ET 200SP HA I/O modules
- Before use, check whether (Library) Support is already available for the desired purpose

Note:

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Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners.

Ordering data

Article No.

CM PtP communications module

For serial communication connections with RS232, RS422, RS485 interfaces, BU type A0, color code CC00

- CM PtP communications module (V2)

6ES7137-6AA01-0BA0

Analog input module

- AI Energy Meter CT HF, for 1 A or 5 A current transformers, with line analysis functions, channel diagnostics; BU type U0

6ES7134-6PA01-0CU0

- AI Energy Meter RC HF, for Rogowski coils or 333 mV current/voltage transformers, with line analysis functions, channel diagnostics; BU type U0

6ES7134-6PA21-0CU0

TM SIWAREX WP321 weighing module

Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 × LC, 1 × RS 485.

7MH4138-6AA00-0BA0

TM SIWAREX WP351 HF weighing module

SIMATIC ET 200SP, TM SIWAREX WP351 HF, legal-for-trade weighing module for automatic dosing, filling and checking scales and totalizing weighing instruments

7MH4138-6BA00-0CU0

Motor starters

Direct starter

- Adjustment range 0.1 ... 0.4 A
- Adjustment range 0.3 ... 1 A
- Adjustment range 0.9 ... 3 A
- Adjustment range 2.8 ... 9 A
- Adjustment range 4 ... 12 A

3RK1308-0AA00-0CP0
3RK1308-0AB00-0CP0
3RK1308-0AC00-0CP0
3RK1308-0AD00-0CP0
3RK1308-0AE00-0CP0

Reversing starter

- Adjustment range 0.1 ... 0.4 A
- Adjustment range 0.3 ... 1 A
- Adjustment range 0.9 ... 3 A
- Adjustment range 2.8 ... 9 A
- Adjustment range 4 ... 12 A

3RK1308-0BA00-0CP0
3RK1308-0BB00-0CP0
3RK1308-0BC00-0CP0
3RK1308-0BD00-0CP0
3RK1308-0BE00-0CP0

SITRANS FCT070

Transmitter for ET 200SP

7ME4138-6AA00-0BB1

AirLINE SP valve terminal type 8647 for integration into ET 200SP HA

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly:
<https://www.burkert-usa.com/en/type/8647>

* Disclaimer of liability

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