

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Overview



- Compact block I/O for processing digital, analog and IO-Link signals for connecting to the PROFINET bus system
- Cabinet-free design in IP65/66/67 degree of protection with M12 connections
- Extremely rugged and resistant metal enclosure and casting

- Compact module in two types of enclosures:
 - 30 mm x 200 mm x 37 mm (W x H x D, long and narrow enclosure), with 4 x M12 for digital signals
 - 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure), with 8 x M12 for digital signals and IO-Link
 - 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure) with 4 x M12 or 8 x M12 for analog signals
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- Data transmission rate 100 Mbps
- LLDP proximity detection without PG and fast startup (boot up within approx. 0.5 seconds)
- Supply and load voltage connection: 2 x M12
- Module variance:
 - 8 DI
 - 16 DI
 - 8 DO (2 A)
 - 8 DO (1.3 A)
 - 8 DO (0.5 A)
 - 16 DO (1.3 A)
 - 8 DI/DO (1.3 A)
 - 8 AI (U, I, TC, RTD)
 - 8 AI (TC, RTD)
 - 4 AO (U, I)
 - 4 IO-Link
 - 4 IO-Link + 8 DI + 4 DO (1.3 A)
- Channel-specific diagnostics
- Ambient temperature range -40 °C to 60 °C

Technical specifications

Article number	6ES7141-6BF00-0AB0	6ES7141-6BG00-0AB0	6ES7141-6BH00-0AB0
	ET 200ECO PN, 8DI, DC24V, 4XM12	ET 200ECO PN, 8DI, DC24V, 8XM12	ET 200ECO PN, 16DI, DC24V, 8XM12
General information			
Vendor identification (VendorID)	002AH	002AH	002AH
Device identifier (DeviceID)	0306H	0306H	0306H
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Input current			
Current consumption, typ.	100 mA	100 mA	100 mA
Encoder supply			
Number of outputs	4	8	8
Short-circuit protection	Yes; Electronic	Yes; Electronic	Yes; Electronic
Output current			
• Rated value	100 mA; per output	100 mA; per output	100 mA; per output
Power loss			
Power loss, typ.	5.5 W	4.5 W	6.5 W
Digital inputs			
Number of digital inputs	8	8	16
• in groups of	2	1	2
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 60 °C, max.	8	8	16

Technical specifications (continued)

Article number	6ES7145-6HD00-0AB0 ET 200ECO PN, 4AO U/I 4XM12
General information	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
Current consumption, typ.	280 mA
Actuator supply	
Number of outputs	4
Short-circuit protection	Yes; Electronic at 1.4 A
Output current	
• Rated value	1 A; Maximum
Power loss	
Power loss, typ.	5.5 W
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	30 mA
Current output, no-load voltage, max.	20 V
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	600 Ω
• with current outputs, inductive load, max.	1 mH
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs towards MANA	28.8 V permanent, 35 V for max. 500 ms
Cable length	
• shielded, max.	30 m
Analog value generation for the outputs	
Analog value display	SIMATIC S7 format
Conversion principle	Resistor network
Integration and conversion time/resolution per channel	
• Resolution (incl. overrange)	15 bit + sign
• Conversion time (per channel)	1 ms

Article number	6ES7145-6HD00-0AB0 ET 200ECO PN, 4AO U/I 4XM12
Settling time	
• for resistive load	2 ms
• for capacitive load	1.8 ms
• for inductive load	2 ms
Errors/accuracies	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	U: ±0.6 mVrms; I: ±0.4 nArms
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	U: 0.001%/°C; I: 0.0025%/°C
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.008 %
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
PROFINET IO	
• Autocrossing	Yes
• automatic detection of transmission rate	Yes
• Transmission rate, max.	100 Mbit/s
• integrated switch	Yes
PROFINET IO Device	
- IRT with the option "high flexibility"	Yes
- Prioritized startup	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	No
Protocols (Ethernet)	
• TCP/IP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Diagnostic functions	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED
• Wire-break	Yes; Channel-by-channel with current output
• Short-circuit	Yes; Channel-by-channel with voltage output
• Group error	Yes; Red/yellow "SF/MT" LED

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Technical specifications (continued)

Article number	6ES7145-6HD00-0AB0 ET 200ECO PN, 4AO U/I 4XM12
Potential separation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Potential separation analog outputs	
• between the channels	No
Permissible potential difference	
between M internally and the outputs	10 Vpp AC

Article number	6ES7145-6HD00-0AB0 ET 200ECO PN, 4AO U/I 4XM12
Isolation	
tested with	
• 24 V DC circuits	707 V DC (type test)
• Interface	1 500 V; According to IEEE 802.3
Degree and class of protection	
IP degree of protection	IP65/67
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight (without packaging)	930 g

Article number	6ES7148-6JA00-0AB0 ET 200ECO PN: IO-LINK MASTER	6ES7148-6JD00-0AB0 ET 200eco PN: IO-Link master
General information		
Vendor identification (VendorID)	002AH	002AH
Device identifier (DeviceID)	0306H	0306H
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes; against destruction; load increasing
Input current		
Current consumption, typ.	200 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A
from load voltage 2L+, max.	4 A	4 A
Encoder supply		
Number of outputs	6	4
Short-circuit protection	Yes	Yes; per channel, electronic
Output current		
• Rated value	200 mA; 100 mA per output to X5-X6	500 mA; Per channel
Power loss		
Power loss, typ.	8 W	4.8 W
Digital inputs		
Number of digital inputs	8	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	
Number of simultaneously controllable inputs		
all mounting positions		
- up to 60 °C, max.	8	
Input voltage		
• Rated value (DC)	24 V	
• for signal "0"	-3 to +5V	
• for signal "1"	+11 to +30V	
Input current		
• for signal "0", max. (permissible quiescent current)	1.5 mA	
• for signal "1", typ.	7 mA	

Ordering data	Article No.		Article No.
ET 200eco PN digital input modules		PROFINET M12 connector, for user assembly	
• 8 DI 24 V DC; 4 x M12, dual assignment, IP67 degree of protection	6ES7141-6BF00-0AB0	IE FC M12 PRO connector, for user assembly	
• 8 DI 24 V DC; 8 x M12, IP67 degree of protection	6ES7141-6BG00-0AB0	• 1 unit	6GK1901-0DB20-6AA0
• 16 DI 24 V DC; 8 x M12, dual assignment, IP67 degree of protection	6ES7141-6BH00-0AB0	• 8 units	6GK1901-0DB20-6AA8
ET 200eco PN digital output modules		PROFINET M12 connecting cables	
• 8 DO 24 V DC/0.5 A; 4 x M12, dual assignment, 1 load voltage supply DO; IP67 degree of protection	6ES7142-6BF50-0AB0	Pre-assembled connecting cables with 2 M12 connectors (D-coded) in various lengths:	
• 8 DO 24 V DC/1.3 A; 4 x M12, dual assignment, IP67 degree of protection	6ES7142-6BF00-0AB0	0.3 m	6XV1870-8AE30
• 8 DO 24 V DC/1.3 A; 8 x M12, IP67 degree of protection	6ES7142-6BG00-0AB0	0.5 m	6XV1870-8AE50
• 8 DO 24 V DC/2 A; 8 x M12, IP67 degree of protection	6ES7142-6BR00-0AB0	1.0 m	6XV1870-8AH10
• 16 DO 24 V DC/1.3 A; 8 x M12, dual assignment, IP67 degree of protection	6ES7142-6BH00-0AB0	1.5 m	6XV1870-8AH15
		2.0 m	6XV1870-8AH20
		3.0 m	6XV1870-8AH30
		5.0 m	6XV1870-8AH50
		10.0 m	6XV1870-8AN10
		15.0 m	6XV1870-8AN15
ET 200eco PN digital input/output modules		M12 connector for 24 V DC load power supply	
• 8 DI/DO 24 V DC/1.3 A; 8 x M12, IP67 degree of protection	6ES7147-6BG00-0AB0	Connection socket for 24 V DC incoming supply; 4-pin, A-coded, 3 units	6GK1907-0DC10-6AA3
ET 200eco PN analog input modules		Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units	6GK1907-0DB10-6AA3
• 8 AI 4 U/I + 4 RTD/TC; 8 x M12, IP67 degree of protection	6ES7144-6KD00-0AB0		
• 8 AI RTD/TC; 8 x M12, IP67 degree of protection	6ES7144-6KD50-0AB0	M12 plug-in power cables	
ET 200eco PN analog output modules		Pre-assembled plug-in power cables, fitted at each end with M12 socket and plug 4 x 0.75 mm ² , in various lengths:	
• 4 AO U/I; 4 x M12, IP67 degree of protection	6ES7145-6HD00-0AB0	0.3 m	6XV1801-5DE30
ET 200eco PN IO-Link master modules		0.5 m	6XV1801-5DE50
• 4 IO-L + 8 DI + 4 DO, 24 V DC/1.3 A; 8 x M12, IP67 degree of protection, enclosure width 60 mm; for connecting up to 4 IO-Link devices according to IO-Link Specification V1.0 and port Class A as well as 8 digital inputs and 4 digital outputs	6ES7148-6JA00-0AB0	1.0 m	6XV1801-5DH10
• 4 IO-L; 4 x M12, IP67 degree of protection, enclosure width 30 mm; for con- necting up to 4 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B	6ES7148-6JD00-0AB0	1.5 m	6XV1801-5DH15
		2.0 m	6XV1801-5DH20
		3.0 m	6XV1801-5DH30
		5.0 m	6XV1801-5DH50
		10.0 m	6XV1801-5DN10
		15.0 m	6XV1801-5DN15
Accessories		M12 coupler plug	
• PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12	6ES7148-6CB00-0AA0	Can be assembled, for connecting actuators or sensors, 5-pin	3RK1902-4BA00-5AA0
• Terminal block for ET 200eco PN, 10 A insulation displacement terminals	6ES7194-6CA00-0AA0	M12 Y cable	
• Spare fuses for terminal block, 10 units	6ES7194-6HB00-0AA0	For double connection of I/O by means of single cable to ET 200, 5-pin	6ES7194-6KA00-0XA0
• DIN rail 0.5 m	6ES7194-6GA00-0AA0		
• Profile screw for DIN rail, 50 units	6ES7194-6MA00-0AA0		
• M12 sealing cap for IP67 modules, 10 units	3RX9802-0AA00		
• Labels 10 x 7 mm, pastel turquoise, 816 units	3RT1900-1SB10		