

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

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Technical specifications (continued)

Article number	6ES7144-6KD00-0AB0 ET 200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	6ES7144-6KD50-0AB0 ET 200ECO PN, 8AI RTD/TC 8XM12
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; against destruction
Input current		
Current consumption, typ.	110 mA	110 mA
Encoder 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.	2.8 W	2.8 W
Analog inputs		
Number of analog inputs	8	8
• For voltage/current measurement	4	
• For resistance/resistance thermometer measurement	4	8
permissible input voltage for voltage input (destruction limit), max.	28.8 V permanent, 35 V for max. 500 ms	
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• -20 mA to +20 mA	Yes	
• 4 mA to 20 mA	Yes	
Input ranges (rated values), thermocouples		
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
Input ranges (rated values), resistance thermometer		
• Ni 100	Yes	Yes
• Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Ni 200	Yes	Yes
• Ni 500	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes
Input ranges (rated values), resistors		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
• 0 to 3000 ohms	Yes	Yes

Technical specifications (continued)

Article number	6ES7144-6KD00-0AB0 ET 200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	6ES7144-6KD50-0AB0 ET 200ECO PN, 8AI RTD/TC 8XM12
Thermocouple (TC)		
Temperature compensation		
- parameterizable	Yes	Yes
- internal temperature compensation	Yes	Yes
- external temperature compensation with compensations socket	Yes	Yes
- external temperature compensation with Pt100		Yes
- dynamic reference temperature value		Yes
- for definable comparison point temperature		Yes
Cable length		
• shielded, max.	30 m	30 m
Analog value generation for the inputs		
Analog value display	SIMATIC S7 format	SIMATIC S7 format
Measurement principle	integrating	integrating
Integration and conversion time/resolution per channel		
• Resolution (incl. overrange)	15 bit + sign	15 bit + sign
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	2/16.67/20/100 ms	2/16.67/20/100 ms
• Interference voltage suppression for interference frequency f1 in Hz	500 / 60 / 50 / 10 Hz	500 / 60 / 50 / 10 Hz
• Conversion time (per channel)	4 / 19 / 22 / 102 ms	4 / 19 / 22 / 102 ms
Smoothering of measured values		
• parameterizable	Yes	Yes
• Step: None	Yes; 1 x cycle time	Yes; 1 x cycle time
• Step: low	Yes; 4 x cycle time	Yes; 4 x cycle time
• Step: Medium	Yes; 16 x cycle time	Yes; 16 x cycle time
• Step: High	Yes; 64 x cycle time	Yes; 64 x cycle time
Encoder		
Number of connectable encoders, max.	8	8
Connection of signal encoders		
• for voltage measurement	Yes	
• for current measurement as 2-wire transducer	Yes	
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with two-wire connection	Yes	Yes
• for resistance measurement with three-wire connection	Yes	Yes
• for resistance measurement with four-wire connection	Yes	Yes
Errors/accuracies		
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	U: 0.0035%/°C; I: 0.006%/°C; RTD: 0.0005%/°C; TC: 0.0035%/°C	RTD: 0.0005%/°C; TC: 0.0035%/°C
Crosstalk between the inputs, min.	85 dB	-85 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %	0.008 %
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.	46 dB	46 dB
• Common mode interference, min.	70 dB	70 dB

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Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
PROFINET IO		
• Autocrossing	Yes	Yes
• automatic detection of transmission rate	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
• integrated switch	Yes	Yes
PROFINET IO Device		
- IRT with the option "high flexibility"	Yes	
- Prioritized startup	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	No
Protocols (Ethernet)		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/status information		
Status indicator	Yes	
Diagnostic functions	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Short-circuit encoder supply	Yes; per module	
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
• Overflow/underflow	Yes	Yes
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation analog inputs		
• between the channels	No	No
Permissible potential difference		
Between the inputs and MANA (UCM)	10 Vpp AC	10 Vpp AC
Isolation		
tested with		
• 24 V DC circuits	707 V DC (type test)	707 V DC (type test)
• Interface	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Dimensions		
Width	60 mm	60 mm
Height	175 mm	175 mm
Depth	49 mm	49 mm
Weights		
Weight (without packaging)	930 g	930 g

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
		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
	6ES7148-6JD00-0AB0	M12 coupler plug	
Accessories		Can be assembled, for connecting actuators or sensors, 5-pin	3RK1902-4BA00-5AA0
• PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12	6ES7148-6CB00-0AA0	M12 Y cable	
• Terminal block for ET 200eco PN, 10 A insulation displacement terminals	6ES7194-6CA00-0AA0	For double connection of I/O by means of single cable to ET 200, 5-pin	6ES7194-6KA00-0XA0
• Spare fuses for terminal block, 10 units	6ES7194-6HB00-0AA0		
• 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		