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Data sheet 6ES7148-6JE00-0BB0

Siemens EcoTech

SIMATIC ET 200eco PN, CM 4x IO-Link + DIQ 12x 24 V DC/0.5 A/2 A, M12-L, 8x M12, 4x port class A channel diagnostics, shared device, with 2 controllers, prioritized startup, MRP, S2 redundancy, I&M0...3, multi-fieldbus, PN IO, EtherNet/IP, Modbus TCP, degree of protection IP67 / IP69K



General information	
HW functional status	From FS03
Firmware version	V5.1.x
● FW update possible	Yes
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
Manufacturer ID according to ODVA (VendorID)	04E3H
Device ID according to ODVA (Product code)	0FADH
Product function	
● I&M data	Yes; I&M0 to I&M3
● Isochronous mode	No
● IRT	Yes
● Prioritized startup	Yes
Engineering with	
● STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 or higher with HSP 0378
● PROFINET from GSD version/GSD revision	GSDML V2.4.x
● Multi Fieldbus Configuration Tool (MFCT)	V1.4.1 or higher
Operating mode	
● IO-Link	Yes
● DI	Yes
● DQ	Yes
● MSI	Yes
● MSO	Yes
Supply voltage	
power supply according to NEC Class 2 required	No
Load voltage 1L+	
● Rated value (DC)	24 V
● permissible range, lower limit (DC)	20.4 V
● permissible range, upper limit (DC)	28.8 V
● Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
● Rated value (DC)	24 V
● permissible range, lower limit (DC)	20.4 V
● permissible range, upper limit (DC)	28.8 V
● Reverse polarity protection	Yes; against destruction
Input current	

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Current consumption (rated value)	70 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	4
24 V encoder supply	
● Short-circuit protection	Yes; per channel, electronic
● Output current, max.	2 A; Per channel
Power loss	
Power loss, typ.	9.7 W
Address area	
Address space per module	
● Inputs	146 byte; + 8 bytes for QI information
● Outputs	130 byte
Hardware configuration	
Submodules	
● Number of configurable submodules, max.	6
Digital inputs	
Number of digital inputs	12; Parameterizable as DIQ
● in groups of	4
Digital inputs, parameterizable	Yes
Sourcing/sinking input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
— up to 60 °C, max.	12
Input voltage	
● Rated value (DC)	24 V
● for signal "0"	-3 to +5V
● for signal "1"	+11 to +30V
Input current	
● for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length	
● unshielded, max.	30 m
Digital outputs	
Number of digital outputs	12; Parameterizable as DIQ
● in groups of	2 load groups for 4 or 8 outputs each
Current-sourcing	Yes
output type acc. to IEC 61131, type 0.5	Yes
Short-circuit protection	Yes; per channel, electronic
● Response threshold, typ.	0.5 A: 1 A / 2 A: 3 A
Limitation of inductive shutdown voltage to	0.5 A: Type 1L+ (-70 V) / 2 A: Type (-18 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
● with resistive load, max.	0.5 A / 2 A
● with inductive load, max.	0.5 A / 2 A
● on lamp load, max.	0.5 A: 5 W / 2 A 10 W
Load resistance range	
● lower limit	0.5 A: 48 ohms / 2 A: 12 ohms
● upper limit	4 kΩ
Output voltage	
● for signal "1", min.	1L+ (-0.8 V) / 2L+ (-0.8 V)
Output current	
● for signal "1" rated value	0.5 A / 2 A
● for signal "1" permissible range, max.	0.5 A / 2 A
● for signal "0" residual current, max.	0.1 mA

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Output delay with resistive load	
● "0" to "1", max.	0.5 A: 100 µs / 2 A: 150 µs; at rated load
● "1" to "0", max.	0.5 A: 150 µs / 2 A: 2.5 ms; at rated load
Parallel switching of two outputs	
● for uprating	No
● for redundant control of a load	Yes
Switching frequency	
● with resistive load, max.	0.5 A: 100 Hz / 2 A: 40 Hz
● with inductive load, max.	0.5 Hz
● on lamp load, max.	1 Hz
Total current of the outputs	
● Current per group, max.	1L+: 2 A / 2L+: 5.5 A
● Current per module, max.	7.5 A
Cable length	
● unshielded, max.	30 m
Encoder	
Connectable encoders	
● 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
IO-Link	
Number of ports	4
● of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms
Size of process data, input per port	33 byte
Size of process data, input per module	132 byte
Size of process data, output per port	32 byte
Size of process data, output per module	128 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	possible with LIOLink_Master function block
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
Operating modes	
● IO-Link	Yes
● DI	Yes
● DQ	Yes; max. 100 mA
Connection of IO-Link devices	
● Port type A	Yes; via 3-core cable
● Port type B	No
● via three-wire connection	Yes
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
● M12 port	Yes; 2x M12, 4-pin, D-coded
● Number of ports	2
● integrated switch	Yes
Protocols	
● PROFINET IO device	Yes
● Open IE communication	Yes
PROFINET IO Device	
Services	
— IRT	Yes; 250 µs to 4 ms in 125 µs frame
— Prioritized startup	Yes
— Shared device	Yes

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— Number of IO Controllers with shared device, max.	2
Interface types	
M12 port	
● Autonegotiation	Yes
● Autocrossing	Yes
● Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
Redundancy mode	
● PROFINET system redundancy (S2)	Yes
— on S7-1500R/H	Yes
— on S7-400H	Yes
● PROFINET system redundancy (R1)	No
● H-Sync forwarding	Yes
Media redundancy	
— MRP	Yes
— MRPD	No
EtherNet/IP	
Services	
— CIP Implicit Messaging	Yes
— CIP Explicit Messaging	Yes
— CIP Safety	No
— Shared device	Yes; 2x EtherNet/IP Scanner
— Number of scanners with shared device, max.	2
Updating times	
— Requested Packet Interval (RPI)	2 ms
Redundancy mode	
— DLR (Device Level Ring)	No
Address area	
— Address space per module, max.	300 byte
— LargeForwardOpen (Class3)	No
Modbus TCP	
Services	
— read coils (code=1)	Yes
— read discrete inputs (code=2)	Yes
— Read Holding Registers (Code=3)	Yes
— write single coil (code=5)	Yes
— write multiple coils (code=15)	Yes
— Write Multiple Registers (Code=16)	Yes
— Parameter change by master	No
— Modbus TCP Security Protocol	No
Address space per station	
— Address space per station, max.	300 byte
— Access-consistent address space	2 byte
Updating time	
— I/O request interval	2 ms
Connections	
— number of connections per device	12
Open IE communication	
● TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
● SNMP	Yes
● LLDP	Yes
● ARP	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes
Alarms	

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● Diagnostic alarm	Yes; Parameterizable
● Maintenance interrupt	Yes; Parameterizable
● Hardware interrupt	Yes; Parameterizable
Diagnoses	
● Diagnostic information readable	Yes
● Monitoring the supply voltage	Yes
— parameterizable	Yes
● Wire break	Yes; DI, input current < 0.3 mA, per channel
● Short-circuit encoder supply	Yes; Per channel
Diagnostics indication LED	
● RUN LED	Yes; green LED
● ERROR LED	Yes; red LED
● MAINT LED	Yes; Yellow LED
● Monitoring of the supply voltage (PWR-LED)	Yes; green LED
● NS LED	Yes; green/red LED
● MS LED	Yes; green/red LED
● IO LED	Yes; red-green-yellow LED
● Channel status display	Yes; green LED
● for channel diagnostics	Yes; red LED
● For load voltage monitoring	Yes; green LED
● Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
● between the channels	Yes
● between the channels and the power supply of the electronics	8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Isolation	
tested with	
● 24 V DC circuits	707 V DC (type test)
● Test voltage for interface, rms value [Vrms]	1 500 V; According to IEEE 802.3
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
● Performance level according to ISO 13849-1	PL d
● Category according to ISO 13849-1	Cat. 3
● SIL acc. to IEC 62061	SIL 2
● remark on safety-oriented shutdown	https://support.industry.siemens.com/cs/de/en/view/39198632
Use in hazardous areas	
● Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2
● Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22
Security	
signed firmware update	Yes
securely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
● min.	-40 °C
● max.	60 °C
Altitude during operation relating to sea level	
● Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	
Width	45 mm

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Height	200 mm
Depth	48 mm

Weights

Weight, approx.	780 g

Classifications

	Version	Classification
eClass	16	27-24-26-08
eClass	14	27-24-26-08
eClass	12	27-24-26-08
eClass	9.1	27-24-26-08
eClass	9	27-24-26-08
eClass	8	27-24-26-08
eClass	7.1	27-24-26-08
eClass	6	27-24-26-08
ETIM	10	EC001604
ETIM	9	EC001604
ETIM	8	EC001604
ETIM	7	EC001604

Approvals / Certificates

General Product Approval

Manufacturer Declaration

Miscellaneous

General Product Approval

China RoHS

For use in hazardous locations

CCC-Ex

Miscellaneous

For use in hazardous locations

CCC-Ex

Maritime application

Maritime application

CCS (China Classification Society)

KR (Korean Register of Shipping)

other

Food, Pharmaceutical, Medical

Confirmation

Environment

Environment

Industrial Communication

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