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## Data sheet 6ES7148-6JE00-0BB0



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 |
| ● 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 V2.3.x |
| ● Multi Fieldbus Configuration Tool (MFCT) | V1.4.1 or higher |
| Operating mode | |
| ● DI | Yes |
| ● Counter | No |
| ● 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; encoder power supply outputs applied with reversed polarity |
| 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** | |
| 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** | |


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|---|---|
| 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 |
| Source/sink 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 |
| 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 |
| 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 |


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| 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 function block IO_LINK_MASTER |
| 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** | |
| 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 |
| **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 |
| PROFINET IO Device | |
| Services | |
| — IRT | Yes; 250 µs to 4 ms in 125 µs frame |


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| — Prioritized startup | Yes |
| — Shared device | Yes |
| — Number of IO Controllers with shared device, max. | 2 |
| 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 |
| 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 slave | 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 | |
| ● 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 |


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| ● 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 |
| **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 |
| Height | 200 mm |
| Depth | 48 mm |
| **Weights** | |
| Weight, approx. | 780 g |

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