SIEMENS

## Data sheet 6ES7146-6FF00-0AB0



SIMATIC DP, ET 200eco PN, F-DI 8x24 V /F-DQ 3x24 V 2 A, M12 PROFIsafe, up to PL e (ISO 13849), up to SIL 3 (IEC 61508), degree of protection IP65/67, including eCoding plug-in connector

| | |
|---|---|
| **General information** | |
| HW functional status | from FS01 |
| Firmware version | V1.0.0 |
| ● FW update possible | Yes |
| Vendor identification (VendorID) | 02AH |
| Device identifier (DeviceID) | 0306H |
| Product function | |
| ● I&M data | Yes |
| ● Isochronous mode | No |
| ● IRT | No; module will participate within an IRT topology |
| ● Fast startup | No |
| ● Prioritized startup | No |
| Engineering with | |
| ● STEP 7 TIA Portal configurable/integrated from version | V15 with HSP 204 |
| ● PROFINET from GSD version/GSD revision | GSDML V2.34 |
| Operating mode | |
| ● DI | Yes |
| ● DQ | Yes |
| **Supply voltage** | |
| Rated value (DC) | 24 V |
| Reverse polarity protection | Yes |
| power supply according to NEC Class 2 required | Yes |
| 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 |
| 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 |
| **Input current** | |
| Current consumption, typ. | 200 mA |
| from supply voltage 1L+, max. | 4 A |
| from load voltage 2L+, max. | 4 A |
| **Encoder supply** | |
| Number of outputs | 2; Vs |
| 24 V encoder supply | |


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| | |
|---|---|
| ● Short-circuit protection | Yes; electronic (response threshold 1.4 A to 4.5 A) |
| ● Output current, max. | 800 mA; per output |
| **Power loss** | |
| Power loss, typ. | 9 W |
| **Address area** | |
| Address space per module | |
| ● Inputs | 8 byte |
| ● Outputs | 6 byte |
| **Digital inputs** | |
| Number of digital inputs | 8; 8 (one-channel); 4 (two-channel) |
| Digital inputs, parameterizable | Yes |
| Input characteristic curve in accordance with IEC 61131, type 1 | 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" | -30 V DC to +5 V DC |
| ● for signal "1" | 15 V DC to 30 V DC |
| Input delay (for rated value of input voltage) | |
| for standard inputs | |
| — parameterizable | Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms |
| Cable length | |
| ● unshielded, max. | 30 m |
| **Digital outputs** | |
| Number of digital outputs | 3 |
| ● in groups of | 3 |
| Short-circuit protection | Yes; Electronic |
| ● Response threshold, typ. | 10 A |
| Limitation of inductive shutdown voltage to | PM-switching: Typ. -26 V to (-48 V) |
| Controlling a digital input | No |
| Switching capacity of the outputs | |
| ● on lamp load, max. | 10 W |
| Output current | |
| ● for signal "1" rated value | 2 A |
| ● for signal "1" permissible range, max. | 2.4 A |
| ● for signal "0" residual current, max. | 0.5 mA |
| Parallel switching of two outputs | |
| ● for uprating | No |
| ● for redundant control of a load | No |
| Switching frequency | |
| ● with resistive load, max. | 30 Hz |
| ● with inductive load, max. | 0.1 Hz |
| ● on lamp load, max. | 10 Hz |
| Total current of the outputs (per group) | |
| all mounting positions | |
| — up to 60 °C, max. | 3.9 A |
| Cable length | |
| ● unshielded, max. | 30 m |
| **Encoder** | |
| Connectable encoders | |
| ● 2-wire sensor | No |
| — permissible quiescent current (2-wire sensor), max. | 0.5 mA |
| **Interfaces** | |
| Transmission procedure | 100BASE-TX |
| Number of PROFINET interfaces | 1 |
| **1. Interface** | |
| Interface types | |


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| | |
|---|---|
| ● M12 port | Yes |
| ● integrated switch | Yes |
| Protocols | |
| ● PROFINET IO Device | Yes |
| ● Open IE communication | No |
| PROFINET IO Device | |
| Services | |
| — IRT | No; module will participate within an IRT topology |
| — Prioritized startup | No |
| — Shared device | No |
| **Interface types** | |
| M12 port | |
| ● Autonegotiation | Yes |
| ● Autocrossing | Yes |
| ● Transmission rate, max. | 100 Mbit/s |
| **Protocols** | |
| Supports protocol for PROFINET IO | Yes |
| PROFINET CBA | No |
| PROFIsafe | Yes |
| EtherNet/IP | No |
| Modbus TCP | No |
| Redundancy mode | |
| ● PROFINET system redundancy (S2) | Yes |
| ● PROFINET system redundancy (R1) | No |
| ● H-Sync forwarding | No |
| Media redundancy | |
| — MRP | Yes |
| — MRPD | No |
| Open IE communication | |
| ● TCP/IP | No |
| ● SNMP | Yes |
| ● DCP | Yes |
| ● LLDP | Yes |
| ● ping | Yes |
| ● ARP | Yes |
| **Interrupts/diagnostics/status information** | |
| Diagnostics function | Yes |
| Alarms | |
| ● Diagnostic alarm | Yes |
| Diagnoses | |
| ● Diagnostic information readable | Yes |
| ● Monitoring the supply voltage | Yes; green "ON" LED |
| ● Wire-break in actuator cable | Yes |
| ● Wire-break in signal transmitter cable | Yes |
| ● short-circuit | Yes |
| ● Short-circuit encoder supply | Yes |
| ● Group error | Yes; Red/yellow "SF/MT" LED |
| **Potential separation** | |
| between the load voltages | Yes |
| between load voltage and all other switching components | No |
| between Ethernet and electronics | Yes |
| Potential separation channels | |
| ● between the channels | No |
| **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 |


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| | |
|---|---|
| **Standards, approvals, certificates** | |
| Suitable for safety-related tripping of standard modules | No |
| Highest safety class achievable in safety mode | |
| ● Performance level according to ISO 13849-1 | PLe |
| ● SIL acc. to IEC 61508 | SIL 2 (single-channel), SIL 3 (two-channel) |
| ● SILCL according to IEC 62061 | SIL 3 |
| Probability of failure (for service life of 20 years and repair time of 100 hours) | |
| — Low demand mode: PFDavg in accordance with SIL2 | < 6.00E-04, 1oo1 evaluation |
| — Low demand mode: PFDavg in accordance with SIL3 | < 1.00E-05, 1oo2 evaluation |
| — High demand/continuous mode: PFH in accordance with SIL2 | < 1.00E-08 1/h, 1oo1 evaluation |
| — High demand/continuous mode: PFH in accordance with SIL3 | < 2.00E-10 1/h, 1oo2 evaluation |
| Probability of failure of the digital outputs (for service life of 20 years and repair time of 100 hours) | |
| — Low demand mode: PFDavg in accordance with SIL3 | < 2.00E-05 |
| — High demand/continuous mode: PFH in accordance with SIL3 | < 7.00E-09 1/h |
| **Ambient conditions** | |
| Ambient temperature during operation | |
| ● min. | -25 °C |
| ● max. | 60 °C |
| **Connection method** | |
| Design of electrical connection | 4/5-pin M12 circular connectors |
| **Dimensions** | |
| Width | 60 mm |
| Height | 175 mm |
| Depth | 49 mm |
| **Weights** | |
| Weight, approx. | 940 g |

**Classifications**

| | Version | Classification |
|---|---|---|
| eClass | 16 | 27-24-26-04 |
| eClass | 14 | 27-24-26-04 |
| eClass | 12 | 27-24-26-04 |
| eClass | 9.1 | 27-24-26-04 |
| eClass | 9 | 27-24-26-04 |
| eClass | 8 | 27-24-26-04 |
| eClass | 7.1 | 27-24-26-04 |
| eClass | 6 | 27-24-26-04 |
| ETIM | 10 | EC001599 |
| ETIM | 9 | EC001599 |
| ETIM | 8 | EC001599 |
| ETIM | 7 | EC001599 |
| IDEA | 4 | 3566 |
| UNSPSC | 15 | 32-15-17-05 |

**Approvals / Certificates**

**General Product Approval**

China RoHS

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