




SIMATIC DP, ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12, PROFIsafe, up to PL e (ISO 13849), Up to SIL 3 (IEC 61508), Degree of protection IP67

| General information | |
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| Product type designation | F-DI 4+F-DQ 2x24VDC/2A, 4xM12 |
| HW functional status | FS01 |
| Firmware version | V1.0.x |
| Product function | |
| • I&M data | Yes; I&M0 to I&M3 |
| Engineering with | |
| • STEP 7 TIA Portal configurable/integrated from version | STEP 7 V17 or higher |
| Operating mode | |
| • DI | Yes |
| • DQ | Yes |
| Supply voltage | |
| Rated value (DC) | 24 V |
| 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; outputs applied with reversed polarity for loads connected between M-switch and 2L+ will conduct |
| Input current | |
| Current consumption (rated value) | 55 mA (1L+) / 40 mA (2L+); without load |
| from load voltage 1L+ (unswitched voltage) | 4 A; Maximum value |
| from load voltage 2L+, max. | 4 A; Maximum value |
| Encoder supply | |
| Number of outputs | 2 |
| 24 V encoder supply | |
| • Short-circuit protection | Yes; per load voltage, electronic (response threshold 0.7 A to 1.7 A) |
| • Output current, max. | 1 A; total current of all encoders, max. 0.5 A per load voltage; maximum of 2.0 V drop |
| Power loss | |
| Power loss, typ. | 4.7 W |
| Address area | |
| Address space per module | |
| • Inputs | 8 byte |

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| • Outputs | 6 byte |
| Digital inputs | |
| Number of digital inputs | 4 |
| Input characteristic according to IEC 61131 | Type 1 |
| Number of simultaneously controllable inputs | |
| all mounting positions | |
| — up to 55 °C, max. | 4 |
| Input voltage | |
| • Rated value (DC) | 24 V |
| • for signal "0" | -30 to +5 V |
| • for signal "1" | +15 to +30 V |
| Input current | |
| • for signal "1", typ. | 4.85 mA |
| Input delay (for rated value of input voltage) | |
| for standard inputs | |
| — parameterizable | Yes |
| — at "0" to "1", min. | 0.8 ms |
| — at "0" to "1", max. | 12.8 ms |
| — at "1" to "0", min. | 0.8 ms |
| — at "1" to "0", max. | 12.8 ms |
| Cable length | |
| • unshielded, max. | 30 m |
| Digital outputs | |
| Number of digital outputs | 2 |
| • in groups of | 2 |
| Short-circuit protection | Yes; per channel, electronic |
| • Response threshold, typ. | 10 A; measured at M-switch, threshold for P-switch is higher |
| Open-circuit detection | Yes; per channel, only detects when output is off |
| Overload protection | Yes |
| • Response threshold, typ. | 3.4 A; measured at P-switch |
| Limitation of inductive shutdown voltage to | P-switch: -26 V DC referenced to 2M, M-switch: +48 V DC referenced to 2M |
| Switching capacity of the outputs | |
| • on lamp load, max. | 10 W |
| Load resistance range | |
| • lower limit | 12 Ω |
| • upper limit | 2 kΩ |
| Output voltage | |
| • for signal "1", min. | L+ (-2.0 V), P-switch is L+ (-1.5 V), M-switch is 0.5 V |
| Output current | |
| • for signal "1" rated value | 2 A |
| • for signal "0" residual current, max. | 0.5 mA |
| 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 | |
| • Current per group, max. | 4 A |
| Cable length | |
| • unshielded, max. | 30 m |
| Encoder | |
| Connectable encoders | |
| • 2-wire sensor | No |
| — permissible quiescent current (2-wire sensor), max. | 0.5 mA |
| Interrupts/diagnostics/status information | |
| Substitute values connectable | No |
| Alarms | |
| • Diagnostic alarm | Yes; Parameterizable |
| Diagnoses | |
| • Monitoring the supply voltage | Yes |
| • Wire-break | Yes; outputs when off |

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| • Short-circuit | Yes; inputs, outputs, encoder supply |
| Diagnostics indication LED | |
| • Channel status display | Yes; green LED |
| • for channel diagnostics | Yes; red LED |
| • for module diagnostics | Yes; green/red LED |
| • For load voltage monitoring | Yes; green LED |
| Potential separation | |
| between the load voltages | Yes |
| Potential separation channels | |
| • between the channels, in groups of | 4 DI channels are isolated from 2 DQ channels |
| • between the channels and backplane bus | Yes |
| • between the channels and the power supply of the electronics | DI channels are non-isolated from supply voltage 1L+ and DQ channels are isolated from the supply voltage 1L+ |
| Isolation | |
| Isolation tested with | 707 V DC (type test) |
| Degree and class of protection | |
| IP degree of protection | IP65/67 |
| Standards, approvals, certificates | |
| Highest safety class achievable in safety mode | |
| • Performance level according to ISO 13849-1 | PLd (DI single-channel), PLe (DI two-channel, DQ) |
| • Category according to ISO 13849-1 | Cat. 3 (DI single-channel), Cat. 4 (DI two-channel, DQ) |
| • SIL acc. to IEC 61508 | SIL 2 (DI single-channel), SIL 3 (DI two-channel, DQ) |
| Probability of failure (for service life of 20 years and repair time of 100 hours) | |
| — Low demand mode: PFDavg in accordance with SIL2 | < 1.00E-03 DI single-channel; < 1.00E-03 DQ with dark test disabled |
| — Low demand mode: PFDavg in accordance with SIL3 | < 1.00E-05 DI two-channel; < 2.00E-05 DQ with dark test enabled |
| — High demand/continuous mode: PFH in accordance with SIL2 | < 1.00E-08 1/h DI single-channel; < 1.00E-07 1/h DQ with dark test disabled |
| — High demand/continuous mode: PFH in accordance with SIL3 | < 1.00E-09 1/h DI two-channel; < 1.00E-08 1/h DQ with dark test enabled |
| Ambient conditions | |
| Ambient temperature during operation | |
| • min. | -30 °C |
| • max. | 55 °C |
| connection method | |
| Design of electrical connection for the inputs and outputs | M12, 5-pole |
| Design of electrical connection for supply voltage | M8, 4-pin |
| ET-Connection | |
| • ET-Connection | M8, 4-pin, shielded |
| Dimensions | |
| Width | 45 mm |
| Height | 159 mm |
| Depth | 40 mm |
| Weights | |
| Weight, approx. | 220 g |
| last modified: | 6/8/2022  |