



SIMATIC S7-1500, F digital output module, F-DQ 8x 24 V DC 2A PPM PROFIsafe; 35 mm width; up to PL E (ISO 13849-1)/ SIL3 (IEC 61508)

| General information                                      |                                 |
|----------------------------------------------------------|---------------------------------|
| Product type designation                                 | F-DQ 8x24VDC/2A PPM             |
| Firmware version                                         |                                 |
| • FW update possible                                     | Yes                             |
| Product function                                         |                                 |
| • I&M data                                               | Yes; I&M0 to I&M3               |
| Engineering with                                         |                                 |
| • STEP 7 TIA Portal configurable/integrated from version | V13 SP1 with HSP 0086           |
| Operating mode                                           |                                 |
| • DQ                                                     | Yes                             |
| • MSO                                                    | No                              |
| Supply voltage                                           |                                 |
| Rated value (DC)                                         | 24 V                            |
| permissible range, lower limit (DC)                      | 19.2 V                          |
| permissible range, upper limit (DC)                      | 28.8 V                          |
| Reverse polarity protection                              | Yes                             |
| power supply according to NEC Class 2 required           | No                              |
| Input current                                            |                                 |
| Current consumption (rated value)                        | 110 mA; without load            |
| Current consumption, max.                                | 130 mA; without load            |
| output voltage / header                                  |                                 |
| Rated value (DC)                                         | 24 V                            |
| Power                                                    |                                 |
| Power available from the backplane bus                   | 0.8 W                           |
| Power loss                                               |                                 |
| Power loss, typ.                                         | 11 W                            |
| Address area                                             |                                 |
| Address space per module                                 |                                 |
| • Inputs                                                 | 6 byte; S7-300/400F CPU, 5 byte |
| • Outputs                                                | 6 byte; S7-300/400F CPU, 5 byte |
| Hardware configuration                                   |                                 |
| Automatic encoding                                       | Yes                             |
| • Electronic coding element type F                       | Yes                             |
| Digital outputs                                          |                                 |
| Number of digital outputs                                | 8                               |
| Current-sinking                                          | Yes                             |
| Current-sourcing                                         | Yes                             |
| Short-circuit protection                                 | Yes                             |
| Open-circuit detection                                   | Yes                             |
| • Response threshold, typ.                               | 8 mA                            |

|                                                                                    |                                                                                                             |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Overload protection                                                                | Yes                                                                                                         |
| • Response threshold, typ.                                                         | 2.9 A                                                                                                       |
| Limitation of inductive shutdown voltage to                                        | PM-switching: -24 V + (-47 V), PP-switching: -24 V                                                          |
| Controlling a digital input                                                        | Yes; digital output, according to IEC 61131-2, type 2                                                       |
| Switching capacity of the outputs                                                  |                                                                                                             |
| • with resistive load, max.                                                        | 2 A                                                                                                         |
| • on lamp load, max.                                                               | 10 W                                                                                                        |
| Load resistance range                                                              |                                                                                                             |
| • lower limit                                                                      | 12 $\Omega$                                                                                                 |
| • upper limit                                                                      | 2 000 $\Omega$                                                                                              |
| Output voltage                                                                     |                                                                                                             |
| • for signal "1", min.                                                             | 24 V; L+ (-0.5 V)                                                                                           |
| Output current                                                                     |                                                                                                             |
| • for signal "1" rated value                                                       | 2 A                                                                                                         |
| • for signal "0" residual current, max.                                            | 0.5 mA; Current-sourcing, or current sourcing and sinking switches individually, current sinking: max. 1 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 channel, max.                                                        | 2 A                                                                                                         |
| Total current of the outputs (per module)                                          |                                                                                                             |
| horizontal installation                                                            |                                                                                                             |
| — up to 40 °C, max.                                                                | 16 A                                                                                                        |
| — up to 60 °C, max.                                                                | 8 A                                                                                                         |
| vertical installation                                                              |                                                                                                             |
| — up to 40 °C, max.                                                                | 8 A                                                                                                         |
| Cable length                                                                       |                                                                                                             |
| • shielded, max.                                                                   | 1 000 m                                                                                                     |
| • unshielded, max.                                                                 | 500 m                                                                                                       |
| Interrupts/diagnostics/status information                                          |                                                                                                             |
| Diagnostics function                                                               | Yes                                                                                                         |
| Substitute values connectable                                                      | No                                                                                                          |
| Alarms                                                                             |                                                                                                             |
| • Diagnostic alarm                                                                 | Yes                                                                                                         |
| Diagnoses                                                                          |                                                                                                             |
| • Monitoring the supply voltage                                                    | Yes                                                                                                         |
| • Wire-break                                                                       | Yes                                                                                                         |
| • Short-circuit                                                                    | Yes                                                                                                         |
| • Group error                                                                      | Yes                                                                                                         |
| Diagnostics indication LED                                                         |                                                                                                             |
| • RUN LED                                                                          | Yes; green LED                                                                                              |
| • ERROR LED                                                                        | Yes; red LED                                                                                                |
| • Monitoring of the supply voltage (PWR-LED)                                       | Yes                                                                                                         |
| • Channel status display                                                           | Yes; green LED                                                                                              |
| • for channel diagnostics                                                          | Yes; red LED                                                                                                |
| • for module diagnostics                                                           | Yes; red LED                                                                                                |
| Potential separation                                                               |                                                                                                             |
| Potential separation channels                                                      |                                                                                                             |
| • between the channels                                                             | No                                                                                                          |
| • between the channels and backplane bus                                           | Yes                                                                                                         |
| Isolation                                                                          |                                                                                                             |
| Isolation tested with                                                              | 707 V DC (type test)                                                                                        |
| Standards, approvals, certificates                                                 |                                                                                                             |
| Suitable for safety functions                                                      | Yes                                                                                                         |
| Highest safety class achievable in safety mode                                     |                                                                                                             |
| • Performance level according to ISO 13849-1                                       | PLe                                                                                                         |
| • SIL acc. to IEC 61508                                                            | SIL 3                                                                                                       |
| Probability of failure (for service life of 20 years and repair time of 100 hours) |                                                                                                             |
| — Low demand mode: PFDavg in accordance with                                       | < 6.00E-05                                                                                                  |

|                                                            |                |
|------------------------------------------------------------|----------------|
| SIL3                                                       |                |
| — High demand/continuous mode: PFH in accordance with SIL3 | < 2.00E-09 1/h |

Ambient conditions

|                                      |       |
|--------------------------------------|-------|
| Ambient temperature during operation |       |
| • horizontal installation, min.      | 0 °C  |
| • horizontal installation, max.      | 60 °C |
| • vertical installation, min.        | 0 °C  |
| • vertical installation, max.        | 40 °C |

Dimensions

|        |        |
|--------|--------|
| Width  | 35 mm  |
| Height | 147 mm |
| Depth  | 129 mm |

Weights

|                 |       |
|-----------------|-------|
| Weight, approx. | 300 g |
|-----------------|-------|

last modified:

8/7/2023 