



SIMATIC S7-1500, F digital input module, F-DI 16x 24 V DC PROFIsafe; 35 mm width; up to PL E (ISO 13849-1)/ SIL 3 (IEC 61508)

| General information                                      |                                                     |
|----------------------------------------------------------|-----------------------------------------------------|
| Product type designation                                 | F-DI 16x24VDC                                       |
| 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                                           |                                                     |
| • DI                                                     | Yes                                                 |
| • MSI                                                    | 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)                        | 50 mA; without load                                 |
| Current consumption, max.                                | 60 mA; without load                                 |
| Encoder supply                                           |                                                     |
| Number of outputs                                        | 4                                                   |
| Short-circuit protection                                 | Yes; Electronic (response threshold 0.7 A to 1.8 A) |
| 24 V encoder supply                                      |                                                     |
| • 24 V                                                   | Yes; min. L+ (-1.5 V)                               |
| • Short-circuit protection                               | Yes                                                 |
| • Output current, max.                                   | 300 mA; Max. 100 mA when mounted vertically         |
| Power                                                    |                                                     |
| Power consumption from the backplane bus                 | 0.9 W                                               |
| Power loss                                               |                                                     |
| Power loss, typ.                                         | 4.6 W                                               |
| Address area                                             |                                                     |
| Address space per module                                 |                                                     |
| • Inputs                                                 | 9 byte; S7-300/400F CPU, 8 byte                     |
| • Outputs                                                | 5 byte; S7-300/400F CPU, 4 byte                     |
| Hardware configuration                                   |                                                     |
| Automatic encoding                                       | Yes                                                 |
| • Electronic coding element type F                       | Yes                                                 |

|                                                                                           |                      |
|-------------------------------------------------------------------------------------------|----------------------|
| <b>Digital inputs</b>                                                                     |                      |
| Number of digital inputs                                                                  | 16                   |
| Sourcing/sinking input                                                                    | Yes; P-reading       |
| Input characteristic curve in accordance with IEC 61131, type 1                           | Yes                  |
| <b>Input voltage</b>                                                                      |                      |
| • Rated value (DC)                                                                        | 24 V                 |
| • for signal "0"                                                                          | -30 to +5 V          |
| • for signal "1"                                                                          | +15 to +30 V         |
| <b>Input current</b>                                                                      |                      |
| • for signal "1", typ.                                                                    | 3.7 mA               |
| <b>Input delay (for rated value of input voltage)</b>                                     |                      |
| for standard inputs                                                                       |                      |
| — parameterizable                                                                         | Yes                  |
| — at "0" to "1", min.                                                                     | 0.4 ms               |
| — at "0" to "1", max.                                                                     | 20 ms                |
| — at "1" to "0", min.                                                                     | 0.4 ms               |
| — at "1" to "0", max.                                                                     | 20 ms                |
| <b>Cable length</b>                                                                       |                      |
| • shielded, max.                                                                          | 1 000 m              |
| • unshielded, max.                                                                        | 500 m                |
| <b>Interrupts/diagnostics/status information</b>                                          |                      |
| Diagnostics function                                                                      | Yes                  |
| <b>Alarms</b>                                                                             |                      |
| • Diagnostic alarm                                                                        | Yes                  |
| • Hardware interrupt                                                                      | No                   |
| <b>Diagnoses</b>                                                                          |                      |
| • Monitoring the supply voltage                                                           | Yes                  |
| • Wire break                                                                              | No                   |
| • Short-circuit                                                                           | Yes                  |
| • Group error                                                                             | Yes                  |
| <b>Diagnostics indication LED</b>                                                         |                      |
| • RUN LED                                                                                 | Yes; green LED       |
| • ERROR LED                                                                               | Yes; red LED         |
| • Channel status display                                                                  | Yes; green LED       |
| • for channel diagnostics                                                                 | Yes; red LED         |
| • for module diagnostics                                                                  | Yes; red LED         |
| <b>Potential separation</b>                                                               |                      |
| <b>Potential separation channels</b>                                                      |                      |
| • between the channels and backplane bus                                                  | Yes                  |
| <b>Isolation</b>                                                                          |                      |
| Isolation tested with                                                                     | 707 V DC (type test) |
| <b>Standards, approvals, certificates</b>                                                 |                      |
| Suitable for safety functions                                                             | Yes                  |
| <b>Highest safety class achievable in safety mode</b>                                     |                      |
| • Performance level according to ISO 13849-1                                              | PLe                  |
| • SIL acc. to IEC 61508                                                                   | SIL 3                |
| <b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> |                      |
| — Low demand mode: PFDavg in accordance with SIL3                                         | < 5.00E-05           |
| — High demand/continuous mode: PFH in accordance with SIL3                                | < 1.00E-09 1/h       |
| <b>Ambient conditions</b>                                                                 |                      |
| <b>Ambient temperature during operation</b>                                               |                      |
| • horizontal installation, min.                                                           | 0 °C                 |
| • horizontal installation, max.                                                           | 60 °C                |
| • vertical installation, min.                                                             | 0 °C                 |
| • vertical installation, max.                                                             | 40 °C                |
| <b>Dimensions</b>                                                                         |                      |
| Width                                                                                     | 35 mm                |

|                        |        |
|------------------------|--------|
| Height                 | 147 mm |
| Depth                  | 129 mm |
| <b>Weights</b>         |        |
| Weight, approx.        | 280 g  |
| <b>Classifications</b> |        |

|        | Version | Classification |
|--------|---------|----------------|
| eClass | 14      | 27-24-22-04    |
| eClass | 12      | 27-24-22-04    |
| eClass | 9.1     | 27-24-22-04    |
| eClass | 9       | 27-24-22-04    |
| eClass | 8       | 27-24-22-04    |
| eClass | 7.1     | 27-24-22-04    |
| eClass | 6       | 27-24-22-04    |
| ETIM   | 10      | EC001419       |
| ETIM   | 9       | EC001419       |
| ETIM   | 8       | EC001419       |
| ETIM   | 7       | EC001419       |
| IDEA   | 4       | 3566           |
| UNSPSC | 15      | 32-15-17-05    |

#### Approvals / Certificates

##### General Product Approval

[Miscellaneous](#)



[China RoHS](#)



|                          |     |                                |
|--------------------------|-----|--------------------------------|
| General Product Approval | EMV | For use in hazardous locations |
|--------------------------|-----|--------------------------------|



[FM](#)

[CCC-Ex](#)



|                                |                   |
|--------------------------------|-------------------|
| For use in hazardous locations | Functional Safety |
|--------------------------------|-------------------|

[Type Examination Certificate](#)



[Miscellaneous](#)

[CCC-Ex](#)

[Type Examination Certificate](#)

[TUEV](#)

##### Maritime application



[NK / Nippon Kaiji Kyokai](#)



|                      |                          |
|----------------------|--------------------------|
| Maritime application | Industrial Communication |
|----------------------|--------------------------|

[CCS \(China Classification Society\)](#)

[KR \(Korean Register of Shipping\)](#)

[PROFIsafe](#)

last modified:

10/23/2025

