

SIPLUS S7-1500 F DI 16X24VDC HF T1 RAIL -25 ... +55°C T1 (70°C for 10 min) with conformal coating based on 6ES7526-1BH00-0AB0 . FAILSAFE DIGITAL INPUT MODULE, F-DI "16X24VDC PROFISAFE; 35 MM" "WIDTH; UP TO PL E (ISO" 13849-1)/ SIL3 (IEC 61508)



Figure similar

| General information                 |                                                     |
|-------------------------------------|-----------------------------------------------------|
| Product type designation            | F-DI 16x24VDC                                       |
| Product function                    |                                                     |
| • I&M data                          | Yes; I&M0 to I&M3                                   |
| Operating mode                      |                                                     |
| • DI                                | Yes                                                 |
| 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                                                 |
| Input current                       |                                                     |
| Current consumption (rated value)   | 50 mA                                               |
| 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 available from the backplane bus                          | 0.9 W                                       |
| Power loss                                                      |                                             |
| Power loss, typ.                                                | 4.6 W                                       |
| Address area                                                    |                                             |
| Address space per module                                        |                                             |
| • Address space per module, max.                                | 9 byte                                      |
| Hardware configuration                                          |                                             |
| Automatic encoding                                              | Yes                                         |
| • Electronic coding element type F                              | Yes                                         |
| Digital inputs                                                  |                                             |
| Number of digital inputs                                        | 16                                          |
| Source/sink input                                               | Yes; P-reading                              |
| Input characteristic curve in accordance with IEC 61131, type 1 | Yes                                         |
| 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.                                          | 3.7 mA                                      |
| Input delay (for rated value of input voltage)                  |                                             |
| 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                                       |
| Cable length                                                    |                                             |
| • shielded, max.                                                | 1 000 m                                     |
| • unshielded, max.                                              | 500 m                                       |
| Interrupts/diagnostics/status information                       |                                             |
| Diagnostics function                                            | Yes                                         |
| Alarms                                                          |                                             |
| • Diagnostic alarm                                              | Yes                                         |
| • Hardware interrupt                                            | No                                          |

|                                                                                           |                                                                                                                                                              |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Diagnostic messages</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>Permissible potential difference</b>                                                   |                                                                                                                                                              |
| between different circuits                                                                | 75 V DC/60 V AC (base isolation)                                                                                                                             |
| <b>Isolation</b>                                                                          |                                                                                                                                                              |
| Isolation tested with                                                                     | 707 V DC (type test) and according to EN 50155 (routine 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                                              | PL <sub>e</sub>                                                                                                                                              |
| • SIL acc. to IEC 61508                                                                   | SIL 3                                                                                                                                                        |
| • SIL in accordance with EN 50126, 50128, 50129                                           | SIL 2; a higher safety integrity level is possible if tested and approved for the specific application under consideration of all local regulations.         |
| <b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b> |                                                                                                                                                              |
| — Low demand mode: PFD <sub>avg</sub> in accordance with SIL3                             | < 5.00E-05                                                                                                                                                   |
| — High demand/continuous mode: PFH in accordance with SIL3                                | < 1.00E-09 1/h                                                                                                                                               |
| <b>Railway application</b>                                                                |                                                                                                                                                              |
| • EN 50121-3-2                                                                            | Yes; EMC for rail vehicles                                                                                                                                   |
| • EN 50121-4                                                                              | Yes; EMC for signal and telecommunications systems                                                                                                           |
| • EN 50124-1                                                                              | Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC                                  |
| • EN 50125-1                                                                              | Yes; Rail vehicles - see ambient conditions                                                                                                                  |
| • EN 50125-2                                                                              | Yes; Stationary electrical equipment - see ambient conditions                                                                                                |
| • EN 50125-3                                                                              | Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track) |

- EN 50155
- EN 61373
- Fire protection acc. to EN 45545-2

Yes; Rail vehicles - temperature class T1, horizontal mounting position, salt spray Class ST2

Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B

Yes; Rail vehicles - verification on request

## Ambient conditions

### Ambient temperature during operation

- horizontal installation, min. -25 °C; = Tmin
- horizontal installation, max. 60 °C; = Tmax; +70 °C for 10 min (T1 acc. to EN 50155)

### Altitude during operation relating to sea level

- Installation altitude above sea level, max. 2 000 m
- Ambient air temperature-barometric pressure-altitude Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)

### Relative humidity

- With condensation, tested in accordance with IEC 60068-2-38, max. 100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

### Resistance

#### Coolants and lubricants

- Resistant to commercially available coolants and lubricants Yes; Incl. diesel and oil droplets in the air

#### Use in stationary industrial systems

- to biologically active substances according to EN 60721-3-3 Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3 Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); \*
- to mechanically active substances according to EN 60721-3-3 Yes; Class 3S4 incl. sand, dust, \*

#### Use on land craft, rail vehicles and special-purpose vehicles

- to biologically active substances according to EN 60721-3-5 Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5 Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); \*
- to mechanically active substances according to EN 60721-3-5 Yes; Class 5S3 incl. sand, dust; \*

#### Usage in industrial process technology

- Against chemically active substances acc. to EN 60654-4 Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04 Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)

### Remark

- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 \* The supplied plug covers must remain in place over the unused interfaces during operation!

### Conformal coating

- Coatings for printed circuit board assemblies acc. to EN 61086
- Protection against fouling acc. to EN 60664-3
- Electronic equipment on rolling stock acc. to EN 50155
- Military testing according to MIL-I-46058C, Amendment 7
- Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A

Yes; Class 2 for high reliability

Yes; Type 1 protection

Yes; Class PC2 protective coating acc. to EN 50155:2017

Yes; Discoloration of coating possible during service life

Yes; Conformal coating, Class A

## Dimensions

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

## Weights

|                 |       |
|-----------------|-------|
| Weight, approx. | 280 g |
|-----------------|-------|

## Other

|       |                                                                                                                                           |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Note: | For use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A Online Support article 109736776 |
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