Data sheet

SIPLUS S7-1500 F-DI 16x24VDC -25 ... +60°C 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)



| 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 |
| 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 appeder gupply | |
|--|--|---|
| Short-circuit protection Output current, max. Output current current current, max. Output current curre | 24 V encoder supply | Voc. min 11/45V |
| Output current, max. | | |
| 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 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 Input voltage • Rated value (IDC) 24 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 "1" to "0", min. 0.4 ms — at "1" to "0", min. 0.4 ms — at "1" to "0", max. 20 ms Cable length • shielded, max. 1000 m Diagnostics function Yes Alarms • Diagnostics function Pes Poisgnostic slarm • Diagnostics function Piss • Diagnostics function Piss • Diagnostics function | · | |
| Power loss Pow | Output current, max. | 300 mA; Max. 100 mA when mounted vertically |
| 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 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. Input delay (for rated value of input voltage) for standard inputs — parameterizable Yes — at "0" to "1", max. 20 ms — at "1" to "0", max. 20 ms Cable length • shielded, max. 1000 m Interrupts/diagnostics/status information Diagnostics function Yes Alarms • Diagnostics alarm | Power | |
| Power loss, typ. Address area Address space per module • Address space per module, max. 9 byte Hardware configuration Automatic encoding • Electronic coding element type F Ves Digital inputs Number of digital inputs 50 source/sink input Yes, P-reading Input characteristic curve in accordance with IEC 61131, type 1 Input voltage • Rated value (DC) • for signal "0" • for signal "1" • for signal "1" Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", max. — at "1" to "0", min. — at "0" to "1", max. 20 ms — at "1" to "0", max. 20 ms Cable length • shielded, max. • shielded, max. • Diagnostics function Pes Plagnostic slarm Pes | Power available from the backplane bus | 0.9 W |
| Address space per module Address space per module, max. 9 byte Hardware configuration Automatic encoding Electronic coding element type F Yes Digital inputs Number of digital inputs 16 Source/sink input Input characteristic curve in accordance with IEC 61131, type 1 Input voltage Rated value (DC) for signal "0" for signal "1" for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. Cable length e shielded, max. unshielded, max. 1000 m Interrupts/diagnostics/status information Diagnostics function Ves Page Pa | Power loss | |
| Address space per module Address space per module, max. 9 byte Hardware configuration Automatic encoding Electronic coding element type F Yes Digital inputs Number of digital inputs Source/sink input Input characteristic curve in accordance with IEC 61131, type 1 Input voltage Rated value (DC) for signal "0" 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 - at "0" to "1", max at "0" to "1", max at "1" to "0", min at "1" to "0", max. 20 ms Cable length shielded, max. unshielded, max. 1000 m Interrupts/diagnostics/status information Diagnostics function Pes | Power loss, typ. | 4.6 W |
| Address space per module, max. Pardware configuration Automatic encoding Electronic coding element type F Pes Pes Pigital inputs Number of digital inputs Number of digital inputs Number of digital inputs 16 Source/sink input Pes Pes Pereading Input characteristic curve in accordance with IEC of 1131, type 1 Input voltage Rated value (DC) of or signal "0" of or signal "1" of or signal "1" of or signal "1" of or signal "1" of or signal "4", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable of at "0" to "1", min. of at "0" to "1", max. of "1" to "0", min. of "1" to "0", max. of "1" to "0", max. Cable length Interrupts/diagnostics/status information Diagnostics function Pes Pigs Pes Alarms Diagnostic alarm Pes | Address area | |
| Hardware configuration Automatic encoding • Electronic coding element type F Ves Digital inputs Number of digital inputs Input characteristic curve in accordance with IEC 61131, type 1 Input voltage • Rated value (DC) • for signal "0" • for signal "1" • for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", min. — at "1" to "0", max. Cable length • shielded, max. • unshielded, max. • Diagnostic alarm Ves Pigs Perading Yes 16 40 Yes 24 V 40 Yes -30 to +5 V 40 15 to +30 V Input current 9 for signal "1", typ. 3.7 mA 3.7 mA 1.7 mA 1.7 mA 1.7 mA 1.7 mA 1.7 mA 1.7 mB 1. | | |
| Automatic encoding • Electronic coding element type F Pes Pyes Digital inputs Number of digital inputs Source/sink input Input characteristic curve in accordance with IEC 61131, type 1 Input voltage • Rated value (DC) • for signal "0" • for signal "1" +15 to +30 V Input current • for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", min. — at "1" to "0", max. 20 ms Cable length • shielded, max. Interrupts/diagnostics/status information Diagnostic alarm Pes Pes Pes 100 m Pes Alarms • Diagnostic alarm Pes Perading Yes 16 37 44 V Yes 3.7 mA Perading Yes 3.7 mA Input delay (for rated value of input voltage) For standard inputs 24 V -30 to +5 V +15 to +30 V Input current • for signal "1", typ. 3.7 mA Input delay (for rated value of input voltage) For standard inputs -20 mS -30 to +5 V +15 to +30 V Interrupts/diagnostics/status information Pes Alarms • Diagnostic alarm Pes | Address space per module, max. | 9 byte |
| Automatic encoding • Electronic coding element type F Pes Pyes Digital inputs Number of digital inputs Source/sink input Input characteristic curve in accordance with IEC 61131, type 1 Input voltage • Rated value (DC) • for signal "0" • for signal "1" +15 to +30 V Input current • for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", min. — at "1" to "0", max. 20 ms Cable length • shielded, max. Interrupts/diagnostics/status information Diagnostic alarm Pes Pes Pes 100 m Pes Alarms • Diagnostic alarm Pes Perading Yes 16 37 44 V Yes 3.7 mA Perading Yes 3.7 mA Input delay (for rated value of input voltage) For standard inputs 24 V -30 to +5 V +15 to +30 V Input current • for signal "1", typ. 3.7 mA Input delay (for rated value of input voltage) For standard inputs -20 mS -30 to +5 V +15 to +30 V Interrupts/diagnostics/status information Pes Alarms • Diagnostic alarm Pes | Hardware configuration | |
| Digital inputs Number of digital inputs 16 | | Yes |
| Number of digital inputs Source/sink input Yes; P-reading Input characteristic curve in accordance with IEC 61131, type 1 Input voltage Rated value (DC) of or signal "0" of or signal "1" Input cerrent of or signal "1", typ. Input delay (for rated value of input voltage) for standard inputs - parameterizable - at "0" to "1", max. - at "0" to "1", max. 20 ms - at "1" to "0", max. 20 ms Cable length oshielded, max. outputs// information Diagnostics function Nes Pes Alarms objects Diagnostic alarm 1000 m Yes | Electronic coding element type F | Yes |
| Number of digital inputs Source/sink input Yes; P-reading Input characteristic curve in accordance with IEC 61131, type 1 Input voltage Rated value (DC) of or signal "0" of or signal "1" Input cerrent of or signal "1", typ. Input delay (for rated value of input voltage) for standard inputs - parameterizable - at "0" to "1", max. - at "0" to "1", max. 20 ms - at "1" to "0", max. 20 ms Cable length oshielded, max. outputs// information Diagnostics function Nes Pes Alarms objects Diagnostic alarm 1000 m Yes | Digital inputs | |
| Source/sink input Input characteristic curve in accordance with IEC 61131, type 1 Input voltage • Rated value (DC) • for signal "0" • for signal "1" Input current • for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. Cable length • shielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Diagnostics function Yes Yes Alarms • Diagnostic alarm Yes | | 16 |
| Input characteristic curve in accordance with IEC 61131, type 1 Input voltage • Rated value (DC) • for signal "0" • for signal "1" • for signal "1" • for signal "1", typ. Input current • for signal "1", typ. 3.7 mA Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", min. — at "1" to "0", max. Cable length • shielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Ves Alarms • Diagnostic alarm Yes | | Yes; P-reading |
| Input voltage • Rated value (DC) • for signal "0" • for signal "1" • for signal "1" • for signal "1", typ. Input current • for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. 20 ms Cable length • shielded, max. • unshielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Yes Alarms • Diagnostic alarm Yes | <u> </u> | |
| Rated value (DC) for signal "0" for signal "1" for signal "1" | 61131, type 1 | |
| • for signal "0" • for signal "1" • for signal "1" • for signal "1", typ. Input current • for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. 20 ms Cable length • shielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Yes Alarms • Diagnostic alarm Yes | Input voltage | |
| • for signal "1" | Rated value (DC) | 24 V |
| Input current • for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. 20 ms Cable length • shielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Yes Alarms • Diagnostic alarm Yes | ● for signal "0" | -30 to +5 V |
| for signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. — at "1" to "0", max. Cable length • shielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Piagnostic alarm Yes | • for signal "1" | +15 to +30 V |
| 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 | Input current | |
| for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. Cable length • shielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Alarms • Diagnostic alarm Yes | ● for signal "1", typ. | 3.7 mA |
| 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 | Input delay (for rated value of input voltage) | |
| — at "0" to "1", min. — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. 20 ms 0.4 ms — at "1" to "0", min. — at "1" to "0", max. 20 ms Cable length • shielded, max. • unshielded, max. 1 000 m Interrupts/diagnostics/status information Diagnostics function Piagnostic alarm Yes | for standard inputs | |
| — at "0" to "1", max. — at "1" to "0", min. — at "1" to "0", max. 20 ms Cable length • shielded, max. • unshielded, max. Diagnostics function Diagnostic alarm 20 ms 1 000 m 500 m | — parameterizable | Yes |
| - at "1" to "0", min at "1" to "0", max. 20 ms Cable length • shielded, max. • unshielded, max. 1 000 m Interrupts/diagnostics/status information Diagnostics function Piagnostic alarm Yes | — at "0" to "1", min. | 0.4 ms |
| — at "1" to "0", max. Cable length • shielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Piagnostics function Yes Alarms • Diagnostic alarm Yes | — at "0" to "1", max. | 20 ms |
| Cable length • shielded, max. • unshielded, max. Interrupts/diagnostics/status information Diagnostics function Alarms • Diagnostic alarm Yes | — at "1" to "0", min. | 0.4 ms |
| shielded, max. unshielded, max. 500 m Interrupts/diagnostics/status information Diagnostics function Yes Alarms Diagnostic alarm Yes | — at "1" to "0", max. | 20 ms |
| unshielded, max. Interrupts/diagnostics/status information Diagnostics function Alarms Diagnostic alarm Yes | Cable length | |
| Interrupts/diagnostics/status information Diagnostics function Alarms • Diagnostic alarm Yes | • shielded, max. | 1 000 m |
| Diagnostics function Alarms Diagnostic alarm Yes Yes | • unshielded, max. | 500 m |
| Diagnostics function Alarms Diagnostic alarm Yes Yes | Interrupts/diagnostics/status information | |
| Diagnostic alarm Yes | | Yes |
| | Alarms | |
| Hardware interrupt No | Diagnostic alarm | Yes |
| | Hardware interrupt | No |

| Diagnostic massages | | |
|---|---|--|
| Diagnostic messages | Yes | |
| Monitoring the supply voltage | | |
| • Wire-break | No | |
| Short-circuit | Yes | |
| Group error | Yes | |
| Diagnostics indication LED | | |
| • 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 | |
| Potential separation | | |
| Potential separation channels | | |
| between the channels and backplane bus | Yes | |
| Permissible potential difference | | |
| between different circuits | 75 V DC/60 V AC (base isolation) | |
| 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 SIL3 | < 5.00E-05 | |
| — High demand/continuous mode: PFH in accordance with SIL3 | < 1.00E-09 1/h | |
| Ambient conditions | | |
| Ambient temperature during operation | | |
| horizontal installation, min. | -25 °C; = Tmin | |
| horizontal installation, max. | 60 °C; = Tmax | |
| 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 ships/at sea | |
| to biologically active substances according to EN 60721-3-6 | Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request |
| to chemically active substances according to EN 60721-3-6 | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * |
| to mechanically active substances according to EN 60721-3-6 | Yes; Class 6S3 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 | Yes; Class 2 for high reliability |
| Protection against fouling acc. to EN 60664-3 | Yes; Type 1 protection |
| Military testing according to MIL-I-46058C, Amendment 7 | Yes; Discoloration of coating possible during service life |
| Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A | Yes; Conformal coating, Class A |
| Dimensions | |
| Width | 35 mm |
| Height | 147 mm |
| Depth | 129 mm |
| Weights | |
| Weight, approx. | 280 g |

last modified:

05/13/2020