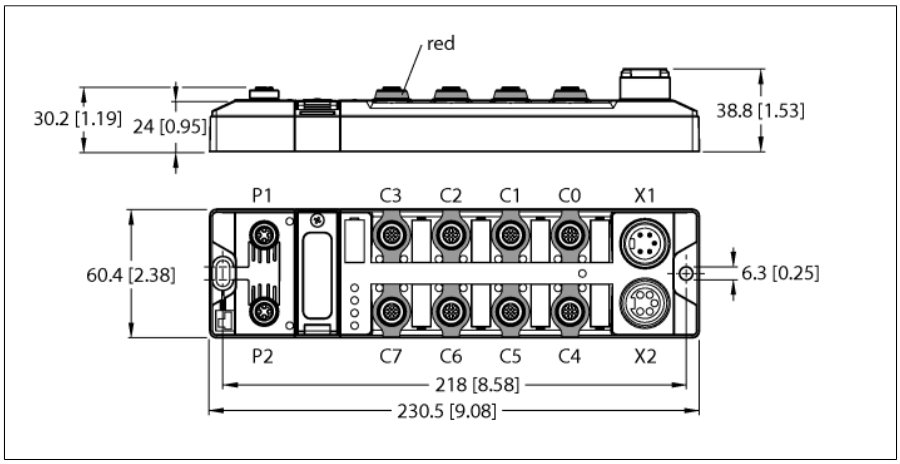
# Block Module for EtherNet/IP and CIP Safety
# Safe Digital Inputs and Outputs
# TBIP-L5-4FDI-4FDX




- **Ethernet/IP**
- **Integrated Ethernet switch**
- **10 Mbps/100 Mbps supported**
- **2 × M12, 4-pin, D-coded, Ethernet field-bus connection**
- **Glass fiber reinforced housing**
- **Shock and vibration tested**
- **Fully potted module electronics**
- **Protection classes IP65, IP67, IP69K**
- **7/8", 5-pin connectors for power supply**
- **Four safe digital SIL3 inputs**
- **Four safe configurable digital SIL3 inputs or outputs**

| | |
|---|---|
| **Type designation** | TBIP-L5-4FDI-4FDX |
| Ident no. | 100001828 |
| **Supply** | |
| Supply voltage | 24 VDC |
| Admissible range | 20.4…28.8 VDC |
| Voltage supply connection | 5-pin male 7/8" connector X1 |
| Electrical isolation | galvanic isolation of the voltage groups V1 and V2, voltages up to 500 VAC |
| **System data** | |
| Fieldbus transmission rate | 10 Mbps/100 Mbps |
| Fieldbus connection technology | 2 × M12, 4-pin, reverse-keyed |
| Web server | integrated |
| Service interface | Ethernet via P1 or P2 |
| **Ethernet/IP** | |
| Addressing | acc. to EtherNet/IP specification |
| Quick Connect (QC) | < 150 ms |
| Device Level Ring (DLR) | supported |
| Class 1 connections (CIP) | 3 |
| **Safety Data** | |
| PL acc. to DIN EN 13849-1:2008 | e |
| Category acc. to DIN EN 13849-1:2008 | 4 |
| SIL according IEC 61508 | 3 |
| Useful Lifetime | 20 years (EN ISO 13849-1) |
| **Safety Inputs OSSD** | |
| Low level signal voltage | EN 61131-2 Type 1 ( < 5 V; < 0.5 mA) |
| High level signal voltage | EN 61131-2 Type 1 ( > 15 V; > 2 mA) |
| Max. OSSD supply per channel | 2 A per C0 to C7,<br>1.5 A at 70 °C<br>Please consider derating as shown in figure 1 |
| Max. tolerance test pulse width | 1 ms |
| Interval between 2 test pulses, minimum | 20 ms at 1 ms test pulse width<br>15 ms at 0.5 ms test pulse width |
| **Safety Inputs floating/antivalent** | |
| Max. loop resistance | < 150 Ω |
| Max. cable length | max. 1 µF at 150 Ω<br>limited by line capacity |
| Test pulse, typical | 0.6 ms |
| Test pulse, maximum | 0.8 ms |
| Sensor supply | Power supply V AUX1/T1 max. 2 A<br>Please consider derating as shown in figure 1 |
| Interval between 2 test pulses, minimum | 900 ms |
| Additional information | No connection to external potential allowed |

**Figure 1**

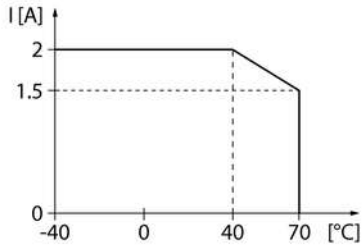
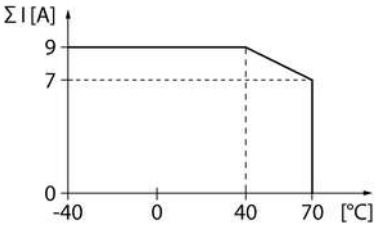



**Figure 2**




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# Block Module for EtherNet/IP and CIP Safety
# Safe Digital Inputs and Outputs
# TBIP-L5-4FDI-4FDX

| | |
|---|---|
| **Safety Outputs** | |
| Output current in off state | < 5 V |
| Output current in off state | < 1 mA<br>suitable for inputs according to EN 61131-2 Type 1 |
| Test pulse, typical | 0.5 ms |
| Test pulse, maximum | 1.25 ms |
| Interval between 2 test pulses, typical | 500 ms |
| Interval between 2 test pulses, minimum | 250 ms |
| Actuator power supply | Power supply V AUX1/T1 max. 2 A<br>Please consider derating as shown in figure 1 |
| Max. output current | 2 A (resistive)<br>1 A (inductive) |
| Additional information | The load must be mechanically or electrically inert to tolerate the test pulses.<br>When configured as a PPM switching output the negative pole of the load should be wired to the M-terminal of the corresponding output (Pin 2). |
| **Digital inputs** | |
| Connectivity inputs | M12, 5-pin |
| Input type | PNP |
| Switching threshold | EN 61131-2 Typ 3, PNP |
| Low level signal voltage | < 5 V |
| High level signal voltage | > 11 V |
| Low level signal current | < 1.5 mA |
| High level signal current | > 2 mA |
| Input delay | 2.5 ms |
| Electrical isolation | Galvanically isolated to the fieldbus<br>Voltage proof up 500 VDC |
| **Digital outputs** | |
| Connectivity outputs | M12, 5-pol |
| Output type | PNP |
| Type of output diagnostics | Channel diagnostics |
| Output voltage | 24 VDC from potential group |
| Load type | EN 60947-5-1: DC-13 |
| Short-circuit protection | yes |
| Electrical isolation | Galvanically isolated to the fieldbus<br>Voltage proof up 500 VDC |
| **Standard/Directive conformity** | |
| Directive | 2006/42/EC Machine Directive<br>2014/35/EC Low Voltage Directive<br>2014/30/EC EMC Directive |
| Vibration test | acceleration to 20 g<br>acc. to EN 60068-2-6 |
| Shock test | acc. to EN 60068-2-27 |
| Drop and topple | acc. to EN 60068-2-31/IEC 60068-2-32 |
| Electromagnetic compatibility | acc. to EN 61131-2 |
| Approvals and certificates | CE,<br>FCC,<br>UV-resistant in accordance with DIN EN ISO 4892-2A (2013) |
| UL Certificate | cULus LISTED 21 W2, Encl.Type 1 IND.CONT.EQ. |

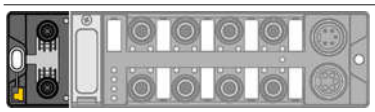
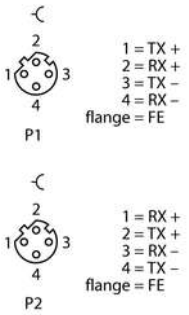
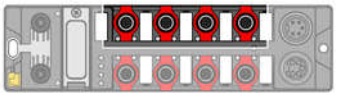
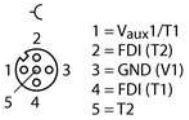
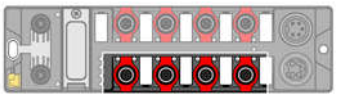
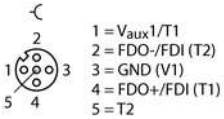
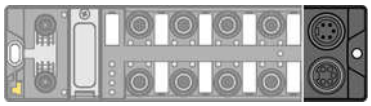
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# Block Module for EtherNet/IP and CIP Safety
# Safe Digital Inputs and Outputs
# TBIP-L5-4FDI-4FDX

| | |
|---|---|
| **General Information** | |
| Dimensions (W x L x H) | 60.4 x 230.4 x 39mm |
| Operating temperature | -40…+70 °C |
| Storage temperature | -40 °C … +85 °C |
| Altitude | max.  5000 m |
| Protection class | IP65<br>IP67<br>IP69K |
| Housing material | PA6-GF30 |
| Housing color | Black |
| Window material | Lexan |
| Material screw | 303 stainless steel |
| Material label | Polycarbonate |
| Halogen-free | yes |
| Mounting | 2 mounting holes □ 6.3 mm |

The data sheet serves as advance information. For definitive values see the corresponding product manual. In this respect, no liability for completeness and accuracy can be applied to the content of this data sheet.

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| | | |
|---|---|---|
|  | **Note**<br>Ethernet cable (example):<br>RSSD-RSSD-441-2M/S2174<br>Ident. no. 6914218 | M12 × 1 Ethernet<br> |
|  | **Note**<br>Actuator and sensor cable/PUR connection cable (example):<br>RKC4.5T-2-RSC4.5T/TXY<br>Ident. no. 6629805 | M12 × 1 Safety Inputs<br> |
|  | **Note**<br>Actuator and sensor cable/PUR connection cable (example):<br>RKC4.5T-2-RSC4.5T/TXY<br>Ident. no. 6629805 | M12 × 1 Safety I/O Port<br> |
|  | **Note**<br>Power supply cable (example):<br>RKM52-1-RSM52<br>Ident. no. 6914149 | 7/8" Power Supply<br> |

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**Module Status LED**

| LED | Color | Status | Description |
|---|---|---|---|
| **ETH1 / ETH2** | Green | On | Ethernet Link (100 Mbps) |
| | | flashing | Ethernet communication (100 Mbps) |
| | | Off | No Ethernet link |
| **NS** | Green | On | Active connection to a master |
| | | flashing | Connection has been established but not fully completed |
| | Red | On | Communication Error |
| | | flashing | One or more I/O connections have the time-out status. |
| | Red/Green | Alternating | Faulty self-test or configuration |
| **MS** | Green | On | Diagnostics disabled |
| | Green | Flashing | When used as a stand-alone device: Device is in protective mode, an EtherNet/IP™ client is accessing the standard I/Os. |
| | Red | On | Critical error |
| | Red | Flashing | Correctable error |
| | Green/ Red | Flashing alternately | Faulty self-test or configuration |
| **PWR** | Green | On | Voltage OK |
| | Red | On | Voltage faulty |
| **WINK** | White | Flashing | Supports the blink/wink commands |

**LED Status I/O**

| LED | Color | Status | Description |
|---|---|---|---|
| 0…7 | Green | On | Channel active |
| | | flashing | Self test |
| | Red | On | Discrepancy |
| | | flashing | Cross circuit |
| 8…15 | Green | On | Channel active |
| | | flashing | Self test (input only) |
| | Red | On | Discrepancy, overload (output only) |
| | | flashing | Cross circuit |

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**Process Data Mapping of the Single Protocols**

For more details on the corresponding protocols see manual.

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