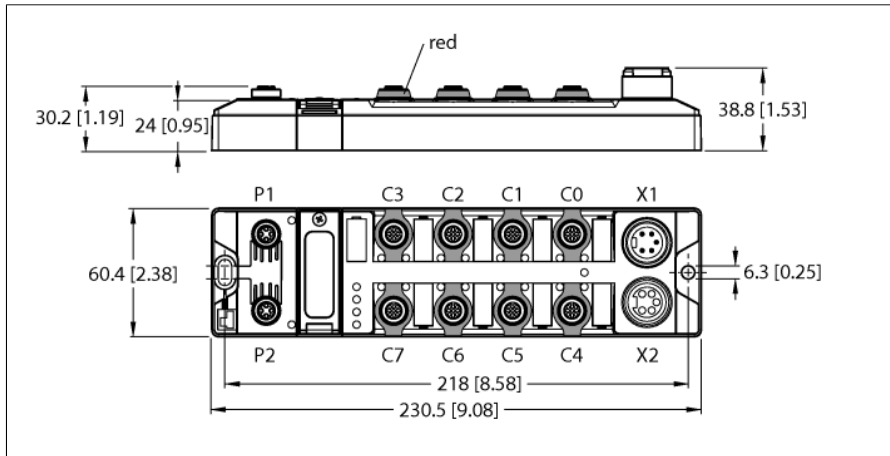


Hybrid Module for EtherNet/IP and CIP-Safety
Safe Digital Inputs and Outputs
TBIP-L4-4FDI-4FDX



- EtherNet/IP™
- Integrated Ethernet switch
- 10 Mbps / 100 Mbps supported
- 2 x male M12, 4-pin, D-coded, Ethernet-Fieldbus connection
- Glass fiber reinforced housing
- Shock and vibration tested
- Fully potted module electronics
- Protection classes IP65, IP67, IP69K
- 7/8" males, 4-pin, for power supply
- Two safe digital SIL3-inputs
- Four secure digital SIL3 channels as FDI or FDO (PP, PM)
- Four secure digital SIL3 FDI channels

Type designation TBIP-L4-4FDI-4FDX
Ident-No. 100001827

Supply
Supply voltage 24 VDC
Admissible range 20.4...28.8 VDC
Voltage supply connection 4-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 x M12, 4-pin, D-coded
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 Jahre (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, 1.5 A at 70 °C
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 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 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
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

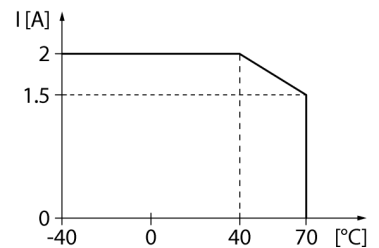
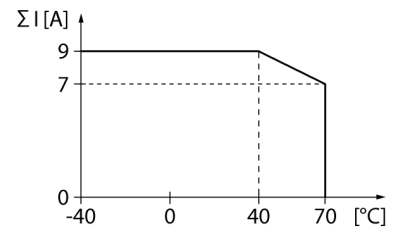


Figure 2



Hybrid Module for EtherNet/IP and CIP-Safety

Safe Digital Inputs and Outputs

TBIP-L4-4FDI-4FDX

Safety Outputs

Output current in off state	< 5 V
Output current in off state	< 1 mA
	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
	Please consider derating as shown in figure 1
Max. output current	2 A (resistive)
	1 A (inductive)
Additional information	The load must be mechanically or electrically inert to tolerate the test pulses.
	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
	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
Short-circuit protection	yes
Electrical isolation	Galvanically isolated to the fieldbus
	Voltage proof up 500 VDC

Standard/Directive conformity

Vibration test	acceleration to 20 g
	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, FCC, UV-resistant in accordance with DIN EN ISO 4892-2A (2013)
UL Certificate	cULus LISTED 21 W2, Encl.Type 1 IND.CONT.EQ.

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 IP67 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

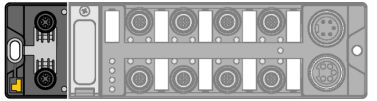
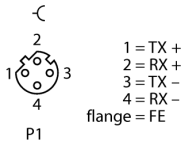
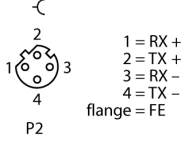
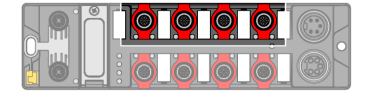
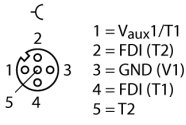
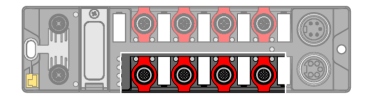
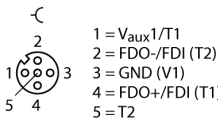
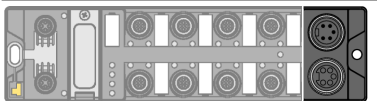
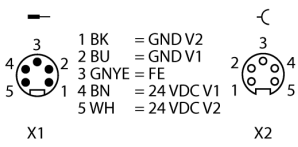
Hybrid Module for EtherNet/IP and CIP-Safety

Safe Digital Inputs and Outputs

TBIP-L4-4FDI-4FDX

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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Safe Digital Inputs and Outputs
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	<p>Accessories Ethernet cable (example): RSSD RSSD 441-2M Ident no. U-02482</p>	<p>M12 × 1 Ethernet</p>  <p>P1</p>  <p>P2</p>
	<p>Accessories Actuator and sensor cable/PUR connection cable (example): RKC4.5T-2-RSC4.5T/TXY Ident. no. 6629805</p>	<p>M12 × 1 Safety Inputs</p> 
	<p>Accessories Actuator and sensor cable/PUR connection cable (example): RKC4.5T-2-RSC4.5T/TXY Ident. no. 6629805</p>	<p>M12 × 1 Safety I/O Port</p> 
	<p>Accessories Power supply cable (example): RSM RKM 50-2M Ident no. U2282-0</p>	<p>7/8" Power Supply</p>  <p>X1 X2</p>

Hybrid Module for EtherNet/IP and CIP-Safety

Safe Digital Inputs and Outputs

TBIP-L4-4FDI-4FDX

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

Hybrid Module for EtherNet/IP and CIP-Safety

Safe Digital Inputs and Outputs

TBIP-L4-4FDI-4FDX

Process Data Mapping of the Single Protocols

For more details on the corresponding protocols see manual.