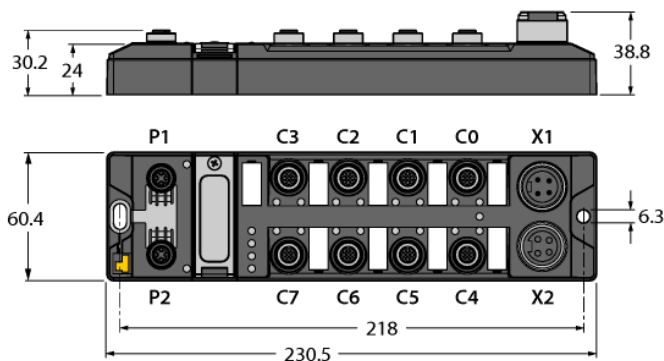


Compact Multiprotocol I/O Module for Ethernet 8 Digital PNP Inputs and 8 Digital PNP Outputs 2 A TBEN-L4-8DIP-8DOP

TURCK
works

Industrial
Automation



- PROFINET® device, EtherNet/IP™ device or Modbus® TCP slave
- Integrated Ethernet switch
- Supports 10 Mbps/100 Mbps
- 2x 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" connector for power supply, 4-pin
- Separated power groups for safety shutdown
- Input diagnostics per port
- Max. 2 A per output
- Output diagnostics per channel
- FLC/ARGE version programmable

Type designation Ident-No.

TBEN-L4-8DIP-8DOP
6814010

Supply

Supply voltage	24 VDC
Admissible range	18...30 VDC
	Total current max. 9 A per voltage group
	Total current V1 + V2 max. 11 A
Voltage supply connection	4-pin male 7/8" connector X1
Sensor/Actuator supply V_{AUX1}	supply of ports C0-C3 from V1
	short-circuit proof, 120 mA per port
Sensor/Actuator supply V_{AUX2}	supply of ports C4-C7 from V2
	short-circuit proof, 120mA per port
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
Protocol detection	automatic
Web server	Default: 192.168.1.254
Service interface	Ethernet via P1 or P2

Field Logic Controller (FLC)

Supported from firmware version	3.2.9.0
Released from ARGE version	2.0.24.0

Modbus TCP

Addressing	Static IP, BOOTP, DHCP
Supported function codes	FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23
Number of TCP connections	8
Input register start address	0 (0x0000 hex)
Output register start address	2048 (0x0800 hex)

EtherNet/IP™

Addressing	acc. to EtherNet/IP™ specification
Quick Connect (QC)	< 150 ms
Device Level Ring (DLR)	supported
Class 3 connections	3
Class 1 connections	10
Input Assembly Instance	103
Output Assembly Instance	104
Configuration Assembly Instance	106

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PROFINET

Addressing	DCP
Conformance class	B (RT)
MinCycleTime	1 ms
Fast Start-Up (FSU)	< 150 ms
Diagnostics	acc. to PROFINET alarm handling
Topology detection	supported
Automatic addressing	supported
Media Redundancy Protocol (MRP)	supported

Digital inputs

Number of channels	8
Connectivity inputs	M12, 5-pin
Input type	PNP
Type of input diagnostics	Group diagnostics
Switching hreshold	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	galvanic isolation to P1/P2 , voltages up to 500 VDC

Digital outputs

Number of channels	8
Connectivity outputs	M12, 5-pol
Output type	PNP
Type of output diagnostics	Channel diagnostics
Output voltage	24 VDC from potential group
Output current per channel	2.0 A, short-circuit proof, max. 2.0 A per port
Output delay	1.3 ms
Load type	EN 60947-5-1: DC-13
Short-circuit protection	yes
Electrical isolation	galvanic isolation to P1/P2 , voltages up to 500 VDC

Standard/Directive conformity

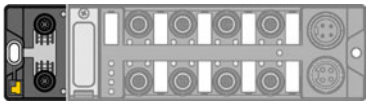
Vibration test	acceleration to 20 g acc. to EN 60068-2-6
Shock test	acc. to EN 60068-2-27
Drop and topple	acc. to EN 60068-2-31/IEC 60068-2-32
Electromagnetic compatibility	acc. to EN 61131-2
Approvals and certificates	CE, FCC
UL conditions	cULus LISTED 21 W2, Encl.Type 1 IND.CONT.EQ.

General Information

Dimensions (W x L x H)	60.4 x 230.4 x 39mm
Operating temperature	-40...+70 °C
Storage temperature	-40...+85 °C
Altitude	max. 5000 m
Protection class	IP65 IP67 IP69K
MTTF	205 years acc. to SN 29500 (Ed. 99) 20 °C
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

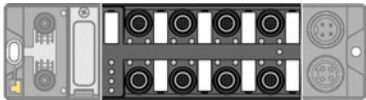
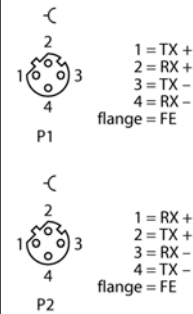
Note the numbering of the IO range:
From firmware version 3.2.9.0 and higher ports C0 to C7 and channels CH0 to CH15 are counted. The process data image is unchanged. For more details on the corresponding change see manual.

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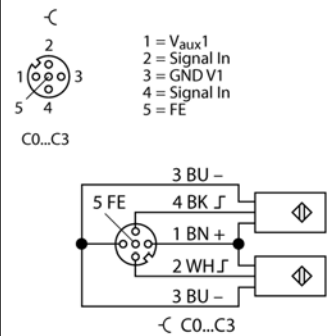
Accessories
 Ethernet cable (example):
 RSSD RSSD 441-2M
 Ident no. U-02482

M12 x 1 Ethernet

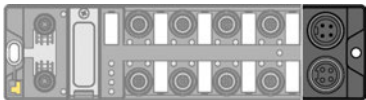
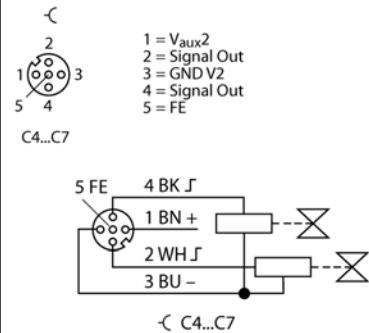


Accessories
 Accessories:
 Connection cable , 2-channel (example):
 RK 4.4T-2-RS 4.4T
 Ident no. U2445
 Splitter, 1-channel (example):
 YB2-FSM 4.5-2FKM 4.5
 Ident no. U0875-78

M12 x 1 Input

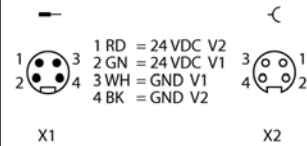


Output M12 x 1



Accessories
 Power supply cable (example):
 RSM RKM 40-2M
 Ident no. U2280-0

7/8" Power Supply



Compact Multiprotocol I/O Module for Ethernet
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Module LED Status

LED	Color	Status	Description
ETH1 / ETH2	Green	ON	Ethernet link (100 Mbps)
		flashing	Ethernet communication (100 Mbps)
	Yellow	ON	Ethernet link (10 Mbps)
		flashing	Ethernet communication (10 Mbps)
		OFF	No Ethernet link
BUS	Green	ON	Active connection to a master
		Flashing	Steady flashing: Ready Sequence of 3 flashes in 2 seconds: FLC/ARGE active
	Red	ON	IP address conflict or Restore Mode or Modbus timeout
		Flashing	Blink/Wink command active
	Green/red	Alternating	Autonegotiation and/or waiting for DHCP/Boot-P addressing
		OFF	Power off
ERR	Green	ON	Diagnostics disabled
	Red	ON	Diagnostics enabled V ₂ undervoltage diagnosis is parameter-dependent
PWR	LED response parameter (PWR) at V ₂ Undervoltage = "red"		
	Green	ON	V ₁ and V ₂ power on
	Red	ON	V ₂ power off or below defined tolerance of 18 V
		OFF	V ₁ power off or below defined tolerance of 18 V
	LED response parameter (PWR) at V ₂ Undervoltage = "green"		
	Green	ON	V ₁ and V ₂ power on
		Flashing	V ₂ power off or below defined tolerance of 18 V
		OFF	V ₁ power off or below defined tolerance of 18 V

LED Status I/O

LED	Color	Status	Description
LED 0...7	Green	ON	Input active
	Red	flashing	Power overload at the corresponding port. Both port LEDs are flashing.
		OFF	Input inactive
LED 8 ... 15	Green	ON	Output active
	Red	ON	Output active with overload/short circuit
		flashing	Power overload at the corresponding port. Both port LEDs are flashing.
		OFF	Output inactive

Compact Multiprotocol I/O Module for Ethernet

8 Digital PNP Inputs and 8 Digital PNP Outputs 2 A

TBEN-L4-8DIP-8DOP



Industrial
Automation

Process Data Mapping of the Single Protocols

For more details on the corresponding protocols see manual.

Modbus TCP Register Mapping

	Reg	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Inputs (RO)	0x0000									DI7 C3P2	DI6 C3P4	DI5 C2P2	DI4 C2P4	DI3 C1P2	DI2 C1P4	DI1 C0P2	DI0 C0P4
Status (RO)	0x0001	-	FCE	-	-	CFG	COM	V1	-	V2	-	-	-	-	-	-	Diag Warn
Diag (RO)	0x0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I/O Diag
Inputs (RW)	0x0800									DI7 C3P2	DI6 C3P4	DI5 C2P2	DI4 C2P4	DI3 C1P2	DI2 C1P4	DI1 C0P2	DI0 C0P4
Outputs (RW)	0x0800									DO15 C7P2	DO14 C7P4	DO13 C6P2	DO12 C6P4	DO11 C5P2	DO10 C5P4	DO9 C4P2	DO8 C4P4
I/O Diag (RO)	0xA000	SCO15	SCO14	SCO13	SCO12	SCO11	SCO10	SCO9	SCO8	SCS7	SCS6	SCS5	SCS4	SCS3	SCS2	SCS1	SCS0

EtherNet/IP™ data mapping with activated scheduled diagnostics, default settings

	Word	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input data (station -> scanner)																	
GW status	0	-	FCE	-	-	CFG	COM	V1	-	V2	-	-	-	-	-	-	Diag Warn
Inputs	1									DI7 C3P2	DI6 C3P4	DI5 C2P2	DI4 C2P4	DI3 C1P2	DI2 C1P4	DI1 C0P2	DI0 C0P4
Diag 1	2	-	-	Sched Diag	-	-	-	-	-	-	-	-	-	-	-	-	I/O Diag
Diag 2	3	SCO15	SCO14	SCO13	SCO12	SCO11	SCO10	SCO9	SCO8	SCS7	SCS6	SCS5	SCS4	SCS3	SCS2	SCS1	SCS0
Output data (scanner -> station)																	
Control	0	reserved															
Outputs	1									DO15 C7P2	DO14 C7P4	DO13 C6P2	DO12 C6P4	DO11 C5P2	DO10 C5P4	DO9 C4P2	DO8 C4P4

EtherNet/IP™ data mapping with activated summarized diagnostics

	Word	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input data (station -> scanner)																	
GW status	0	-	FCE	-	-	CFG	COM	V1	-	V2	-	-	-	-	-	-	Diag Warn
Inputs	1									DI7 C3P2	DI6 C3P4	DI5 C2P2	DI4 C2P4	DI3 C1P2	DI2 C1P4	DI1 C0P2	DI0 C0P4
Diag 1	2	-															I/O Diag
Output data (scanner -> station)																	
Control	0	reserved															
Outputs	1									DO15 C7P2	DO14 C7P4	DO13 C6P2	DO12 C6P4	DO11 C5P2	DO10 C5P4	DO9 C4P2	DO8 C4P4

PROFINET process data

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Inputs	0	DI8 C4P2	DI7 C4P4	DI6 C3P2	DI5 C3P4	DI4 C2P2	DI3 C2P4	DI2 C1P2	DI1 C1P4
Outputs	0	DO8 C8P2	DO7 C8P4	DO6 C7P2	DO5 C7P4	DO4 C6P2	DO3 C6P4	DO2 C5P2	DO1 C5P4

Key:

DIx	Digital input channel x	CFG	I/O Configuration error
DOx	Digital output channel x	FCE	I/O-ASSISTANT Force Mode active
Cx	Port x	I/ODiag	I/O diagnostics connected
Px	Pin x	SchedDiag	Manufacturer-specific diagnostics configured and active
DiagWarn	Diagnostic at least on 1 channel	SCSx	Short-circuit at port x
V1	Undervoltage V1	SCG1	Short-circuit supply ports C0-C3
V2	Undervoltage V2	SCG2	Short-circuit supply ports C4-C7
COM	Communication error on internal module bus	SCOx	Short-circuit output channel x