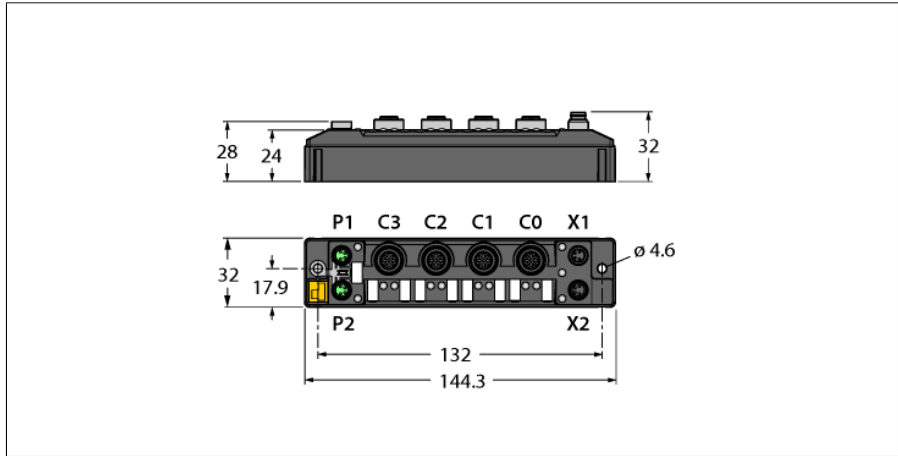


# Compact Multiprotocol I/O Module for Ethernet

## 8 Universal Digital Channels, Configurable as PNP Inputs or 2 A Outputs

### TBEN-S2-8DXP



- PROFINET device, EtherNet/IP device or Modbus TCP slave
- Integrated Ethernet switch
- Supports 10 Mbps / 100 Mbps
- 2x M8, 4-pin, Ethernet fieldbus connection
- Glass fiber reinforced housing
- Shock and vibration tested
- Fully potted module electronics
- Protection classes IP65, IP67, IP69K
- 4-pin M8 male connector for power supply
- Galvanically isolated voltage groups
- Diagnostics of the supply per I/O port
- Max. 2 A per output
- Output diagnostics per channel
- Two freely selectable digital channels per port
- Pin1 switchable per I/O port
- FLC/ARGE programmable

<b>Type designation</b>	TBEN-S2-8DXP
Ident no.	6814076

<b>Supply</b>	
Supply voltage	24 VDC
Admissible range	18...30 VDC
	Total current max. 4 A per voltage group
	Total current V1 + V2 max. 5.5 A at 70 °C per module
Voltage supply connection	2 × M8, 4-pin
Operating current	V1: max. 150 mA
Sensor/Actuator supply V <sub>AUX1</sub>	Ports C0-C1 powered by V1 Pin1 supply switchable for each port Short-circuit proof, 0.5 A per port
Sensor/Actuator supply V <sub>AUX2</sub>	Ports C2-C3 powered by V2 Pin1 supply switchable for each port Short-circuit proof, 0.5 A per port
Electrical isolation	galvanic isolation of the voltage groups V1 and V2, voltages up to 500 VAC

<b>System data</b>	
Fieldbus transmission rate	10/100 Mbps
Fieldbus connection technology	2 × M8, 4-pin
Protocol detection	automatic
Web server	default: 192.168.1.254
Service interface	Ethernet via P1 or P2
BEEP functionality	Supported

<b>Field Logic Controller (FLC)</b>	
ARGE Firmware Version	3.0.1.0
ARGE Engineering Version	2.0.25.0

<b>Modbus TCP</b>	
Addressing	Static IP, 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)

<b>Ethernet/IP</b>	
Addressing	acc. to EtherNet/IP specification
Quick Connect (QC)	< 500 ms
Device Level Ring (DLR)	supported
Class 3 connections (TCP)	3
Class 1 connections (CIP)	10
Input Assembly Instance	103
Output Assembly Instance	104
Configuration Assembly Instance	106

# Compact Multiprotocol I/O Module for Ethernet

## 8 Universal Digital Channels, Configurable as PNP Inputs or 2 A Outputs

### TBEN-S2-8DXP

---

#### PROFINET

Version	2.35
Addressing	DCP
Conformance class	B (RT)
MinCycleTime	1 ms
Fast Start-Up (FSU)	< 500 ms
Diagnostics	acc. to PROFINET alarm handling
Topology detection	supported
Automatic addressing	supported
Media Redundancy Protocol (MRP)	supported
System redundancy	S2
Netload class	3

---

#### Digital inputs

Number of channels	8
Connectivity inputs	M12, 5-pin
Input type	PNP
Type of input diagnostics	Channel diagnostics
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	0.2 ms / 3 ms
Electrical isolation	Galvanically isolated to the fieldbus Voltage proof up to 500 VDC

---

#### Digital outputs

Number of channels	8
Connectivity outputs	M12, 5-pin
Output type	PNP
Type of output diagnostics	Channel diagnostics
Output voltage	24 VDC from potential group
Output current per channel	2 A, short-circuit proof
Load type	EN 60947-5-1: DC-13
Short-circuit protection	yes
Electrical isolation	Galvanically isolated to the fieldbus Voltage proof up to 500 VDC

---

#### Standard/Directive conformity

Vibration test	Acc. to EN 60068-2-6 Acceleration up to 20 g
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

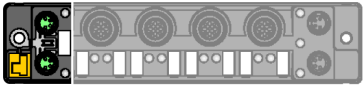
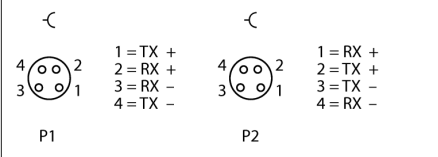
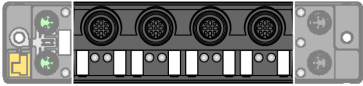
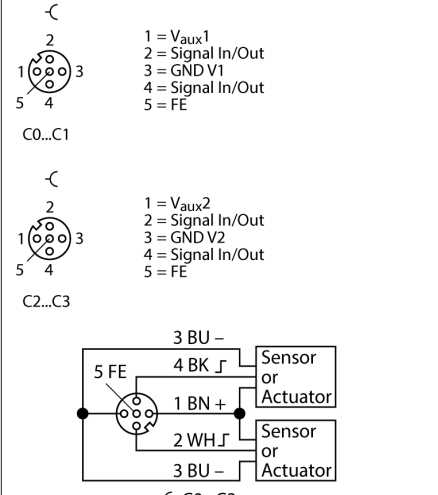

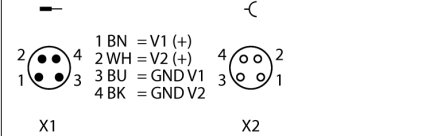
Dimensions (W x L x H)	32 x 144 x 32mm
Ambient temperature	-40...+70 °C
Storage temperature	-40...+85 °C
Altitude	max. 5000 m
Protection class	IP65 IP67 IP69K
MTTF	238 years acc. to SN 29500 (Ed. 99) 20 °C
Housing material	PA6-GF30
Housing color	Black
Male connector material	Nickel-plated brass
Material label	Polycarbonate
Halogen-free	yes
Mounting	2 mounting holes □ 4.6 mm

# Compact Multiprotocol I/O Module for Ethernet

## 8 Universal Digital Channels, Configurable as PNP Inputs or 2 A Outputs

### TBEN-S2-8DXP

A comprehensive list of accessories for the TBEN-S product family is available at: <https://www.turck.de/attachment/d301367.pdf>

	<p><b>Note</b> It is strongly recommended to use only ready-made Ethernet cables! Ethernet cable (example): M8-M8: ID number 6630376 PSG4M-0,2-PSG4M/TXN ID number 6934033 PSGS4M-PSGS4M-4416-1M M8-RJ45: ID number 6935342 PSGS4M-RJ45S-4416-1M M8-M12: ID number 6935351 RSSD-PSGS4M-4416-2M</p>	<p>M8 x 1 Ethernet</p> 
	<p><b>Note</b> <math>V_{AUX}</math> (Pin1) supply switchable for each port Actuator and sensor cable/PUR connection cable (example): RKC4.4T-2-RSC4.4T/TXL Ident. no. 6625608 Connection cable with Y piece for single assignment VBRS4.4-2RKC4T-1/1/TEL Ident. no. 6628199</p>	<p>M12 x 1 Input</p> 
	<p><b>Note</b> Power supply cable (example): M8-M8 ID number 6627044 PKG4M-0,2-PSG4M/TXL ID number 6626679 PKG4M-4-PSG4M/TXL</p>	<p>M8 x 1 Voltage Supply</p> 

## Compact Multiprotocol I/O Module for Ethernet

### 8 Universal Digital Channels, Configurable as PNP Inputs or 2 A Outputs

#### TBEN-S2-8DXP

#### Module Status LED

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/ARGEE active
	Red	ON	IP address conflict or Restore Mode or Modbus timeout
		Flashing	Blink/Wink command active
	Red/ Green	Alternating	Waiting for assignment of an IP address, DHCP or BootP
	OFF	Power off	
ERR	Green	On	No diagnostics available
	Red	On	Diagnostics available Undervoltage diagnosis response is parameter dependent
	LED response master in the Beep network:		
	Green	1 Hz, 250 ms off	Cyclical IO data exchange
	Green/red	1 Hz, 250 ms red	Cyclical IO data exchange, diagnostics available
	Green/red	1 Hz, alternating	Discovery mode active
	Red		Discovery mode active, diagnostics available
PWR	Green	On	V <sub>1</sub> and V <sub>2</sub> power supply OK
	Red	On	V <sub>2</sub> power supply off or below defined threshold of 18 V
		Off	V <sub>1</sub> power supply off or below defined threshold of 18 V

#### LED Status I/O

LED	Color	Status	Description
LED 0 ... 7	Green	ON	Input or output active
	Red	ON	Output active with overload/short circuit
		Flashing	Power overload at the corresponding port. Both port LEDs are flashing.
		OFF	Input or output inactive
LED 7	White	Flashing	Blink/Wink command active

# Compact Multiprotocol I/O Module for Ethernet

## 8 Universal Digital Channels, Configurable as PNP Inputs or 2 A Outputs

### TBEN-S2-8DXP

#### Process Data Mapping of the Single Protocols

For more details on the corresponding protocols see manual.

#### Modbus TCP

Register Addressing (16-bit)

Offset Process Input Data: 0x0000, structure acc. to general register mapping

Offset Process Output Data: 0x0800: Structure acc. to general register mapping

#### Ethernet/IP

Word Addressing (16-bit)

#### Process Input Data (Station -> Scanner)

Status Word is located in front of the general process data!

	Reg/ 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
GW status	0x0000	-	FCE	-	-	CFG	COM	V1	-	V2	-	-	-	-	-	-	Diag Warn
	0x0001	Structure acc. to general register mapping															
	...																

#### Process Output Data (Scanner -> Station)

Control-Word is located in front of the general process data!

	Reg/ 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
Control	0x0000	Reserved															
	0x0001	Structure acc. to general register mapping															
	...																

#### PROFINET:

Byte addressing (8-bit)

Offset Process Input Data: 0x0000, structure acc. to general register mapping

Offset Process Output Data: 0x0000: Structure acc. to general register mapping

#### General register mapping:

Address details are relative, offset of the respective protocol is to be observed.

Channel assignment/port/pin:

Channel										Ch7	Ch6	Ch5	Ch4	Ch3	CH2	CH1	CH0
										DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0
Port										C3	C3	C2	C2	C1	C1	C0	C0
Pin										P2	P4	P2	P4	P2	P4	P2	P4

#### Process input data:

	Reg/ word	Byte	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
			MSB								LSB							
Digital inputs	0x0000	0x0000	-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0
Diagnostics	0x0001	0x0002	ERR7	ERR6	ERR5	ERR4	ERR3	ERR2	ERR1	ERR0	-	-	-	-	VERR V2	VERR V2	VERR V1	VERR V1
															P1C3	P1C2	P1C1	P1C0
Latch input	0x0002	0x0004	-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0
Counter Ch0	0x0003	0x0006	Counter value LSB															
	0x0004	0x0008	Counter value MSB															
Frequency Ch0	0x0005	0x000A	Frequency MSB								Frequency LSB							
Status	0x0006	0x000C	-	-	-	-	-	-	-	-	Status							
PWM diagnos- tics Ch3	0x0007	0x000E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PWM OUT ERR
PWM diagnos- tics Ch7	0x0008	0x0010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PWM OUT ERR
Module status	0x0009	0x0012	-	FCE	-	-	-	COM	V1	-	V2	-	-	-	-	-	-	DIAG

#### Process output data:

	Reg/ word	Byte	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
			MSB								LSB							
Digital outputs	0x0000	0x0000	-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0

