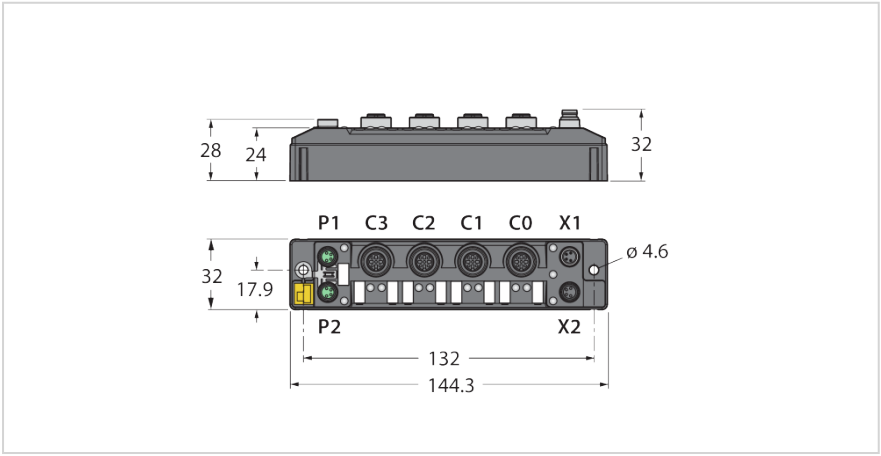
TBEN-S2-8DXP

Compact Multiprotocol I/O Module for Ethernet

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





Type designation	TBEN-S2-8DXP
Ident-No.	6814076

Technical data

Power supply	
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 x M8, 4-pin, A-coded
Operating current	V1: max. 150 mA
Sensor/actuator supply	Ports C0-C1 powered by V1 Power supply Pin1 switchable for each port Short-circuit proof, 0.5 A per port
Sensor/actuator supply	Slots C2-C3 supplied by V2 Power supply Pin1 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
Electrical data	
Short-circuit protection	yes
System data	

Features

- PROFINET device, EtherNet/IP device, Modbus TCP server, CC-Link IE field basic
- Integrated Ethernet switch
- Supports 10 Mbps/100 Mbps
- 2 × M8, 4-pin, Ethernet fieldbus connection
- PROFINET S2 system redundancy
- 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
- ATEX zone 2/22
- CCC-Ex
- 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
- Programmable ARGEE

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Technical data

Fieldbus transmission rate	10/100 Mbps
Fieldbus connection technology	2 x M8, 4-pin
Protocol detection	automatic
Web server	default: 192.168.1.254
Service interface	Ethernet via P1 or P2
BEEP functionality	Supported
ARGEE functionality	Supported
Field logic controller (FLC)	
ARGEE Firmware Version	3.0.1.0
ARGEE Engineering Version	2.0.25.0
Modbus TCP	
Addressing	Static IP, DHCP
Supported function codes	FC3, FC4, FC6, 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)	< 500 ms
Min. RPI	2 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
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

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Technical data

Netload class	3
CC-Link	
Interface	CC-Link IE Field Basic
Type	Intelligent device station
Message Transmission	Yes
Number of occupied stations	1
IP change mechanism	Yes
Acyclic SLMP communication	Yes
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 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
Electrical isolation	Galvanically isolated to the fieldbus Voltage proof up 500 VDC
Mechanical data	
Dimensions	144 mm x 32 mm x 32 mm
Housing material	PA6-GF30
Housing color	Black
Material label	Polycarbonate
Male connector material	Nickel-plated brass
Mounting	2 fixing holes, Ø 4.6 mm

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Technical data

Ambient conditions	
Ambient temperature	-40...+70 °C
Storage temperature	-40…+85 °C
Altitude	max. 5000 m
Electromagnetic compatibility	Acc. to EN 61131-2
Shock test	acc. to EN 60068-2-27
Vibration test	Acc. to EN 60068-2-6, acceleration up to 20 g
Protection class	IP65 IP67 IP69K
Standards/directives	
Drop and topple	acc. to EN 60068-2-31/IEC 60068-2-32
Tests/approvals	
Approvals and certificates	CE UKCA ATEX zone 2/22 CCC-Ex FCC statement, UV resistant acc. to DIN EN ISO 4892-2A (2013)
UL Certificate	cULus LISTED 21 W2, Encl.Type 1 IND.CONT.EQ.
Note on ATEX/IECEx	The Quick Start Guide with information on use in Ex areas must be observed.
MTTF	238 Years acc. to SN 29500 (Ed. 99) 20 °C
Other properties	
Halogen-free	yes
Comments	
Packaging unit	1

Module status LED

LED	*Color*	*Status*	*Description*
ETH1 / ETH2	grün	an	Ethernet Link (100 MBit/s)
		blinkt	Ethernet Kommunikation (100 MBit/s)
	gelb	an	Ethernet Link (10 MBit/s)
		blinkt	Ethernet Kommunikation (10 MBit/s)
		aus	Kein Ethernet Link

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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_1 and V_2 power supply OK
	Red	On	V_2 power supply off or V_2 undervoltage
		Off	V_1 power supply off or V_1 undervoltage

LED Status I/O

LED	***Farbe***	***Status***	***Beschreibung***
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

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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*	*Bit3*	*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*	*Bit3*	*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 Pin		-	-	-	-	-	-	-	-	C3 P2	C3 P4	C2 P2	C2 P4	C1 P2	C1 P4	C0 P2	C0 P4

Process input 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*	*Bit3*	*Bit 2*	*Bit 1*	*Bit 0*
		Byte	*Bit 7*	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*	*Bit 7*	*Bit 6*	*Bit 5*	*Bit 4*	*Bit3*	*Bit 2*	*Bit 1*	*Bit 0*
			MSB								LSB							

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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 P1C3	VERR V2 P1C2	VERR V1 P1C1	VERR V1 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 diagnostics Ch3	0x0007	0x000E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PWM OUT ERR
PWM diagnostics Ch7	0x0008	0x0010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	PWM OUT ERR
Module status	0x0009	0x0012	-	FCE	-	-	-	COM	V1	-	V2	-	-	-	-	-	-	DIAG

Process output 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***	***Bit3***	***Bit 2***	***Bit 1***	***Bit 0***
		Byte	***Bit 7***	***Bit 6***	***Bit 5***	***Bit 4***	***Bit 3***	***Bit 2***	***Bit 1***	***Bit 0***	***Bit 7***	***Bit 6***	***Bit 5***	***Bit 4***	***Bit3***	***Bit 2***	***Bit 1***	***Bit 0***
			MSB								LSB							
Digital outputs	0x0000	0x0000	-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0
Latch reset	0x0001	0x0002	-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0
Control	0x0002	0x0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CNT_ RST
PWM Ch3	0x0003	0x0006	-	-	-	-	-	-	-	-	Duty cycle							
PWM Ch7	0x0004	0x0008	-	-	-	-	-	-	-	-	Duty cycle							
VAUX control	0x0005	0x000F	-	-	-	-	-	-	-	-	-	-	-	-	VAUX2 P1 C3	VAUX2 P1 C2	VAUX1 P1 C1	VAUX1 P1 C0

Legend:

V1	Undervoltage V1	CFG	I/O configuration error

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V2	Undervoltage V2	FCE	I/O-ASSISTANT Force Mode active
Cx	Port x	Px	Pin x
DIx	Digital input channel x	DOx	Digital output channel x
Diag	Module diagnostics available	ERR x	Overcurrent output channel x
VERRVxCHyz	Overcurrent supply VAUXx channel y to z	PWMOUTERR	Overcurrent PWM output
VERRVxPyCz	Overcurrent supply VAUXx, pin y, port z	VAUXxPyCz	Supply VAUXx, pin y, port z
		CNT_RST	Counter reset

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