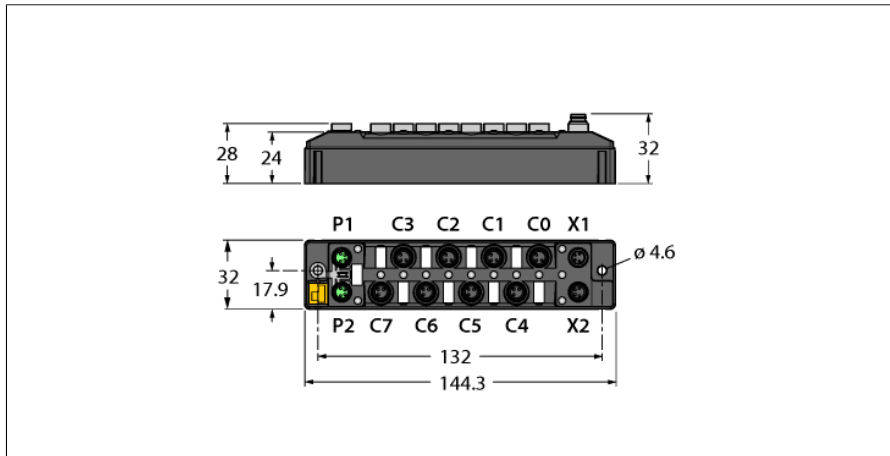


Compact Multiprotocol I/O Module for Ethernet

4 Digital PNP Inputs and 4 Digital PNP Outputs 2 A

TBEN-S1-4DIP-4DOP



- EtherNet/IP™, Modbus® TCP, or PROFINET® slave
- Integrated Ethernet switch
- 10 Mbps / 100 Mbps supported
- 2 x male M8, 4-pin, Ethernet-Fieldbus connection
- Glass fiber reinforced housing
- Shock and vibration tested
- Fully potted module electronics
- Protection classes IP65, IP67, IP69K
- FLC/ARGEE programmable
- Input diagnostics in groups
- Max. 2 A per output
- Output diagnostics per channel
- Male M8, 4-pin, for power supply
- Separated power groups for safety shutdown

Type designation	TBEN-S1-4DIP-4DOP
Ident-No.	6814021

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
Sensor/Actuator supply V _{AUX1}	supply of ports C0-C3 from V1 short-circuit proof, 0.5 A for group C0-C3
Sensor/Actuator supply V _{AUX2}	supply of ports C4-C7 from V2 short-circuit proof, 0.5 A for group C4-C7
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 M8, 4-pin
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	3.1.4.0
Released from ARGEE 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)	< 500 ms
Device Level Ring (DLR)	supported
Number of TCP connections	3
Number of CIP connections	10
Input Assembly Instance	103
Output Assembly Instance	104
Configuration Assembly Instance	106

Compact Multiprotocol I/O Module for Ethernet

4 Digital PNP Inputs and 4 Digital PNP Outputs 2 A

TBEN-S1-4DIP-4DOP

TURCK
works

Industrial
Automation

PROFINET

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

Digital inputs

Number of channels	4
Connectivity inputs	M8, 3-pin
Input type	PNP
Type of input diagnostics	group 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
Potential separation	galvanic isolation to P1/P2 , voltages up to 500 VDC

Digital outputs

Number of channels	4
Connection Technology Outputs	M8, 3-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
Load type	EN 60947-5-1: DC-13
Short-circuit protection	yes
Potential separation	galvanic isolation to P1/P2 , voltages up to 500 VDC

Standard/Directive conformity

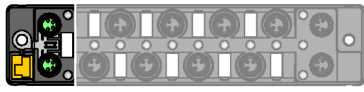
Vibration test	acceleration to 20 g acc. to EN 60068-2-6
Shock test	acc. to EN 60068-2-27
Drop and topple	acc. to EN 60068-2-31/IEC 60068-2-32
Electro-magnetic compatibility	acc. to EN 61131-2
Approvals and certificates	CE
UL conditions	cULus LISTED 21 W2, Encl.Type 1 IND.CONT.EQ.

General Information

Dimensions (W x L x H)	32 x 144 x 32mm
Operating temperature	-40...+70 °C
Storage temperature	-40...+85 °C
Altitude	max.5000 m
Protection class	IP65 IP67 IP69K
MTTF	264 years acc. to SN 29500 (Ed. 99) 20 °C
Housing material	PA6-GF30
Housing color	Black
Material label	Polycarbonate
Halogen-free	yes
Mounting	2 mounting holes □ 4.6 mm

Note the numbering of the IO range:
From firmware version 3.1.4.0 and higher slots C0 to C7 and channels CH0 to CH7 are counted. For more details on the corresponding change see manual.

Compact Multiprotocol I/O Module for Ethernet
4 Digital PNP Inputs and 4 Digital PNP Outputs 2 A
TBEN-S1-4DIP-4DOP



Accessories

It is strongly recommended to use only ready-made Ethernet cables!

Ethernet cable (example):

M8-M8:

PSGS4M-PSGS4M-4413-1M

Ident. no. U-55718

M8-RJ45:

PSGS4M-RJ45S-4413-1M

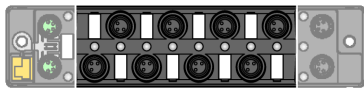
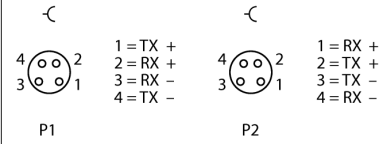
Ident. no.: U-55725

M8-M12:

RSSD-PSGS4M-4413-1M

Ident. no.: U-58840

M8 x 1 Ethernet



Accessories

Actuator and sensor cable/PUR cable (example):

M8 - open end

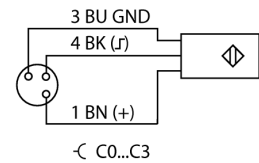
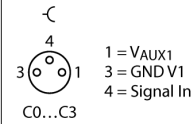
ID No. 6625562 PSG3M-2/TXL

M8-M8

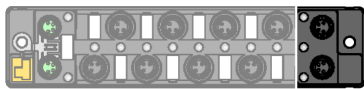
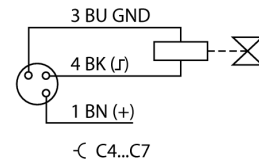
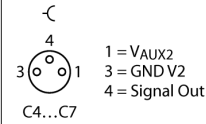
ID No. 6625665 PKG3M-0,3-PSG3M/TXL

ID No. 6627137 PKG3M-3-PSG3M/TXL

M8 x 1 Input



Output M8 x 1



Accessories

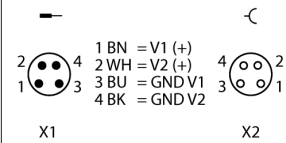
Power supply cable (example):

M8-M8 2 m

PKG 4M-2-PSG 4M

Ident. no. U99-10815

M8 x 1 Voltage Supply



Compact Multiprotocol I/O Module for Ethernet
4 Digital PNP Inputs and 4 Digital PNP Outputs 2 A
TBEN-S1-4DIP-4DOP



Industrial
Automation

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/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	Diagnostics disabled
	Red	ON	Diagnostics enabled V_2 undervoltage diagnosis is parameter-dependent
PWR	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 Status I/O

LED	Color	Status	Description
LED 0 ... 3	Green	ON	Input active
	Red	flashing	Overload of the power supply port. All LEDs of the affected group C0-C3 are flashing
		OFF	Input inactive
LED 4 ... 7	Green	ON	Output active
	Red	ON	Output active with overload/short circuit
		Flashing	Overload of the port supply. All LEDs of the affected group C4-C7 are flashing
		OFF	Output inactive
LED 7	White	Flashing	Blink/Wink command active

Compact Multiprotocol I/O Module for Ethernet

4 Digital PNP Inputs and 4 Digital PNP Outputs 2 A

TBEN-S1-4DIP-4DOP

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 according 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 according 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. Observe offset of respective protocol

Channel Assignment/Port/Pin:

Channel		-	-	-	-	-	-	-	-	-	Ch7	Ch6	Ch5	Ch4	Ch3	CH2	CH1	CH0
		-	-	-	-	-	-	-	-	-	DO7	DO6	DO5	DO4	DI3	DI2	DI1	DI0
Port		-	-	-	-	-	-	-	-	-	C7	C6	C5	C4	C3	C2	C1	C0
Pin		-	-	-	-	-	-	-	-	-	P4	P4	P4	P4	P4	P4	P4	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	Bit 3	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	Bit 3	Bit 2	Bit 1	Bit 0								
											MSB								LSB							
Digital Inputs	0x0000	0x0000	-	-	-	-	-	-	-	-	-	-	-	-	-	DI3	DI2	DI1	DI0							
Diagnostics	0x0001	0x0002	-	-	-	-	ERR3	ERR2	ERR1	ERR0	-	-	-	-	-	-	VERR V2	VERR V1								
																	CH47	CH03								
Latch input	0x0002	0x0004	-	-	-	-	-	-	-	-	-	-	-	-	DI3	DI2	DI1	DI0								
Counter Ch0	0x0003	0x0006	Counter value LSB																							
	0x0004	0x0008	Counter value MSB																							
Frequency Ch0	0x0005	0x000A	Frequency MSB										Frequency LSB													
Status	0x0006	0x000C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
PWM Diagnos- tics Ch3	0x0007	0x000E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
Module Status	0x0008	0x0010	-	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	Bit 3	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	Bit 3	Bit 2	Bit 1	Bit 0								
											MSB								LSB							
Digital Outputs	0x0000	0x0000	-	-	-	-	-	-	-	-	DO7	DO6	DO5	DO4	-	-	-	-								
Latch Reset	0x0001	0x0002	-	-	-	-	-	-	-	-	-	-	-	-	DI3	DI2	DI1	DI0								
Control	0x0002	0x0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CNT_								
																		ERR								
																		DIAG								

**Compact Multiprotocol I/O Module for Ethernet
4 Digital PNP Inputs and 4 Digital PNP Outputs 2 A
TBEN-S1-4DIP-4DOP**



Industrial
Automation

PWM Ch3	0x0003	0x0006	-	-	-	-	-	-	-	-	-	Duty cycle
---------	--------	--------	---	---	---	---	---	---	---	---	---	------------

Legend:

V1	Undervoltage V1	CFG	I/O configuration error
V2	Undervoltage V2	FCE	I/O-ASSISTANT Force Mode Active
Cx	Port x	Px	Pin x
Dlx	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
VAUXxPyCz	Overcurrent supply VAUXx Pin y Port z	CNT_RST	Counter reset