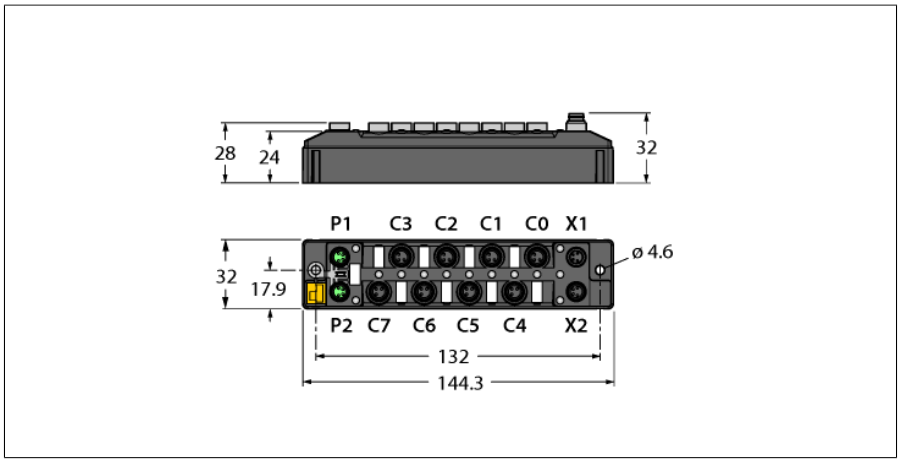
Compact Multiprotocol I/O Module for Ethernet 8 Universal Digital Channels, Configurable as PNP Inputs or 0.5A Outputs TBEN-S1-8DXP/CS30150



Type	TBEN-S1-8DXP/CS30150
ID	100002702

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 × M8, 4-pin
Operating current	V1: max. 150 mA
Sensor/actuator supply	Supply ports C0-C3 from V1 short-circuit proof, 0.5 A for group C0-C3
Sensor/actuator supply	Supply 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	10/100 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

Field Logic Controller (FLC)	
ARGEE Firmware Version	3.1.4.0
ARGEE Engineering Version	2.0.24.0

Modbus TCP	
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)

- Customer-specific module for USPS USS
- BEEP slave without initial DHCP-request
- 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
- ATEX Zone 2/22
- Input diagnostics per group
- Max. 0.5 A per output
- Output diagnostics per channel
- One freely selectable digital channel per port
- Max. 0.5A per output
- Output diagnostics per channel
- Programmable ARGEE

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Ethernet/IP	
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

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	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
Electrical isolation	Galvanically isolated to the fieldbus Voltage proof up 500 VDC

Digital outputs	
Number of channels	8
Connectivity outputs	M8, 3-pin
Output type	PNP
Type of output diagnostics	Channel diagnostics
Output voltage	24 VDC from potential group
Output current per channel	0.5 A, short-circuit resistance
Load type	EN 60947-5-1: DC-13
Short-circuit protection	yes
Electrical isolation	Galvanically isolated to the fieldbus Voltage proof up 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
Note on ATEX/IECEx	The Quick Start Guide with information on use in Ex Zones 2 and 22 must be observed.

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General Information	
Dimensions (W x L x H)	32 x 144 x 32 mm
Ambient temperature	-40…+70 °C
Storage temperature	-40…+85 °C
Altitude	Max. 5000 m
Protection class	IP65 IP67 IP69K
MTTF	248 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

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

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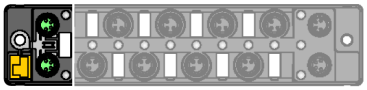
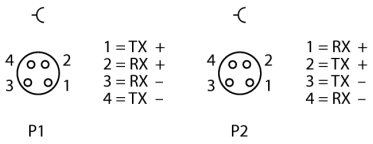
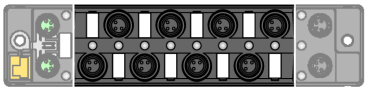


Accessories
It is strongly recommended to use only ready-made Ethernet cables!
Ethernet cable (example):
M8-M8:
PSGS4M-PSGS4M-4413-1M
Ident. no. U-55718
M8-RJ45:
PSGS4M-RJ45S-4413-1M
Ident. no.: U-55725
M8-M12:
RSSD-PSGS4M-4413-1M
Ident. no.: U-58840

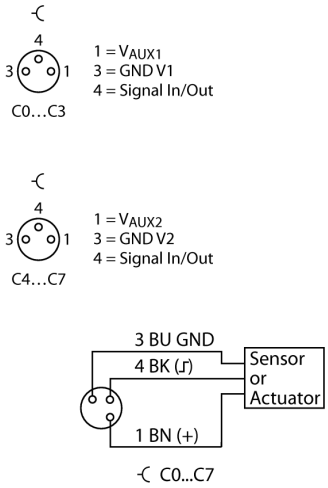
M8 × 1 Ethernet

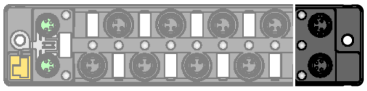




Accessories
Actuator and sensor cable/PUR connection cable (example):
M8 – open end
ID number 6625562 PSG3M-2/TXL
M8-M8
ID number 6625665 PKG3M-0,3-PSG3M/TXL
ID number 6627137 PKG3M-3-PSG3M/TXL

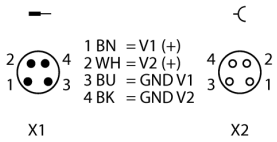
M8 × 1 I/O port





Accessories
Power supply cable (example):
M8-M8 2 m
PKG 4M-2-PSG 4M
Ident. no. U99-10815

M8 × 1 Power Supply



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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
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	Color	Status	Description
LED 0 … 7	Green	ON	Input or output active
	Red	ON	Output active with overload/short circuit
		Flashing	Overload of the port supply. All LEDs of the affected group C0-C3 or C4-C7 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/port/pin assignment:

Channel		-	-	-	-	-	-	-	-	Ch7	Ch6	Ch5	Ch4	Ch3	CH2	CH1	CH0
		-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0
Port Pin		-	-	-	-	-	-	-	-	C7 P4	C6 P4	C5 P4	C4 P4	C3 P4	C2 P4	C1 P4	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							
Digital inputs 8DIP	0x0000	0x0000	-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0
Diagnostics	0x0001	0x0002	ERR7	ERR6	ERR5	ERR4	ERR3	ERR2	ERR1	ERR0	-	-	-	-	-	-	VERR V2 CH47	VERR V1 CH03
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 8DXP	0x0000	0x0000	-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0
Latch reset	0x0001	0x0002	-	-	-	-	-	-	-	-	DX7	DX6	DX5	DX4	DX3	DX2	DX1	DX0

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Control	0x0002	0x0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	CNT_RST
PWM Ch3	0x0003	0x0006	-	-	-	-	-	-	-	-	Duty cycle							
PWM Ch7	0x0004	0x0008	-	-	-	-	-	-	-	-	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
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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