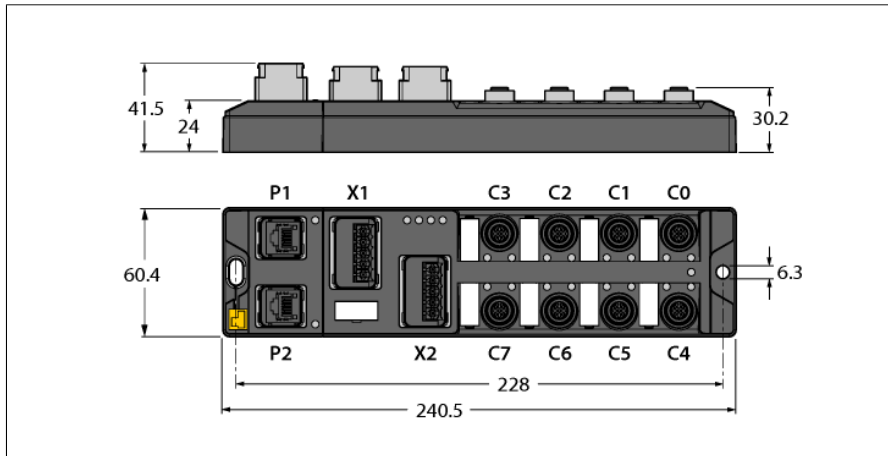


Compact AIDA I/O Module for Ethernet
16 Digital PNP Inputs
TBEN-A1-16DIP



- EtherNet/IP™, Modbus® TCP, or PROFINET® slave
- Integrated Ethernet switch
- Supports 10 Mbps / 100 Mbps
- 2 x M12, 4-pin, D-coded, Ethernet fieldbus connection
- Glass-fiber reinforced housing
- Shock and vibration tested
- Potted module electronics
- Protection classes IP67 / IP69K
- AIDA Power push-pull connector for power supply
- Input diagnostics per port

Type code	TBEN-A1-16DIP
Ident no.	6814013

Supply	
Supply voltage	24 VDC max. 12 A via AIDA connector max 9 A to I/O field
Sensor/Actuator supply V_{AUX1}	supply of ports C0-C7 from V1 short-circuit proof, 120 mA 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

Modbus TCP	
Addressing	Static IP, BOOTP, DHCP
Supported function codes	FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23
Number of TCP connections	8

EtherNet/IP™	
Addressing	acc. to EtherNet/IP™ specification
Quick Connect (QC)	< 150 ms
Device Level Ring (DLR)	supported
Number of TCP connections	3
Number of CIP connections	10

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

Compact AIDA I/O Module for Ethernet

16 Digital PNP Inputs

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Digital inputs

Number of channels	16
Connectivity inputs	M12, 5-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	2.5 ms
Potential separation	galvanic isolation to P1/P2 , voltages up to 500 VDC

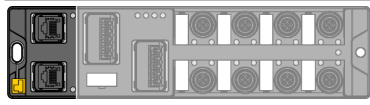
Standard/Directive conformity

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

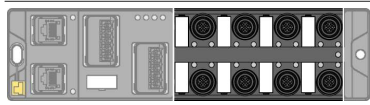
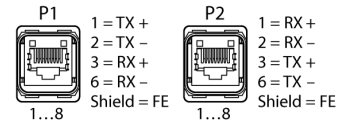
General Information

Dimensions (W x L x H)	60.4 x 240.5 x 42mm
Operating temperature	-40...+70 °C
Storage temperature	-40...+70 °C
Altitude	max.5000 m
Protection class	IP65 IP67 IP69K
MTTF	192 years
Housing material	PA6-GF30
Housing color	black
Halogen-free	yes
Mounting	2 mounting holes □ 6.3 mm

Compact AIDA I/O Module for Ethernet
16 Digital PNP Inputs
TBEN-A1-16DIP



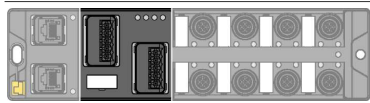
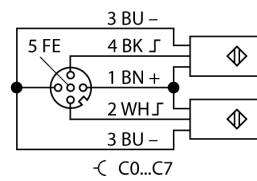
Ethernet RJ45



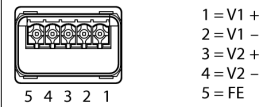
Note

Actuator and sensor cable / PUR connection cable (for example):
 RKC4.4T-2-RSC4.4T/TXL
 Ident. no. 6625608
 Y extension cable for single occupancy
 FSM4-2WAK3-1/1/P00
 Ident. no. 8009560

Input M12 x 1



Power Supply



Compact AIDA I/O Module for Ethernet
16 Digital PNP Inputs
TBEN-A1-16DIP

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	Ready
	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
PWR	Green	ON	Power supply V ₁ OK
		OFF	V ₁ power off or below defined tolerance

LED Status I/O

LED	Color	Status	Description
LED 0 ... 15	Green	ON	Input active
		flashing	Power overload at the corresponding port. Both port LEDs are flashing.
	OFF	Input inactive	

Compact AIDA I/O Module for Ethernet

16 Digital PNP Inputs

TBEN-A1-16DIP

Process Data Mapping of 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	DI15 C7P2	DI14 C7P4	DI13 C6P2	DI12 C6P4	DI11 C5P2	DI10 C5P4	DI9 C4P2	DI8 C4P4	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
I/O Diag (RO)	0xA000									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	1	-	FCE	-	-	CFG	COM	V1	-	V2	-	-	-	-	-	-	Diag Warn
Inputs	2	DI15 C7P2	DI14 C7P4	DI13 C6P2	DI12 C6P4	DI11 C5P2	DI10 C5P4	DI9 C4P2	DI8 C4P4	DI7 C3P2	DI6 C3P4	DI5 C2P2	DI4 C2P4	DI3 C1P2	DI2 C1P4	DI1 C0P2	DI0 C0P4
Diag 1	3	-	-	Sched Diag	-	-	-	-	-	-	-	-	-	-	-	-	I/O Diag
Diag 2	4									SCS7	SCS6	SCS5	SCS4	SCS3	SCS2	SCS1	SCS0

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	1	-	FCE	-	-	CFG	COM	V1	-	V2	-	-	-	-	-	-	Diag Warn
Inputs	2	DI15 C7P2	DI14 C7P4	DI13 C6P2	DI12 C6P4	DI11 C5P2	DI10 C5P4	DI9 C4P2	DI8 C4P4	DI7 C3P2	DI6 C3P4	DI5 C2P2	DI4 C2P4	DI3 C1P2	DI2 C1P4	DI1 C0P2	DI0 C0P4
Diag 1	3																I/O Diag

PROFINET Process Data

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Inputs	0	DI7 C3P2	DI6 C3P4	DI5 C2P2	DI4 C2P4	DI3 C1P2	DI2 C1P4	DI1 C0P2	DI0 C0P4
	1	DI15 C7P2	DI14 C7P4	DI13 C6P2	DI12 C6P4	DI11 C5P2	DI10 C5P4	DI9 C4P2	DI8 C4P4

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