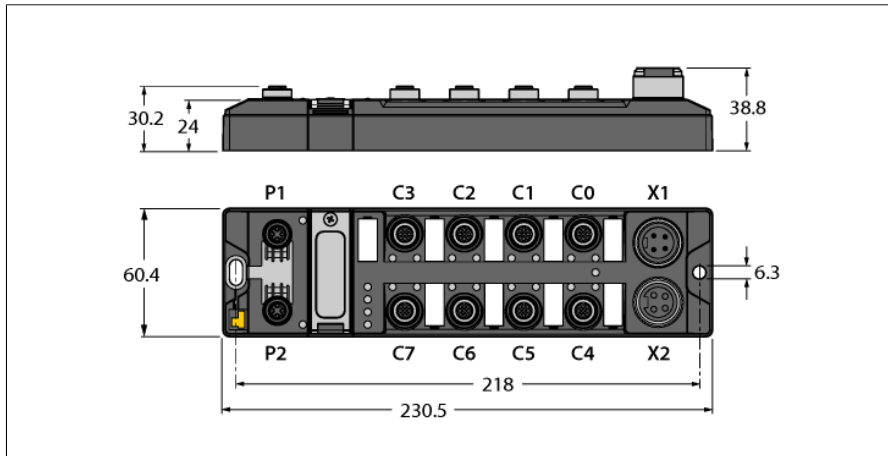


Compact Multiprotocol I/O Module for Ethernet

16 Digital PNP 2-A Outputs

TBEN-LF-16DOP



- Ford VOME IP address loaded
- Ford VOME specific firmware
- IP address 136.129.1.xxx
- EtherNet/IP™ device
- Integrated Ethernet switch
- Supports 10 Mbps/100 Mbps
- 2x M12, 4-pin, D-coded, Ethernet fieldbus connection
- Glass fiber reinforced housing
- Shock and vibration tested
- Fully potted module electronics
- Protection classes IP65, IP67, IP69K
- Max. 2 A per output
- Output diagnostics per channel

Type designation	TBEN-LF-16DOP
Ident-No.	100003915
Sensor/Actuator supply V_{AUX2}	supply of ports C0-C7 from V2 short-circuit proof, 120 mA per port
System data	
Fieldbus transmission rate	10 Mbps/100 Mbps
Fieldbus connection technology	2 x M12, 4-pin, D-coded
Fieldbus address range	0 (136.129.1.254)
Protocol detection	automatic
Service interface	Ethernet via P1 or P2
Ethernet/IP	
Addressing	acc. to EtherNet/IP specification
Quick Connect (QC)	< 150 ms
Device Level Ring (DLR)	supported
Class 3 connections (TCP)	3
Class 1 connections (CIP)	10
Input Assembly Instance	101
Output Assembly Instance	102
Configuration Assembly Instance	106
Digital outputs	
Number of channels	16
Connectivity outputs	M12, 5-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, max. 2.0 A per port
Output delay	1.3 ms
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	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
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.

Compact Multiprotocol I/O Module for Ethernet

16 Digital PNP 2-A Outputs

TBEN-LF-16DOP

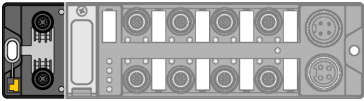
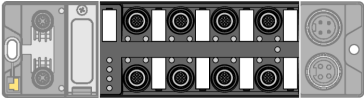
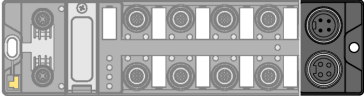
General Information

Dimensions (W x L x H)	60.4 x 230.4 x 39mm
Operating temperature	-40...+70 °C
Storage temperature	-40 °C ... +85 °C
Altitude	max. 5000 m
Protection class	IP65 IP67 IP69K
Housing material	PA6-GF30
Housing color	Black
Window material	Lexan
Material screw	303 stainless steel
Material label	Polycarbonate
Halogen-free	yes
Mounting	2 mounting holes □ 6.3 mm

Compact Multiprotocol I/O Module for Ethernet

16 Digital PNP 2-A Outputs

TBEN-LF-16DOP

	Accessories	M12 x 1 Ethernet 1 2 3 4 1 = TX + 2 = RX + 3 = TX - 4 = RX - flange = FE 1 2 3 4 1 = RX + 2 = TX + 3 = RX - 4 = TX - flange = FE P1 P2
	Accessories	M12 x 1 Output 1 2 3 4 5 1 = Vaux2 2 = Signal Out 3 = GND V2 4 = Signal Out 5 = FE C0...C7
	Accessories	7/8" Power Supply 1 2 3 4 1 = 24 VDC V2 2 = 24 VDC V1 3 = GND V1 4 = GND V2 X1 3 4 1 2 1 = 24 VDC V2 2 = 24 VDC V1 3 = GND V1 4 = GND V2 X2

Compact Multiprotocol I/O Module for Ethernet

16 Digital PNP 2-A Outputs

TBEN-LF-16DOP

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	Device ready for operation
	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
ERR	Green	On	No diagnostic message
	Red	On	Diagnostic message pending
PWR	Green	ON	V ₁ and V ₂ OK
		OFF	V ₁ power off or below defined tolerance of 18 V
		Flashing	V ₂ missing or < 18 V

LED Status I/O

LED	Color	Status	Description
LED 0 ... 15	Green	ON	Output active
	Red	ON	Output active with overload/short circuit
		Flashing	Power overload at the corresponding port. Both port LEDs are flashing.
		OFF	Output inactive

Compact Multiprotocol I/O Module for Ethernet

16 Digital PNP 2-A Outputs

TBEN-LF-16DOP

Process Data Mapping of the Single Protocols

For more details on the corresponding protocols see manual.

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	0	-	FCE	-	-	CFG	COM	V1	-	V2	-	-	-	-	-	-	Diag Warn
Diag 1	1	-	-	Sched Diag	-	-	-	-	-	-	-	-	-	-	-	-	I/O Diag
Diag 2	2	SC07	SC06	SC05	SC04	SC03	SC02	SC01	SC00	SCS7	SCS6	SCS5	SCS4	SCS3	SCS2	SCS1	SCS0
Diag 3	3	-	-	-	-	-	-	-	-	SCO15	SCO14	SCO13	SCO12	SCO11	SCO10	SCO9	SCO8
Output data (scanner -> station)																	
Control	0	Reserved															
Outputs	1	DO15 C7P2	DO14 C7P4	DO13 C6P2	DO12 C6P4	DO11 C5P2	DO10 C5P4	DO9 C4P2	DO8 C4P4	DO7 C3P2	DO6 C3P4	DO5 C2P2	DO4 C2P4	DO3 C1P2	DO2 C1P4	DO1 C0P2	DO0 C0P4

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	0	-	FCE	-	-	CFG	COM	V1	-	V2	-	-	-	-	-	-	Diag Warn
Diag 1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I/O Diag
Output Data (Scanner -> Station)																	
Control	0	Reserved															
Outputs	1	DO15 C7P2	DO14 C7P4	DO13 C6P2	DO12 C6P4	DO11 C5P2	DO10 C5P4	DO9 C4P2	DO8 C4P4	DO7 C3P2	DO6 C3P4	DO5 C2P2	DO4 C2P4	DO3 C1P2	DO2 C1P4	DO1 C0P2	DO0 C0P4

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