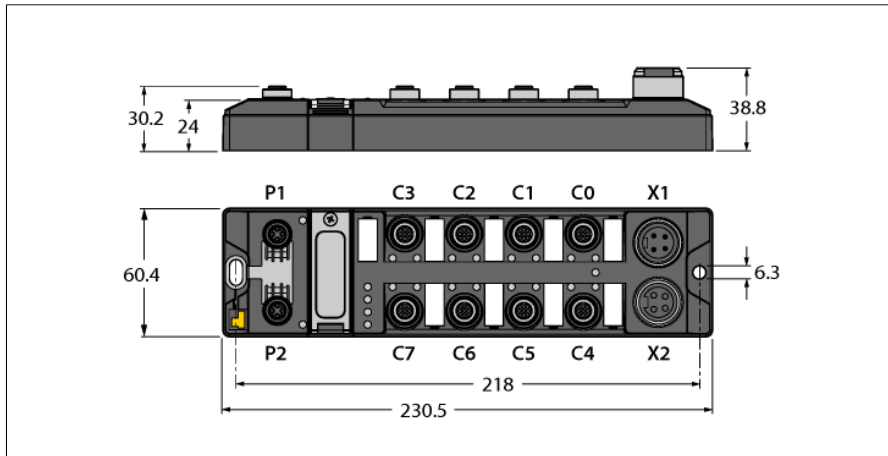


Compact Multiprotocol I/O Module for Ethernet

16 digital NPN inputs

TBEN-L4-16DIN



- 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
- Fully potted module electronics
- Protection classes IP65, IP67, IP69K
- 7/8" connector for power supply, 4-pin
- Input diagnostics per port
- FLC/ARGEE programmable

| | |
|-------------------------|---------------|
| Type designation | TBEN-L4-16DIN |
| Ident-No. | 6814061 |

| | |
|--|--|
| Supply | |
| Supply voltage | 24 VDC |
| Admissible range | 18...30 VDC |
| | Total current max. 9 A per voltage group V1 |
| Voltage supply connection | 4-pin male 7/8" connector X1 |
| 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 |

| | |
|-------------------------------------|----------|
| Field Logic Controller (FLC) | |
| Supported from firmware version | 3.2.9.0 |
| 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) | < 150 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 |

| | |
|---------------------------------|---------------------------------|
| 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 Multiprotocol I/O Module for Ethernet

16 digital NPN inputs

TBEN-L4-16DIN

TURCK
works

Industrial
Automation

Digital inputs

| | |
|---------------------------|---|
| Number of channels | 16 |
| Connectivity inputs | M12, 5-pin |
| Input type | NPN |
| 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 |

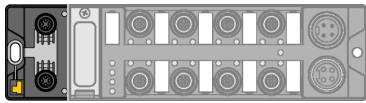
Standard/Directive conformity

| | |
|--------------------------------|--|
| 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 |
| Approvals and certificates | CE |
| UL conditions | cULus LISTED 21 W2, Encl.Type 1 IND.CONT.EQ. |

General Information

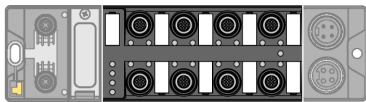
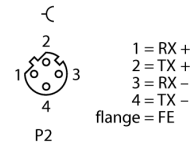
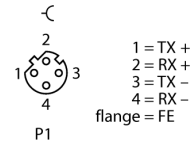
| | |
|------------------------|---------------------------|
| Dimensions (W x L x H) | 60.4 x 230.4 x 39mm |
| Operating temperature | -40...+70 °C |
| Storage temperature | -40...+85 °C |
| Altitude | max.5000 m |
| Protection class | IP65 IP67 IP69K |
| Housing material | PA6-GF30 |
| Housing color | 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 NPN inputs
TBEN-L4-16DIN



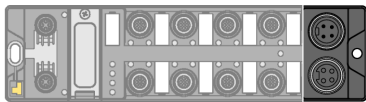
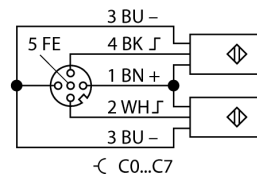
Accessories
 Ethernet cable (example):
 RSSD RSSD 441-2M
 Ident no. U-02482

M12 x 1 Ethernet



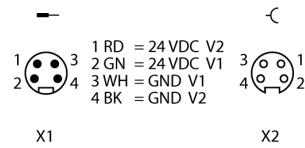
Accessories
 Accessories:
 Connection cable , 2-channel (example):
 RK 4.4T-2-RS 4.4T
 Ident no. U2445
 Splitter, 1-channel (example):
 YB2-FSM 4.5-2FKM 4.5
 Ident no. U0875-78

M12 x 1 Input



Accessories
 Power supply cable (example):
 RSM RKM 40-2M
 Ident no. U2280-0

7/8" Power Supply



Compact Multiprotocol I/O Module for Ethernet
16 digital NPN inputs
TBEN-L4-16DIN



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 |
| | Green/red | Alternating | Autonegotiation and/or waiting for DHCP/Boot-P addressing |
| | OFF | Power off | |
| ERR | Green | ON | Diagnostics disabled |
| | Red | ON | Diagnostics enabled V_1 undervoltage diagnosis is parameter-dependent |
| PWR | Green | ON | Power supply V_1 OK |
| | | OFF | V_1 power off or below defined tolerance of 18 V |

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 Multiprotocol I/O Module for Ethernet

16 digital NPN inputs

TBEN-L4-16DIN

Process Data Mapping of the 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 | 0 | - | FCE | - | - | CFG | COM | V1 | - | V2 | - | - | - | - | - | - | Diag Warn |
| Inputs | 1 | 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 | 2 | - | - | Sched Diag | - | - | - | - | - | - | - | - | - | - | - | - | I/O Diag |
| Diag 2 | 3 | | | | | | | | | 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 | 0 | - | FCE | - | - | CFG | COM | V1 | - | V2 | - | - | - | - | - | - | Diag Warn |
| Inputs | 1 | 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 | 2 | | | | | | | | | | | | | | | | 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 | DI8 C4P2 | DI7 C4P4 | DI6 C3P2 | DI5 C3P4 | DI4 C2P2 | DI3 C2P4 | DI2 C1P2 | DI1 C1P4 |
| | 1 | DI16 C8P2 | DI15 C8P4 | DI14 C7P2 | DI13 C7P4 | DI12 C6P2 | DI11 C6P4 | DI10 C5P2 | DI9 C5P4 |

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 |