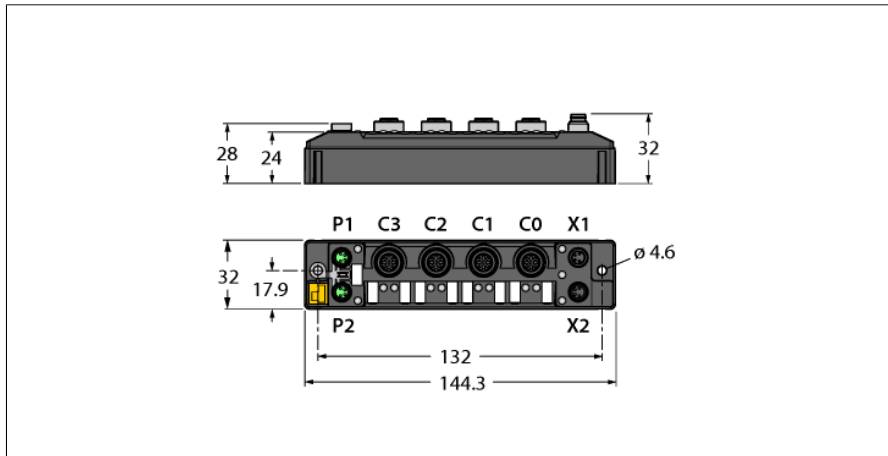


Compact Multiprotocol I/O Module for Ethernet

2 Configurable Serial Interfaces and 4 Universal Digital Channels

TBEN-S2-2COM-4DXP



- 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
- Two serial ports can be selected as RS485 or RS232
- Up to eight Modbus RTU master integrated per serial interface
- Four freely selectable digital channels as input or output
- Male M8, 4-pin, for power supply
- Separated power groups for safety shutdown

| | |
|--|--|
| Type designation | TBEN-S2-2COM-4DXP |
| Ident-No. | 6814031 |
| 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 |
| Sensor/Actuator supply V _{AUX1} | Ports C0-C1 powered by V1 |
| | Short-circuit proof, 24 V:1.2 A; 5 V:0.5 A per port |
| Sensor/Actuator supply V _{AUX2} | Ports C2-C3 powered by V2 |
| | Short-circuit proof, 0.14 A 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 × M8, 4-pin |
| 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 |
| 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 |
| 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 |

Compact Multiprotocol I/O Module for Ethernet

2 Configurable Serial Interfaces and 4 Universal Digital Channels

TBEN-S2-2COM-4DXP

TURCK
works

Industrial
Automation

Serial interface

| | |
|--------------------|----------------|
| Signal type | RS232 or RS485 |
| Number of channels | 2 |

Operating mode RS232

| | |
|----------------------|---|
| Signal low level | -18 to -3 VDC |
| Signal high level | 3 to 18 VDC |
| Transmission signals | TxD, RxD |
| Transmission rate | 300 to 230400 bps |
| Transmission type | Full duplex |
| Cable length | 15 m at 19200 Bd (max. line capacitance < 2000 pF) |

Operating mode RS485

| | |
|----------------------|---------------------------|
| Transmission signals | TX/RX+, TX/RX- |
| Transmission rate | 300 to 230400 bps |
| Transmission type | 2-wire half duplex |
| Terminating resistor | Internal or external |
| Biasing | Internal or external |
| Line impedance | 120 Ω |
| Cable length | twisted pair up to 1000 m |

Digital inputs

| | |
|---------------------------|---|
| Number of channels | 4 |
| Connectivity inputs | M12, 5-pin |
| Input type | PNP |
| Type of input diagnostics | channel 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 | 0.05 ms |
| Potential separation | galvanic isolation to P1/P2 , voltages up to 500 VDC |

Digital outputs

| | |
|-------------------------------|---|
| Number of channels | 4 |
| Connection Technology Outputs | M12, 5-pol |
| 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 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 |

Compact Multiprotocol I/O Module for Ethernet

2 Configurable Serial Interfaces and 4 Universal Digital Channels

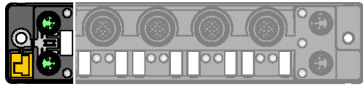
TBEN-S2-2COM-4DXP



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 | 179 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 |

Compact Multiprotocol I/O Module for Ethernet
2 Configurable Serial Interfaces and 4 Universal Digital Channels
TBEN-S2-2COM-4DXP



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

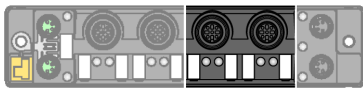
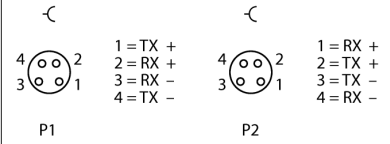
Ident. no.: U-55725

M8-M12:

RSSD-PSGS4M-4413-1M

Ident. no.: U-58840

M8 x 1 Ethernet



Accessories

General information on the modes of operation:

Factory setting: Operating Mode: RS485

Operating Mode: RS485

RS485 cable (example):

Ident. no. 7030331 RK4.5T-2-RS4.5T/S2503 length: 2 m

Ident. no. 7030332 RK4.5T-5-RS4.5T/S2503 length: 5 m

RS485 splitter:

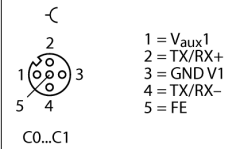
Ident. no 6622101 FSM-2FKM57

RS485 terminating resistor:

Ident. no. 3094520 EZL-RTM-M male connector

Ident. no. 3094529 EZL-RTM-F female connector

M12 x 1 I/O Port

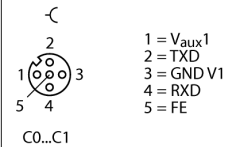


Operating Mode: RS232

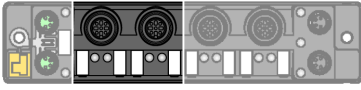
RS232 cable (example):

t.b.d.

M12 x 1 I/O Port



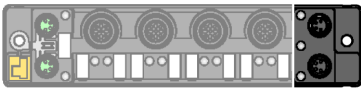
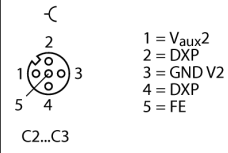
Compact Multiprotocol I/O Module for Ethernet
2 Configurable Serial Interfaces and 4 Universal Digital Channels
TBEN-S2-2COM-4DXP



Accessories

Actuator and sensor cable/PUR cable (example):
 ID number 6625608 RKC4.4T,RSC4.4T/TXL
 Y extension cable for single occupancy
 M12 – M12 6628197 VBRS4.4-2RKC4T-0,3/0,3/TEL
 M12 – M86630443 VBRS4.4-2PKG3S-0,3/0,3/TEL

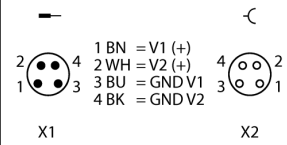
M12 x 1 I/O Port



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
2 Configurable Serial Interfaces and 4 Universal Digital Channels
TBEN-S2-2COM-4DXP



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 ₁ 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 TxD | Green | Flashing | Data being sent |
| LED RxD | Green | Flashing | Data is being received |
| | | Red | Flashing |
| | Red | On | Buffer overflow received data |
| LED TxD and RxD | Red | Simultaneously flashing | Overload of the power supply slot. Both LEDs of the corresponding port are flashing simultaneously. |
| | | Alternately flashing | Configuration error. Both LEDs of the corresponding port are flashing alternately. |
| DXP 4...7 | Green | ON | Input or output active |
| | | Red | ON |
| | | Flashing | Overload of the port supply. Both LEDs of the corresponding port are flashing. |
| | | OFF | Input or output inactive |
| DXP 7 | White | Flashing | Blink/Wink command active |

Compact Multiprotocol I/O Module for Ethernet

2 Configurable Serial Interfaces and 4 Universal Digital Channels

TBEN-S2-2COM-4DXP

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, offset of the respective protocol is to be observed.

Channel Assignment/Port/Pin:

| | | | | | | | | | | | | | | | | | | |
|---------|--|---|---|---|---|---|---|---|---|---|------|------|------|------|---|---|---|---|
| Channel | | - | - | - | - | - | - | - | - | - | Ch7 | Ch6 | Ch5 | Ch4 | - | - | - | - |
| | | - | - | - | - | - | - | - | - | - | DI7 | DI6 | DI5 | DI4 | - | - | - | - |
| Port | | - | - | - | - | - | - | - | - | - | C3P2 | C3P4 | C2P2 | C2P4 | - | - | - | - |
| Pin | | | | | | | | | | | | | | | | | | |

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 | | | | | | | | |
| COM0 | 0x0000 | 0x0000 | - | | | | | | | | | Status *1) | | | | | | | | |
| COM0 | 0x0001 | 0x0002 | - | | | | | | | | | RXFL *2) | | | | | | | | |
| COM0 | 0x0002 | 0x0004 | UCT MSB *2) | | | | | | | | | UCT LSB *2) | | | | | | | | |
| COM0 | 0x0003 | 0x0006 | Input | | | | | | | | | | | | | | | | | |
| Data | ... | ... | Byte 0...23, 0x00...0x17 | | | | | | | | | | | | | | | | | |
| Block 1 | 0x000E | 0x001D | | | | | | | | | | | | | | | | | | |
| COM0 | ... | | ... | | | | | | | | | | | | | | | | | |
| Block 2...7 | | | | | | | | | | | | | | | | | | | | |
| COM0 | 0x0057 | 0x00AF | Input | | | | | | | | | | | | | | | | | |
| Data | ... | ... | Byte 168...191, 0xA8...0xBF | | | | | | | | | | | | | | | | | |
| Block 8 | 0x0062 | 0x00C5 | | | | | | | | | | | | | | | | | | |
| COM1 | 0x0063 | 0x00C6 | - | | | | | | | | | Status *1) | | | | | | | | |
| COM1 | 0x0064 | 0x00C8 | - | | | | | | | | | RXFL *1) | | | | | | | | |
| COM1 | 0x0065 | 0x00CA | UCT MSB *2) | | | | | | | | | UCT LSB *2) | | | | | | | | |
| COM1 | 0x0066 | 0x00CC | Input | | | | | | | | | | | | | | | | | |
| Data | ... | ... | Byte 0...23, 0x00...0x17 | | | | | | | | | | | | | | | | | |
| Block 1 | 0x0071 | 0x00E2 | | | | | | | | | | | | | | | | | | |
| COM1 | ... | | ... | | | | | | | | | | | | | | | | | |
| Block 2 ... Block 7 | | | | | | | | | | | | | | | | | | | | |
| COM1 | 0x00BA | 0x0175 | Input | | | | | | | | | | | | | | | | | |
| Data | ... | ... | Byte 168...191, 0xA8...0xBF | | | | | | | | | | | | | | | | | |
| Block 8 | 0x00C5 | 0x18B | | | | | | | | | | | | | | | | | | |

Compact Multiprotocol I/O Module for Ethernet

2 Configurable Serial Interfaces and 4 Universal Digital Channels

TBEN-S2-2COM-4DXP

| | | | | | | | | | | | | | | | | | | | | |
|------------------------|--------|--------|------------------|------|------|------|---|-----|----|---|------------------|----|---------------|---------------|-----|-----|---|---|---|------|
| COM0 | 0x00C6 | 0x018C | MBS Error *2) | | | | | | | | Diag | | | | | | | | | |
| COM1 | 0x00C7 | 0x018E | MBS Error *2) | | | | | | | | Diag | | | | | | | | | |
| COM0 *2) | 0x00C8 | 0x0190 | SCB 1 Status MSB | | | | | | | | SCB 1 Status LSB | | | | | | | | | |
| | ... | ... | SCB 8 Status MSB | | | | | | | | SCB 8 Status LSB | | | | | | | | | |
| COM1 *2) | 0x00D0 | 0x01A0 | SCB 1 Status MSB | | | | | | | | SCB 1 Status LSB | | | | | | | | | |
| | 0x00D7 | 0x01AE | SCB 8 Status MSB | | | | | | | | SCB 8 Status LSB | | | | | | | | | |
| COM0 *2) | 0x00D8 | 0x01B0 | MEXT SCB1 MSB | | | | | | | | MEXT SCB1 MSB | | | | | | | | | |
| | ... | ... | MEXT SCB8 MSB | | | | | | | | MEXT SCB8 MSB | | | | | | | | | |
| COM1 *2) | 0x00E0 | 0x01C0 | MEXT SCB1 MSB | | | | | | | | MEXT SCB1 MSB | | | | | | | | | |
| | ... | ... | MEXT SCB8 MSB | | | | | | | | MEXT SCB8 MSB | | | | | | | | | |
| 4DXP Digital Inputs | 0x00E8 | 0x01D0 | - | - | - | - | - | - | - | - | - | - | DI7 | DI6 | DI5 | DI4 | - | - | - | - |
| 4DXP Diagnostics | 0x00E9 | 0x01D2 | ERR7 | ERR6 | ERR5 | ERR4 | - | - | - | - | - | - | VERR V2C67 | VERR V2C45 | - | - | - | - | - | - |
| Module Status | 0x00EA | 0x01D4 | - | 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 | | | | | | | | | | | |
| COM0 | 0x0000 | 0x0000 | - | | | | | | | | Control Bits *1) | | | | | | | | | |
| COM0 | 0x0001 | 0x0002 | - | | | | | | | | TXFL *1) | | | | | | | | | |
| COM0 | 0x0002 | 0x0004 | - | | | | | | | | RXLC *1) | | | | | | | | | |
| COM0 Data Block 1 | 0x0003 ... 0x000E | 0x0006 ... 0x001C | Output Byte 0...23, 0x00...0x17 | | | | | | | | | | | | | | | | | |
| COM0 Block 2...7 | ... | ... | ... | | | | | | | | | | | | | | | | | |
| COM0 Data Block 8 | 0x0057 ... 0x0062 | 0x00AE ... 0x00C4 | Output Byte 168...191, 0xA7...0xBF | | | | | | | | | | | | | | | | | |
| COM1 | 0x0063 | 0x00C6 | - | | | | | | | | Control Bits *1) | | | | | | | | | |
| COM1 | 0x0064 | 0x00C8 | - | | | | | | | | TXFL *1) | | | | | | | | | |
| COM1 | 0x0065 | 0x00CA | - | | | | | | | | RXFL *1) | | | | | | | | | |
| COM0 Data Block 1 | 0x0066 ... 0x0071 | 0x00CC ... 0x00E2 | Output Byte 0...23, 0x00...0x17 | | | | | | | | | | | | | | | | | |
| COM0 Block 2...7 | ... | ... | ... | | | | | | | | | | | | | | | | | |
| COM0 Data Block 8 | 0x00BA ... 0x00C5 | 0x0175 ... 0x018A | Output Byte 168...191, 0xA7...0xBF | | | | | | | | | | | | | | | | | |
| 4DXP Digital Outputs | 0x00C6 | 0x018C | - | - | - | - | - | - | - | - | - | - | DO7 | DO6 | DO5 | DO4 | - | - | - | - |

Key:

| | | | |
|-----------|--|-------|---------------------------------|
| 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 |
| VERRV2Cxy | Overcurrent supply VAUX1 channel x and y | | |
| RXFL | Received Frame Length | TXFL | Transmit Frame Length |
| RXLC | Receive Frame Length | | |
| UCT | MODBUS Server Cycle Time | MEXT | MODBUS Server Timing |
| SCB | MODBUS Server Configuration Block | MBS | MODBUS Server |
| *1) | Data valid for RS Raw mode | | |
| *2) | Data valid for Modbus RTU mode | | |

For more details on status and diagnosis bits see manual.