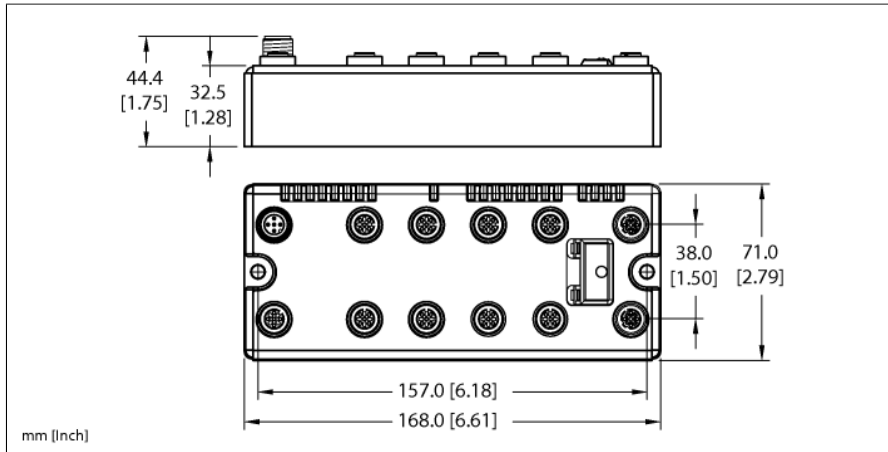


BL compact™ multiprotocol fieldbus station for Industrial Ethernet

8 IO-Link Channels

BLCEN-8M12LT-4IOL-4IOL



| | |
|--------------------------------|--|
| ID | 6811500 |
| Nominal system voltage | 24 VDC |
| System power supply | Via auxiliary power |
| Voltage supply connection | 2 x M12, 5-pin |
| Admissible range Vi | 20...30 VDC |
| Nominal current Vi | 205 mA |
| Max. current Vi | 2 A |
| Admissible range Vo | 20...30 VDC |
| Nominal current Vo | 160 mA |
| Max. current Vo | 4 A |
| Fieldbus transmission rate | 10/100 Mbps |
| Adjustment transmission rate | Automatic detection |
| Fieldbus address range | 1...92 0 (192.168.1.254) 93 (BOOTP) 94 (DHCP) 95 (PGM) 96 (PGM-DHCP) *recommended for PROFINET 97...98 (manufacturer specific) |
| Fieldbus addressing | 2 decimally coded rotary switches |
| Fieldbus connection technology | 2 x M12 4-pole, D-coded |
| Protocol detection | automatic |
| Web server | Integrated |
| Service interface | Ethernet |
| Vendor ID | 48 |
| Product type | 12 |
| Product code | 11500 |

- On-machine Compact fieldbus I/O block
- EtherNet/IP™, Modbus® TCP, or PROFINET slave
- Integrated Ethernet Switch
- 10 Mbps / 100 Mbps supported
- Two 4-pole M12, D-coded, connectors for fieldbus connection
- 2 rotary switches for node address
- IP67, IP69K
- M12 I/O connectors
- LEDs indicating status and diagnostics
- Electronics galvanically separated from the field level via optocouplers

| Modbus TCP | |
|-------------------------------|--|
| Addressing | Static IP, BOOTP, DHCP |
| Supported function codes | FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23 |
| Number of TCP connections | 6 |
| Input Data Size | max. 18 register |
| Input register start address | 0 (0x0000 hex) |
| Output Data Size | max. 16 register |
| Output register start address | 2048 (0x0800 hex) |

| Ethernet/IP | |
|---------------------------------|-----------------------------------|
| Addressing | acc. to EtherNet/IP specification |
| Device Level Ring (DLR) | supported |
| Class 1 connections (CIP) | 6 |
| Input Assembly Instance | 103 |
| Input Data Size | 21 INT |
| Output Assembly Instance | 104 |
| Output Data Size | 16 INT |
| Configuration Assembly Instance | 106 |
| Configuration Size | 0 |
| Comm Format | Data - INT |

| PROFINET | |
|---------------------------------|---------------------------------|
| Addressing | DCP |
| Conformance class | B (RT) |
| MinCycleTime | 1 ms |
| Diagnostics | acc. to PROFINET alarm handling |
| Topology detection | supported |
| Automatic addressing | supported |
| Media Redundancy Protocol (MRP) | supported |
| Input Data Size | max. 32 BYTE |
| Output Data Size | max. 32 BYTE |

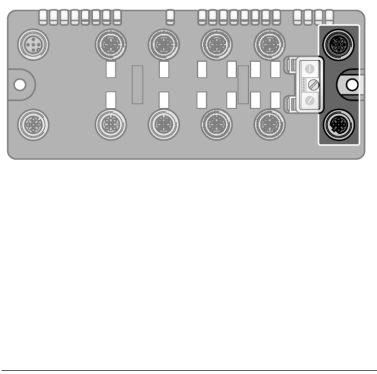
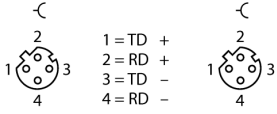
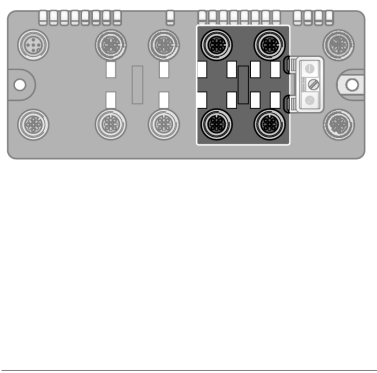
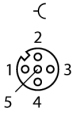
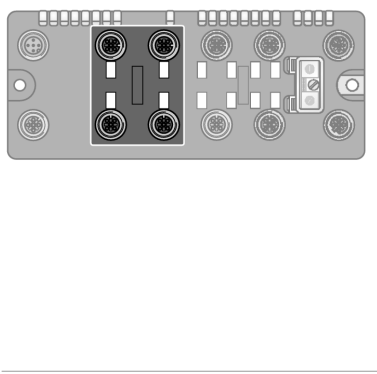
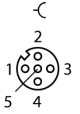
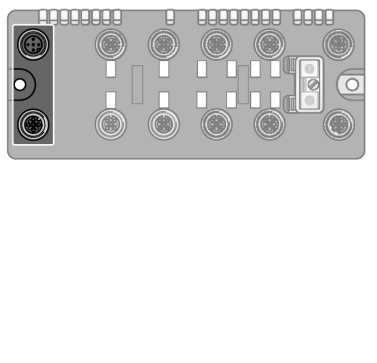
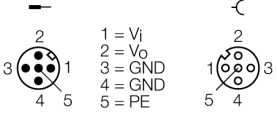
| Digital inputs | |
|---------------------------|-------------------------------------|
| Input type | PNP |
| Low-level signal voltage | < 5 V |
| High level signal voltage | > 11 V |
| Low level signal current | < 1.5 mA DI / < 5mA SIO |
| High level signal current | 2.1 ... 3.7 mA DI / 5 ... 11 mA SIO |

| Digital outputs | |
|-------------------------------------|---------------------------------|
| Output type | PNP |
| Sensor supply (V_{SENS}) | 24 VDC |
| Output current per channel | 0.5 A |
| Output voltage | 24 VDC |
| Output delay | 3 ms |
| Load type | resistive, inductive, lamp load |
| Load resistance, resistive | > 48 Ω |
| Load resistance, inductive | < 1.2 H |
| Lamp load | < 3 W |
| Switching frequency, resistive | < 200 Hz |
| Switching frequency, inductive | < 2 Hz |
| Switching frequency, lamp load | < 20 Hz |
| Short-circuit protection | yes |

| Technology | |
|----------------------|---|
| Signal type | IO-Link |
| Electrical isolation | isolation of electronics and field level via optocouplers |

| | |
|-----------------------------------|--|
| Dimensions | 168 x 71 x 32.5 mm |
| Mounting | 2 × 5.4 mm diameter holes, 1.7 Nm torque |
| Weight | 620 ± 20 g |
| Housing material | Glass-filled nylon, nickel plated brass connectors |
| Housing color | Black |
| Material screw | Nickel-plated brass |
| Material label | Polyester with polycarbonate overlay |
| Ground label material | Nickel plated brass |
| Protection class | IP67 IP69K |
| Ambient temperature | -40...+70 °C |
| Storage temperature | -40...+85 °C |
| Relative humidity | 15 to 95% (non-condensing) |
| Vibration test | Acc. to IEC 61131-2 |
| - up to 20 g (at 10 up to 150 Hz) | For mounting on base plate or machinery |
| Shock test | according to IEC 61131-2 |
| Electromagnetic compatibility | Acc. to IEC 61131-2 |
| MTTF | 92 years |
| MTTF note | acc. to SN 29500 (Ed. 99) 20 °C |
| Approvals and certificates | CE, cULus, Class I Div.2 |

Pinning and wiring diagram

| | | |
|---|---|---|
|  | <p>Ethernet Fieldbus cable (IP67 example): RSSD RSSD 441-2M ID number U-02482 or RSSD-RSSD-441-2M/S2174 ID number 6914218</p> | <p>Pin assignment (M12, D-coded)</p>  <p>1 = TD + 2 = RD + 3 = TD - 4 = RD -</p> |
|  | <p>Slot 1: IO-Link Channels Extension cable (example): RK 4.4T-2-RS 4.4T ident-no. U2445 or RKC4.4T-2-RSC4.4T/TEL ident-no. 6625208</p> | <p>Pin Assignment</p>  <p>1 = VSENS 2 = XSG 3 = GND 4 = C/Q 5 = PE</p> |
|  | <p>Slot 2: IO-Link Channels See slot 1</p> | <p>Pin Assignment</p>  <p>1 = VSENS 2 = XSG 3 = GND 4 = C/Q 5 = PE</p> |
|  | <p>Auxiliary Power Extension cable (example): RKC 4.4T-2-RSC 4.4T ident-no. U5264 or RKC4.4T-2-RSC4.4T/TEL ident-no. 6625208</p> | <p>Pin Assignment</p>  <p>1 = V_I 2 = V_O 3 = GND 4 = GND 5 = PE</p> |

Station LED status

| LED | Color | Status | Description |
|---------|--------|-------------------|---------------------------------|
| IOs | | OFF | No power |
| | RED | ON | Low power or station error |
| | RED | FLASHING (1 Hz) | I/O module configuration error |
| | RED | FLASHING (4 Hz) | No I/O module bus communication |
| | GREEN | ON | Station ok |
| | GREEN | FLASHING | Force mode active |
| BUS | | OFF | Power Off |
| | GREEN | ON | Connected to Master |
| | GREEN | FLASHING | Ready |
| | GREEN | FLASHING 3x (1Hz) | ARGEE Running |
| | RED | ON | Error |
| | RED | FLASHING | WINK |
| | YELLOW | ON | DHCP/BOOTP Search |
| LNK/ACT | | OFF | No Link |
| | GREEN | ON | Link |
| | GREEN | FLASHING | Traffic |
| | YELLOW | ON | 100 Mbit Linked |

I/O LED status slot 1

| LED | Color | Status | Description |
|---|-------|------------------|--|
| D1 * | | OFF | No diagnostics active |
| | RED | ON | Station error/ module bus communication failure |
| | RED | FLASHING (0.5Hz) | Diagnostics active (Slot 1) |
| IO-Link Mode Channels 1 ₀ ...1 ₃ | | OFF | Channel Status x = "0" (OFF), no diagnostics active |
| | GREEN | Flashing | IO-Link communication, Process data valid |
| | RED | ON | No IO-Link communication |
| | | Flashing | Process Data Invalid |
| DI Mode Channels 1 ₀ ...1 ₃ | | OFF | Channel Status x = "0" (OFF) |
| | GREEN | ON | Channel Status x = "1" (ON) |
| XSG 1 ₀ ...1 ₇ | | OFF | Channel Status x = "0" (OFF) |
| | GREEN | ON | Channel Status x = "1" (ON) |

* D1 LED also indicates gateway diagnostics

I/O LED status slot 2

| LED | Color | Status | Description |
|---|-------|------------------|--|
| D2 * | | OFF | No diagnostics active |
| | RED | ON | Station error/ module bus communication failure |
| | RED | FLASHING (0.5Hz) | Diagnostics active (Slot 2) |
| IO-Link Mode Channels 2 ₀ ...2 ₃ | | OFF | Channel Status x = "0" (OFF), no diagnostics active |
| | GREEN | Flashing | IO-Link communication, Process data valid |
| | RED | ON | No IO-Link communication |
| | | Flashing | Process Data Invalid |
| DI Mode Channels 2 ₀ ...2 ₃ | | OFF | Channel Status x = "0" (OFF) |
| | GREEN | ON | Channel Status x = "1" (ON) |
| XSG 2 ₀ ...2 ₇ | | OFF | Channel Status x = "0" (OFF) |
| | GREEN | ON | Channel Status x = "1" (ON) |

* D2 LED also indicates gateway diagnostics

Process Data Mapping of Each Protocol

EtherNet/IP™ I/O & Diagnostics Data Mapping

| INPUT | BYTE | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|-----------------------|--|--|--------------------------|--------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| Digital | 0 | DI 1 ₇ | DI 1 ₆ | DI 1 ₅ | DI 1 ₄ | DI 1 ₃ | DI 1 ₂ | DI 1 ₁ | DI 1 ₀ |
| | 1 | OCDO 1 ₇ | OCDO 1 ₆ | OCDO 1 ₅ | OCDO 1 ₄ | DVS 1 ₃ | DVS 1 ₂ | DVS 1 ₁ | DVS 1 ₀ |
| | 2...15 | IO-Link Read Data (depends on parameter settings) | | | | | | | |
| | 16 | DI 2 ₇ | DI 2 ₆ | DI 2 ₅ | DI 2 ₄ | DI 2 ₃ | DI 2 ₂ | DI 2 ₁ | DI 2 ₀ |
| | 17 | OCDO 2 ₇ | OCDO 2 ₆ | OCDO 2 ₅ | OCDO 2 ₄ | DVS 2 ₃ | DVS 2 ₂ | DVS 2 ₁ | DVS 2 ₀ |
| 18...31 | IO-Link Read Data (depends on parameter settings) | | | | | | | | |
| Diagnostics | 32 | Module number reporting diagnostic data | | | | | | | |
| | 33 | Replace Station | - | Diagnostics Active | - | - | - | - | - |
| Slot X (ref. Byte 32) | 34 | IOL X ₀ EVT2 | IOL X ₀ EVTX | IOL X ₀ PDINV | IOL X ₀ HWER | IOL X ₀ DSER | IOL X ₀ CFGER | - | OCDO X ₀ |
| | 35 | IOL X ₀ GENER | IOL X ₀ OVL | IOL X ₀ VHIGH | IOL X ₀ VLOW | IOL X ₀ ULVE | IOL X ₀ LLVU | IOL X ₀ OTMP | IOL X ₀ PRMER |
| | 36 | IOL X ₁ EVT2 | IOL X ₁ EVTX | IOL X ₁ PDINV | IOL X ₁ HWER | IOL X ₁ DSER | IOL X ₁ CFGER | - | OCDO X ₁ |
| | 37 | IOL X ₁ GENER | IOL X ₁ OVL | IOL X ₁ VHIGH | IOL X ₁ VLOW | IOL X ₁ ULVE | IOL X ₁ LLVU | IOL X ₁ OTMP | IOL X ₁ PRMER |
| | 38 | IOL X ₂ EVT2 | IOL X ₂ EVTX | IOL X ₂ PDINV | IOL X ₂ HWER | IOL X ₂ DSER | IOL X ₂ CFGER | - | OCDO X ₂ |
| | 39 | IOL X ₂ GENER | IOL X ₂ OVL | IOL X ₂ VHIGH | IOL X ₂ VLOW | IOL X ₂ ULVE | IOL X ₂ LLVU | IOL X ₂ OTMP | IOL X ₂ PRMER |
| | 40 | IOL X ₃ EVT2 | IOL X ₃ EVTX | IOL X ₃ PDINV | IOL X ₃ HWER | IOL X ₃ DSER | IOL X ₃ CFGER | - | OCDO X ₃ |
| 41 | IOL X ₃ GENER | IOL X ₃ OVL | IOL X ₃ VHIGH | IOL X ₃ VLOW | IOL X ₃ ULVE | IOL X ₃ LLVU | IOL X ₃ OTMP | IOL X ₃ PRMER | |
| OUTPUT | BYTE | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
| Digital | 0 | DO 1 ₇ | DO 1 ₆ | DO 1 ₅ | DO 1 ₄ | - | - | - | - |
| | 1 | - | - | - | - | - | - | - | - |
| | 2...15 | IO-Link Write Data (depends on parameter settings) | | | | | | | |
| | 16 | DO 2 ₇ | DO 2 ₆ | DO 2 ₅ | DO 2 ₄ | - | - | - | - |
| | 17 | - | - | - | - | - | - | - | - |
| 18...31 | IO-Link Write Data (depends on parameter settings) | | | | | | | | |

*The scheduled diagnostic information changes every 125 ms between Slot 1 and Slot 2, if both slots send active diagnostics.

Legend

| | | | |
|-------|----------------------------|-------|-------------------------|
| GENER | Common error | EVT1 | Maintenance events |
| VHIGH | Overvoltage | HWER | Hardware error |
| ULVE | Upper limit value exceeded | CFGER | Wrong or missing device |
| OTMP | Overtemperature | DVS | Data Valid Signal |
| EVT2 | Out of specification error | OC | Over Current |
| PDINV | Process input data invalid | DIAG | Diagnostics |
| DSER | Data storage error | DO | Digital Output |
| OVL | Overload | DI | Digital Input |
| VLOW | Undervoltage | COM | Communication Lost Bit |
| LLVU | Lower limit value underrun | CFG | Configuration Error |
| PRMER | Parameterization error | | |

Modbus® TCP Register Mapping

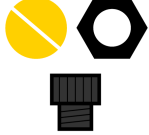
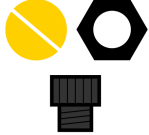
| | REG | Bit 15 | Bit 14 | Bit 13 | Bit 12 | Bit 11 | Bit 10 | Bit 9 | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|--------------|---------------------|---|---------------------|---------------------|---------------------|--------------------|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Inputs (RO) | 0x0000 | OCDO 1 ₇ | OCDO 1 ₆ | OCDO 1 ₅ | OCDO 1 ₄ | DVS 1 ₃ | DVS 1 ₂ | DVS 1 ₁ | DVS 1 ₀ | DI 1 ₇ | DI 1 ₆ | DI 1 ₅ | DI 1 ₄ | DI 1 ₃ | DI 1 ₂ | DI 1 ₁ | DI 1 ₀ |
| | 0x0001... 0x0007 | IO-Link Read Data (depends on parameter settings) | | | | | | | | | | | | | | | |
| | 0x0008 | OCDO 2 ₇ | OCDO 2 ₆ | OCDO 2 ₅ | OCDO 2 ₄ | DVS 2 ₃ | DVS 2 ₂ | DVS 2 ₁ | DVS 2 ₀ | DI 2 ₇ | DI 2 ₆ | DI 2 ₅ | DI 2 ₄ | DI 2 ₃ | DI 2 ₂ | DI 2 ₁ | DI 2 ₀ |
| | 0x0009... 0x000F | IO-Link Read Data (depends on parameter settings) | | | | | | | | | | | | | | | |
| Status (RO) | 0x0010 | - | FCE | - | - | CFG | COM | VI low | VI high | VO low | VO high | OCVI | - | - | - | - | DIAG |
| Diag. (RO) | 0x0011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | S2 DIAG | S1 DIAG |
| Outputs (RW) | 0x0800 | - | - | - | - | - | - | - | - | DO 1 ₇ | DO 1 ₆ | DO 1 ₅ | DO 1 ₄ | - | - | - | - |

| | | | | | | | | | | | | | | | | |
|----------------|---------------------|--|---------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---------------------------------|----------------------------|-----------------------------|----------------------------|----------------------------|-----------------------------|---|-------------------------|
| | 0x0801... 0x0807 | IO-Link Write Data (depends on parameter settings) | | | | | | | | | | | | | | |
| | 0x0808 | - | - | - | - | - | - | - | - | - | DO 2 ₇ | DO 2 ₆ | DO 2 ₅ | DO 2 ₄ | - | - |
| | 0x0809... 0x080F | IO-Link Write Data (depends on parameter settings) | | | | | | | | | | | | | | |
| I/O Diag. (RO) | 0xA000 | IOL 1 ₀ GEN- ER | IOL 1 ₀ OVL | IOL 1 ₀ VHIGH | IOL 1 ₀ VLOW | IOL 1 ₀ ULVE | IOL 1 ₀ LLVU | IOL 1 ₀ OTMP | IOL 1 ₀ PRMEREVT2 | IOL 1 ₀ EVT1 | IOL 1 ₀ PDINV | IOL 1 ₀ HWER | IOL 1 ₀ DSER | IOL 1 ₀ CFGER | - | OC DO 1 ₄ |
| | 0xA001 | IOL 1 ₁ GEN- ER | IOL 1 ₁ OVL | IOL 1 ₁ VHIGH | IOL 1 ₁ VLOW | IOL 1 ₁ ULVE | IOL 1 ₁ LLVU | IOL 1 ₁ OTMP | IOL 1 ₁ PRMEREVT2 | IOL 1 ₁ EVT1 | IOL 1 ₁ PDINV | IOL 1 ₁ HWER | IOL 1 ₁ DSER | IOL 1 ₁ CFGER | - | OC DO 1 ₅ |
| | 0xA002 | IOL 1 ₂ GEN- ER | IOL 1 ₂ OVL | IOL 1 ₂ VHIGH | IOL 1 ₂ VLOW | IOL 1 ₂ ULVE | IOL 1 ₂ LLVU | IOL 1 ₂ OTMP | IOL 1 ₂ PRMEREVT2 | IOL 1 ₂ EVT1 | IOL 1 ₂ PDINV | IOL 1 ₂ HWER | IOL 1 ₂ DSER | IOL 1 ₂ CFGER | - | OC DO 1 ₆ |
| | 0xA003 | IOL 1 ₃ GEN- ER | IOL 1 ₃ OVL | IOL 1 ₃ VHIGH | IOL 1 ₃ VLOW | IOL 1 ₃ ULVE | IOL 1 ₃ LLVU | IOL 1 ₃ OTMP | IOL 1 ₃ PRMEREVT2 | IOL 1 ₃ EVT1 | IOL 1 ₃ PDINV | IOL 1 ₃ HWER | IOL 1 ₃ DSER | IOL 1 ₃ CFGER | - | OC DO 1 ₇ |
| | 0xA004 | IOL 2 ₀ GEN- ER | IOL 2 ₀ OVL | IOL 2 ₀ VHIGH | IOL 2 ₀ VLOW | IOL 2 ₀ ULVE | IOL 2 ₀ LLVU | IOL 2 ₀ OTMP | IOL 2 ₀ PRMEREVT2 | IOL 2 ₀ EVT1 | IOL 2 ₀ PDINV | IOL 2 ₀ HWER | IOL 2 ₀ DSER | IOL 2 ₀ CFGER | - | OC DO 2 ₄ |
| | 0xA005 | IOL 2 ₁ GEN- ER | IOL 2 ₁ OVL | IOL 2 ₁ VHIGH | IOL 2 ₁ VLOW | IOL 2 ₁ ULVE | IOL 2 ₁ LLVU | IOL 2 ₁ OTMP | IOL 2 ₁ PRMEREVT2 | IOL 2 ₁ EVT1 | IOL 2 ₁ PDINV | IOL 2 ₁ HWER | IOL 2 ₁ DSER | IOL 2 ₁ CFGER | - | OC DO 2 ₅ |
| | 0xA006 | IOL 2 ₂ GEN- ER | IOL 2 ₂ OVL | IOL 2 ₂ VHIGH | IOL 2 ₂ VLOW | IOL 2 ₂ ULVE | IOL 2 ₂ LLVU | IOL 2 ₂ OTMP | IOL 2 ₂ PRMEREVT2 | IOL 2 ₂ EVT1 | IOL 2 ₂ PDINV | IOL 2 ₂ HWER | IOL 2 ₂ DSER | IOL 2 ₂ CFGER | - | OC DO 2 ₆ |
| | 0xA007 | IOL 2 ₃ GEN- ER | IOL 2 ₃ OVL | IOL 2 ₃ VHIGH | IOL 2 ₃ VLOW | IOL 2 ₃ ULVE | IOL 2 ₃ LLVU | IOL 2 ₃ OTMP | IOL 2 ₃ PRMEREVT2 | IOL 2 ₃ EVT1 | IOL 2 ₃ PDINV | IOL 2 ₃ HWER | IOL 2 ₃ DSER | IOL 2 ₃ CFGER | - | OC DO 2 ₇ |

PROFINET® Process Data

| | | | | | | | | | |
|---------|---------|--|---------------------|---------------------|---------------------|--------------------|--------------------|--------------------|--------------------|
| Inputs | 0 | DI 1 ₇ | DI 1 ₆ | DI 1 ₅ | DI 1 ₄ | DI 1 ₃ | DI 1 ₂ | DI 1 ₁ | DI 1 ₀ |
| | 1 | OCDO 1 ₇ | OCDO 1 ₆ | OCDO 1 ₅ | OCDO 1 ₄ | DVS 1 ₃ | DVS 1 ₂ | DVS 1 ₁ | DVS 1 ₀ |
| | 2...15 | IO-Link Read Data (depends on parameter settings) | | | | | | | |
| | 16 | DI 2 ₇ | DI 2 ₆ | DI 2 ₅ | DI 2 ₄ | DI 2 ₃ | DI 2 ₂ | DI 2 ₁ | DI 2 ₀ |
| | 17 | OCDO 2 ₇ | OCDO 2 ₆ | OCDO 2 ₅ | OCDO 2 ₄ | DVS 2 ₃ | DVS 2 ₂ | DVS 2 ₁ | DVS 2 ₀ |
| | 18...31 | IO-Link Read Data (depends on parameter settings) | | | | | | | |
| Outputs | 0 | DO 1 ₇ | DO 1 ₆ | DO 1 ₅ | DO 1 ₄ | - | - | - | - |
| | 1 | - | - | - | - | - | - | - | - |
| | 2...15 | IO-Link Write Data (depends on parameter settings) | | | | | | | |
| | 16 | DO 2 ₇ | DO 2 ₆ | DO 2 ₅ | DO 2 ₄ | - | - | - | - |
| | 17 | - | - | - | - | - | - | - | - |
| | 18...31 | IO-Link Write Data (depends on parameter settings) | | | | | | | |

Accessories

| Type code | Ident-No. | | Dimension drawing |
|----------------------|-----------|--|---|
| LOCK-EURO-C | A0885 | Locking guard for straight eurofast™ C-body connectors (RKC, RKCV, RSC, RSCV) in a Class I, Division 2 installations |  |
| LOCK-EURO-C (10/BAG) | A0886 | Locking guard for straight eurofast™ C-body connectors (RKC, RKCV, RSC, RSCV) in a Class I, Division 2 installations |  |