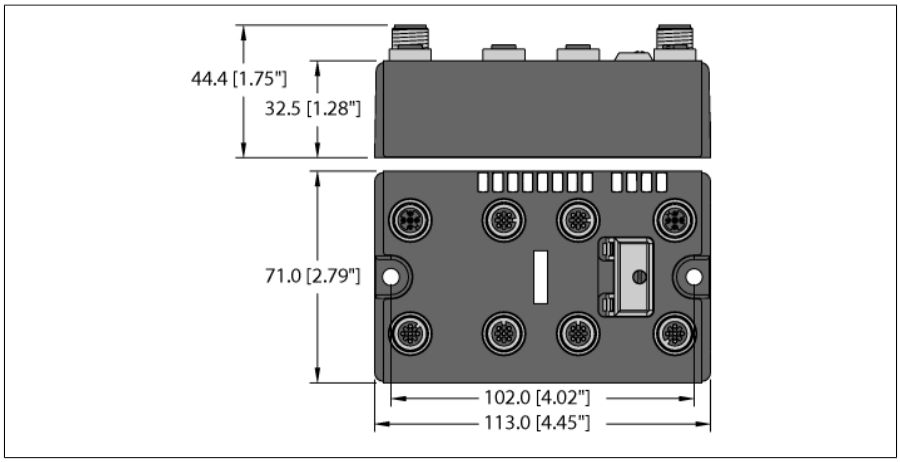
# BL compact™ multiprotocol fieldbus station for Industrial Ethernet
# 4 Analog Inputs for Current or Voltage
# BLCEN-4M12MT-4AI-VI



| | |
|---|---|
| Type | BLCEN-4M12MT-4AI-VI |
| ID | 6811468 |
| | |
| Nominal system voltage | 24 VDC |
| System power supply | Via auxiliary power |
| Voltage supply connection | 2 x M12, 5-pin |
| Admissible range Vi | 11…30 VDC |
| Nominal current Vi | 137 mA |
| Max. current Vi | 1 A |
| | |
| Fieldbus transmission rate | 10/100 Mbps |
| Adjustment transmission rate | Automatic detection |
| Fieldbus address range | 1…92<br>0 (192.168.1.254)<br>93 (BOOTP)<br>94 (DHCP)<br>95 (PGM)<br>96 (PGM-DHCP) *recommended for PROFINET<br>97…98 (manufacturer specific) |
| Fieldbus addressing | 2 decimally coded rotary switches |
| Fieldbus connection technology | 2 × M12 |
| | 4-pole, D-coded |
| Protocol detection | automatic |
| Web server | Integrated |
| Service interface | Ethernet |
| Vendor ID | 48 |
| Product type | 12 |
| Product code | 11468 |
| | |
| 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. 6 register |
| Input register start address | 0 (0x0000 hex) |

- 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
- 4 analog inputs for current or voltage
- 0/4…20 mA or -10/0…+10 VDC (selectable per channel)

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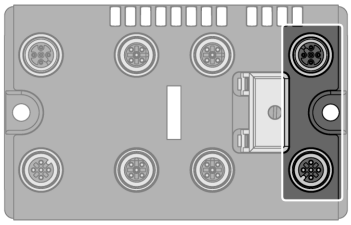
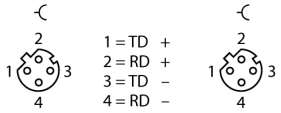
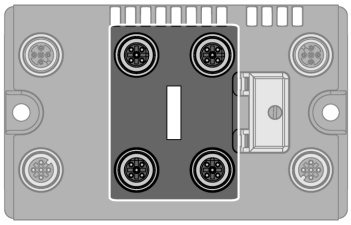
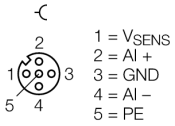
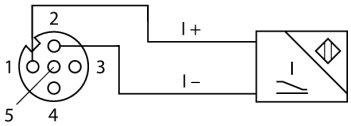
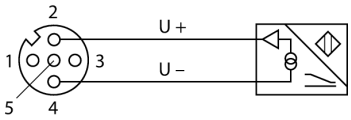
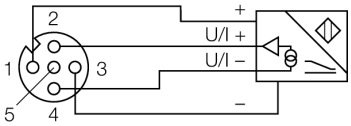
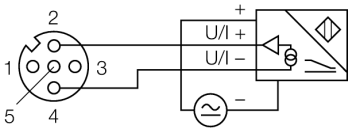
| | |
|---|---|
| Ethernet/IP | |
| Addressing | acc. to EtherNet/IP specification |
| Device Level Ring (DLR) | supported |
| Class 1 connections (CIP) | 6 |
| Input Assembly Instance | 103 |
| Input Data Size | 7 INT |
| Output Assembly Instance | 104 |
| Output Data Size | 1 INT |
| Configuration 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. 8 BYTE |

| | |
|---|---|
| Analog inputs | from 4AI-VI |
| Operating modes | 0/4 … 20 mA or -10/0 … 10 VDC |
| Type of input diagnostics | Channel diagnostics |
| Sensor supply | 24 VDC, 1 amp max. |
| Input resistance | Current: < 0.125 KΩ, Voltage: < 98.5 KΩ |
| Maximum limiting frequency analog | < 20 Hz |
| Basic fault limit at 23 °C | < 0.3 % |
| Repeatability | < 0.05 % |
| Temperature coefficient | < 300 ppm / °C of full scale |
| Resolution | 16 Bit |
| Measuring principle | Sigma Delta |
| Measurement display | 16 bit signed integer |
| | 12 bit full range left-justified |

| | |
|---|---|
| Dimensions | 113 x 71 x 32.5 mm |
| Mounting | 2 × 5.4 mm diameter holes, 1.7 Nm torque |
| Weight | 390 ± 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<br>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 | 122 years |
| MTTF note | acc. to SN 29500 (Ed. 99) 20 °C |
| Approvals and certificates | CE, cULus, Class I Div.2 |

## Pinning and wiring diagram

| | | |
|---|---|---|
|  | **Ethernet**<br>Fieldbus cable (IP67 example): RSSD RSSD 441-2M ID number U-02482 or RSSD-RSSD-441-2M/S2174 ID number 6914218 | Pin assignment (M12, D-coded)<br>  |
|  | **Analog Inputs**<br>Extension cable (example): RK 4.5T-2-RS 4.5T/S653 ident-no. U2187-09 or RKC4.5T-2-RSC4.5T/TEL ident-no. 6625212 | Pin Assignment<br>  <br>2-wire Technology (Current)<br>  <br>2-wire Technology (Voltage)<br>  <br>3-wire Technology<br> <br>4-wire Technology<br>  <br>4-wire Technology (External Power)<br>  |

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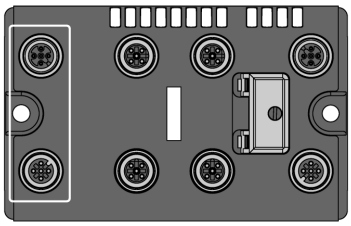
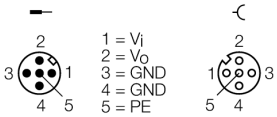


**Auxiliary Power**

Extension cable (example): RKC 4.4T-2-RSC 4.4T ident-no. U5264 or RKC4.4T-2-RSC4.4T/TEL ident-no. 6625208

Pin Assignment



**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**

| LED | Color | Status | Description |
|---|---|---|---|
| D * | | OFF | No diagnostics active |
| | RED | ON | Station error/ module bus communication failure |
| | RED | FLASHING (0.5Hz) | Diagnostics active |
| AI channel 0...3 | | OFF | Not active |
| | GREEN | ON | Active |
| | GREEN | FLASHING (0.5 Hz) | Underflow in measuring range |
| | GREEN | FLASHING (4 Hz) | Overflow in measuring range |

* D 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 |
|---|---|---|---|---|---|---|---|---|---|
| AI $1_0$ | 0 | AI $1_0$ LSB | | | | | | | |
| | 1 | AI $1_0$ MSB | | | | | | | |
| AI $1_1$ | 2 | AI $1_1$ LSB | | | | | | | |
| | 3 | AI $1_1$ MSB | | | | | | | |
| AI $1_2$ | 4 | AI $1_2$ LSB | | | | | | | |
| | 5 | AI $1_2$ MSB | | | | | | | |
| AI $1_3$ | 6 | AI $1_3$ LSB | | | | | | | |
| | 7 | AI $1_3$ MSB | | | | | | | |
| Diagnostics | 8 | Module number reporting diagnostic data | | | | | | | |
| | 9 | Replace Station | - | Diagnostics Active | - | - | - | - | - |
| Slot 1 (ref. Byte 8) | 10 | - | - | - | - | - | - | Open Circuit AI $1_0$ | Range Error AI $1_0$ |
| | 11 | - | - | - | - | - | - | Open Circuit AI $1_1$ | Range Error AI $1_1$ |
| | 12 | - | - | - | - | - | - | Open Circuit AI $1_2$ | Range Error AI $1_2$ |
| | 13 | - | - | - | - | - | - | Open Circuit AI $1_3$ | Range Error AI $1_3$ |

Legend:

| | | | |
|---|---|---|---|
| AI | Analog Input | MR | Measurement Value Range Error |
| CFG | Configuration Error | OC | Open Circuit |
| COM | Communication Failure | S1 | Slot 1 |
| DIA | Diagnostics Active | VI low | VI Voltage |
| FCE | Force Mode Active | VO low | VO Voltage |

**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 | AI $1_0$ | | | | | | | | | | | | | | | |
| | 0x0001 | AI $1_1$ | | | | | | | | | | | | | | | |
| | 0x0002 | AI $1_2$ | | | | | | | | | | | | | | | |
| | 0x0003 | AI $1_3$ | | | | | | | | | | | | | | | |
| Status (RO) | 0x0004 | - | FCE | - | - | CFG | COM | VI low | - | VO low | - | - | - | - | - | - | DIA |
| Diag. (RO) | 0x0005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | S1 DIA |
| I/O Diag. (RO) | 0xA000 | - | - | - | - | - | - | OCAI $1_1$ | MRAI $1_1$ | - | - | - | - | - | - | OCAI $1_0$ | MRAI $1_0$ |
| | 0xA001 | - | - | - | - | - | - | OCAI $1_3$ | MRAI $1_3$ | - | - | - | - | - | - | OCAI $1_2$ | MRAI $1_2$ |

**PROFINET® Process Data**

| | BYTE | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|---|
| Inputs | 0 | AI $1_0$ LSB | | | | | | | |
| | 1 | AI $1_0$ MSB | | | | | | | |
| | 2 | AI $1_1$ LSB | | | | | | | |
| | 3 | AI $1_1$ MSB | | | | | | | |
| | 4 | AI $1_2$ LSB | | | | | | | |
| | 5 | AI $1_2$ MSB | | | | | | | |
| | 6 | AI $1_3$ LSB | | | | | | | |
| | 7 | AI $1_3$ MSB | | | | | | | |

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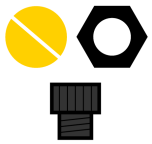
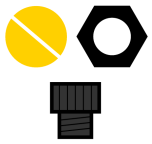
## Accessories

| 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 |  |

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