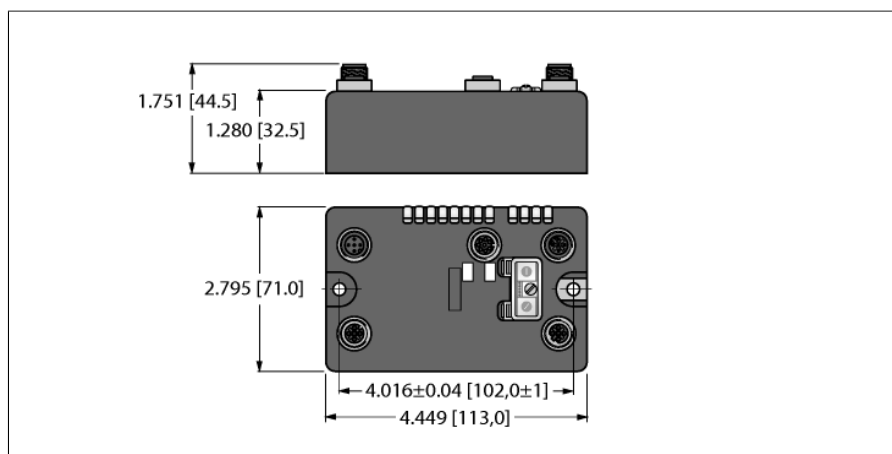


# BL compact™ multiprotocol fieldbus station for Industrial Ethernet

## RS485/RS422 Interface

### BLCEN-1M12MT-1RS485-422



|                                |                                                                                                                                                  |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Type                           | BLCEN-1M12MT-1RS485-422                                                                                                                          |
| ID                             | 6811462                                                                                                                                          |
| Nominal system voltage         | 24 VDC                                                                                                                                           |
| System power supply            | Via auxiliary power                                                                                                                              |
| Voltage supply connection      | 2 x M12, 5-pin                                                                                                                                   |
| Admissible range $V_i$         | 18...30 VDC                                                                                                                                      |
| Nominal current $I_i$          | 150 mA                                                                                                                                           |
| Max. current $I_i$             | 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 x M12<br>4-pole, D-coded                                                                                                                       |
| Protocol detection             | automatic                                                                                                                                        |
| Web server                     | Integrated                                                                                                                                       |
| Service interface              | Ethernet                                                                                                                                         |
| Vendor ID                      | 48                                                                                                                                               |
| Product type                   | 12                                                                                                                                               |
| Product code                   | 11462                                                                                                                                            |

- 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
- Transmission of serial data via RS485/422 interface
- For connection of devices such as: printers, scanners, or bar code readers

|                               |                                                |
|-------------------------------|------------------------------------------------|
| <b>Modbus TCP</b>             |                                                |
| 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)                                 |
| Output Data Size              | max. 4 register                                |
| Output register start address | 2048 (0x0800 hex)                              |

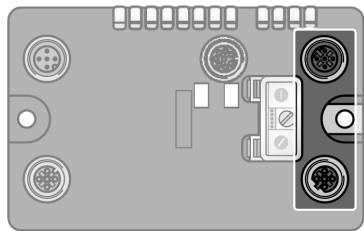
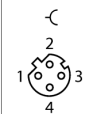
|                                 |                                   |
|---------------------------------|-----------------------------------|
| <b>Ethernet/IP</b>              |                                   |
| Addressing                      | acc. to EtherNet/IP specification |
| Device Level Ring (DLR)         | supported                         |
| Class 1 connections (CIP)       | 6                                 |
| Input Assembly Instance         | 103                               |
| Input Data Size                 | 6 INT                             |
| Output Assembly Instance        | 104                               |
| Output Data Size                | 4 INT                             |
| Configuration Assembly Instance | 106                               |
| Configuration Size              | 0                                 |
| Comm Format                     | Data - INT                        |

|                                 |                                 |
|---------------------------------|---------------------------------|
| <b>PROFINET</b>                 |                                 |
| 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                     |
| Output Data Size                | max. 8 BYTE                     |

|                      |                                                                                                                      |
|----------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Technology</b>    |                                                                                                                      |
| Signal type          | RS485 / 422                                                                                                          |
| Number of channels   | 1                                                                                                                    |
| Transmission signals | TxD, RxD                                                                                                             |
| Connection type      | 2-wire half duplex or 4-wire full duplex                                                                             |
| Cable length         | 1000 m                                                                                                               |
| Line impedance       | 120 Ω                                                                                                                |
| Terminating resistor | external                                                                                                             |
| Parameters           | RS485/422, transmission rate, diagnostics, data bits, stop bits, XON-character, XOFF-character, parity, flow control |
| Electrical isolation | isolation of electronics and field level via optocouplers                                                            |

|                                   |                                                    |
|-----------------------------------|----------------------------------------------------|
| Dimensions                        | 113 x 71 x 32.5 mm                                 |
| Mounting                          | 2 × 5.4 mm diameter holes, 1.7 Nm torque           |
| Weight                            | 330 ± 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                                |
| Approvals and certificates        | CE, cULus                                          |

Pinning and wiring diagram

|                                                                                   |                                                                                                                                             |                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>Ethernet</b></p> <p>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-code)</p> <div></div> |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 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                           |
|         | 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                              |

\* 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                  |
|----------------------|------|-----------------------------------------|------------|--------------------|-----------------|-------------|--------------------------------------|------------------|------------------------|
| Status Bytes         | 0    | STAT                                    | TX_CNT_ACK |                    | RX_CNT          |             | RX_BYTE_CNT                          |                  |                        |
|                      | 1    | BUF_OVFL                                | FRAME_ERR  | HNDSH_ERR          | HW_FAILURE      | PRM_ERR     | -                                    | -                | -                      |
| User Data            | 2    | Data Byte 0                             |            |                    |                 |             |                                      |                  |                        |
|                      | 3    | Data Byte 1                             |            |                    |                 |             |                                      |                  |                        |
|                      | 4    | Data Byte 2                             |            |                    |                 |             |                                      |                  |                        |
|                      | 5    | Data Byte 3                             |            |                    |                 |             |                                      |                  |                        |
|                      | 6    | Data Byte 4                             |            |                    |                 |             |                                      |                  |                        |
|                      | 7    | Data Byte 5                             |            |                    |                 |             |                                      |                  |                        |
| Diagnostics          | 8    | Module number reporting diagnostic data |            |                    |                 |             |                                      |                  |                        |
|                      | 9    | Replace Station                         | -          | Diagnostics Active | -               | -           | -                                    | -                | -                      |
| Slot 1 (ref. Byte 8) | 10   | -                                       | -          | -                  | Buffer Overflow | Frame Error | Data Flow Control Error (RS422 Only) | Hardware Failure | Parameterization Error |
|                      | 11   | -                                       | -          | -                  | -               | -           | -                                    | -                | -                      |
| OUTPUT               | BYTE | Bit 7                                   | Bit 6      | Bit 5              | Bit 4           | Bit 3       | Bit 2                                | Bit 1            | Bit 0                  |
| Control Bytes        | 0    | STAT_RES                                | RX_CNT_ACK |                    | TCX_CNT         |             | TX_BYTE_CNT                          |                  |                        |
|                      | 1    | -                                       | -          | -                  | -               | -           | -                                    | RXBUF_FLUSH      | TXBUF_FLUSH            |
| User Data            | 2    | Data Byte 0                             |            |                    |                 |             |                                      |                  |                        |
|                      | 3    | Data Byte 1                             |            |                    |                 |             |                                      |                  |                        |
|                      | 4    | Data Byte 2                             |            |                    |                 |             |                                      |                  |                        |
|                      | 5    | Data Byte 3                             |            |                    |                 |             |                                      |                  |                        |
|                      | 6    | Data Byte 4                             |            |                    |                 |             |                                      |                  |                        |
|                      | 7    | Data Byte 5                             |            |                    |                 |             |                                      |                  |                        |

### 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            | BUF OVFL             | FRM    | HNDSH ERR | HW     | PRM    | -      | -           | -           | STAT     | TX_CNT_ACK | RX_CNT  |       |       | RX_BYTE_CNT |       |        |
|                | 0x0001 ... 0x0003 | Read Data (3 Words)  |        |           |        |        |        |             |             |          |            |         |       |       |             |       |        |
| Status (RO)    | 0x0004            | -                    | FCE    | -         | -      | CFG    | COM    | VI low      | -           | VO low   | -          | -       | -     | -     | -           | -     | DIA    |
| Diag. (RO)     | 0x0005            | -                    | -      | -         | -      | -      | -      | -           | -           | -        | -          | -       | -     | -     | -           | -     | S1 DIA |
| Outputs (RW)   | 0x0800            | -                    | -      | -         | -      | -      | -      | RXBUF FLUSH | TXBUF FLUSH | STAT RES | RX_CNT_ACK | TCX_CNT |       |       | TX_BYTE_CNT |       |        |
|                | 0x0801 ... 0x0803 | Write Data (3 Words) |        |           |        |        |        |             |             |          |            |         |       |       |             |       |        |
| I/O Diag. (RO) | 0xA000            | -                    | -      | -         | -      | -      | -      | -           | -           | OF       | FRM        | DFC     | HW    | PRM   | -           | -     | -      |

### PROFINET® Process Data

|         | BYTE | Bit 7       | Bit 6      | Bit 5     | Bit 4      | Bit 3   | Bit 2       | Bit 1       | Bit 0       |
|---------|------|-------------|------------|-----------|------------|---------|-------------|-------------|-------------|
| Inputs  | 0    | STAT        | TX_CNT_ACK |           | RX_CNT     |         | RX_BYTE_CNT |             |             |
|         | 1    | BUF_OVFL    | FRAME_ERR  | HNDSH_ERR | HW_FAILURE | PRM_ERR | -           | -           | -           |
|         | 2    | Data Byte 0 |            |           |            |         |             |             |             |
|         | 3    | Data Byte 1 |            |           |            |         |             |             |             |
|         | 4    | Data Byte 2 |            |           |            |         |             |             |             |
|         | 5    | Data Byte 3 |            |           |            |         |             |             |             |
|         | 6    | Data Byte 4 |            |           |            |         |             |             |             |
|         | 7    | Data Byte 5 |            |           |            |         |             |             |             |
| Outputs | 0    | STAT_RES    | RX_CNT_ACK |           | TCX_CNT    |         | TX_BYTE_CNT |             |             |
|         | 1    | -           | -          | -         | -          | -       | -           | RXBUF_FLUSH | TXBUF_FLUSH |
|         | 2    | Data Byte 0 |            |           |            |         |             |             |             |
|         | 3    | Data Byte 1 |            |           |            |         |             |             |             |
|         | 4    | Data Byte 2 |            |           |            |         |             |             |             |
|         | 5    | Data Byte 3 |            |           |            |         |             |             |             |
|         | 6    | Data Byte 4 |            |           |            |         |             |             |             |
|         | 7    | Data Byte 5 |            |           |            |         |             |             |             |