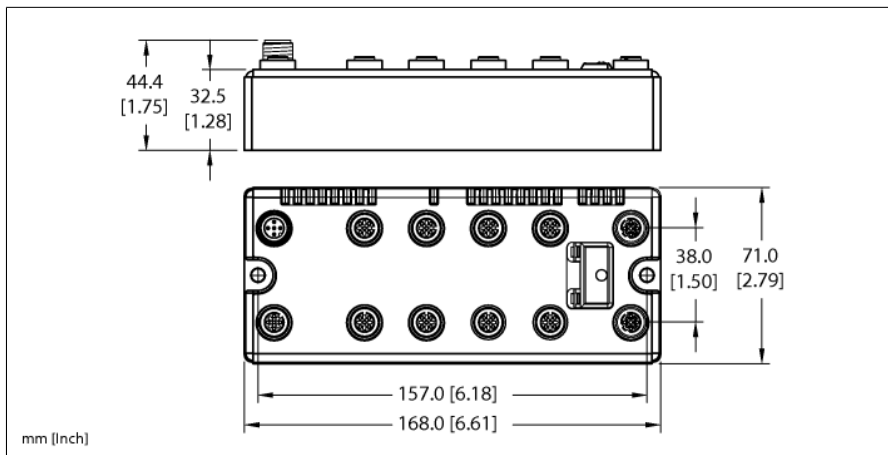


BL compact™ multiprotocol fieldbus station for Industrial Ethernet

8 Analog Inputs for Current or Voltage and 8 Analog Outputs for Voltage

BLCEN-8M12LT-4AI4AO-VI-4AI4AO-VI



ID	6811455
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	225 mA
Max. current Vi	2 A
Admissible range Vo	11...30 VDC
Nominal current Vo	100 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	11455

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

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. 10 register
Input register start address	0 (0x0000 hex)
Output Data Size	max. 8 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	13 INT
Output Assembly Instance	104
Output Data Size	8 INT
Configuration Assembly Instance	106
Configuration Size	0
Comm Format	Data - INT

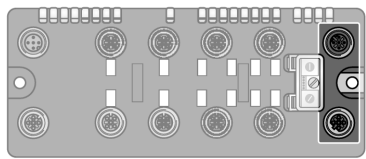
PROFINET	
Addressing	DCP
Conformance class	B (RT)
MinCycleTime	1 ms
Diagnostics	acc. to PROFINET alarm handling
Topology detection	supported
Automatic addressing	supported
Media Redundancy Protocol (MRP)	supported
Input Data Size	max. 16 BYTE
Output Data Size	max. 16 BYTE

Analog inputs	
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: < 0.065 K Ω , Voltage: < 225 K Ω
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

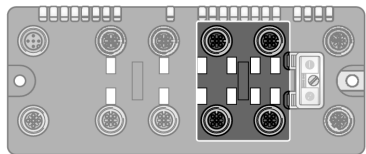
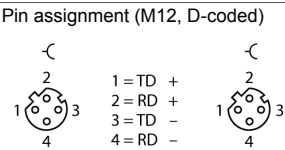
Analog outputs	
Operating modes	-10/0 ... 10 V
Type of output diagnostics	Channel diagnostics
Sensor supply	24 VDC, 250 mA per channel
Load resistance, resistive	> 1 k Ω
Load resistance, capacitive	< 1 μ F
Transmission frequency	< 100 Hz
Basic fault limit at 23 °C	< 0.3 %
Repeat accuracy	< 0.05 %
Temperature coefficient	< 300 ppm/°C of full scale
Resolution	16 bit
Measured-value display	16 bit signed integer
	12 bit full range left-justified

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	68 years
MTTF note	acc. to SN 29500 (Ed. 99) 20 °C
Approvals and certificates	CE, cULus, Class I Div.2

Pinning and wiring diagram

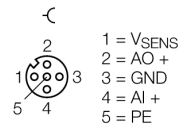


Ethernet
Fieldbus cable (IP67 example): RSSD RSSD 441-2M ID number U-02482 or RSSD-RSSD-441-2M/S2174 ID number 6914218

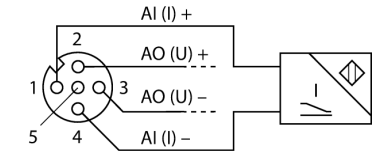


Slot 1: Analog Inputs and Outputs
Extension cable (example): RK 4.5T-2-RS 4.5T/S653 ident-no. U2187-09 or RKC4.5T-2-RSC4.5T/TEL ident-no. 6625212

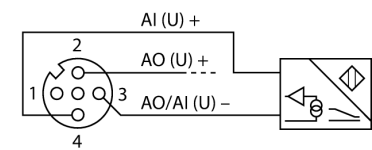
Pin Assignment



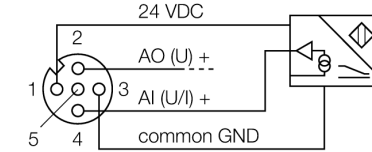
2-wire Technology (Current)



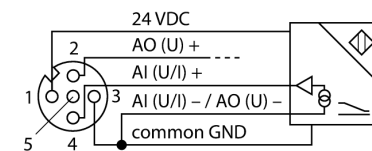
2-wire connection (voltage)



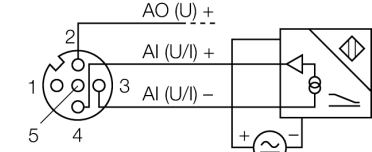
3-wire connection

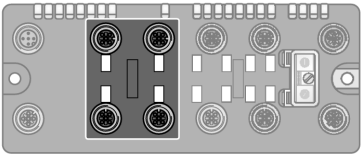


4-wire Technology



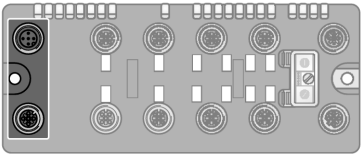
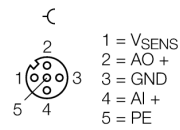
4-wire connection (external voltage supply)





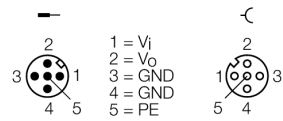
Slot 2: Analog Inputs and Outputs
See slot 1

Pin Assignment



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)	ARGE Running
	RED	ON	Error
	RED	FLASHING	WINK
LNK/ACT	YELLOW	ON	DHCP/BOOTP Search
		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)
AI channels 0...3		OFF	Channel inactive
	GREEN	ON	Channel active
	GREEN	FLASHING (0.5 Hz)	Underflow diagnostics
	GREEN	FLASHING (4 Hz)	Overflow diagnostics
AO channels 4...7			Not connected (The analog outputs do not have a LED)

* 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)
AI channels 0...3		OFF	Channel inactive
	GREEN	ON	Channel active
	GREEN	FLASHING (0.5 Hz)	Underflow diagnostics
	GREEN	FLASHING (4 Hz)	Overflow diagnostics
AO channels 4...7			Not connected (The analog outputs do not have a LED)

* 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
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							
AI 2 ₀	8	AI 2 ₀ LSB							
	9	AI 2 ₀ MSB							
AI 2 ₁	10	AI 2 ₁ LSB							
	11	AI 2 ₁ MSB							
AI 2 ₂	12	AI 2 ₂ LSB							
	13	AI 2 ₂ MSB							
AI 2 ₃	14	AI 2 ₃ LSB							
	15	AI 2 ₃ MSB							
Diagnostics	16	Module number reporting diagnostic data							
	17	Replace Station	-	Diagnostics Active	-	-	-	-	-
Slot X* (ref. Byte 16)	18 / 26	Hardware Failure	-	-	-	AI X ₀ Overflow/Underflow	-	Wire Break AI X ₀ (4...20 mA range only)	Range Error AI X ₀
	19 / 27	Hardware Failure	-	-	-	AO X ₀ Overflow/Underflow	-	-	Range Error AO X ₀
	20 / 28	Hardware Failure	-	-	-	AI X ₁ Overflow/Underflow	-	Wire Break AI X ₁ (4...20 mA range only)	Range Error AI X ₁
	21 / 29	Hardware Failure	-	-	-	AO X ₁ Overflow/Underflow	-	-	Range Error AO X ₁
	22 / 30	Hardware Failure	-	-	-	AI X ₂ Overflow/Underflow	-	Wire Break AI X ₂ (4...20 mA range only)	Range Error AI X ₂
	23 / 31	Hardware Failure	-	-	-	AO X ₂ Overflow/Underflow	-	-	Range Error AO X ₂
	24 / 32	Hardware Failure	-	-	-	AI X ₃ Overflow/Underflow	-	Wire Break AI X ₃ (4...20 mA range only)	Range Error AI X ₃
	25 / 33	Hardware Failure	-	-	-	AO X ₃ Overflow/Underflow	-	-	Range Error AO X ₃
OUTPUT	BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
AO 1 ₀	0	AO 1 ₀ LSB							
	1	AO 1 ₀ MSB							
AO 1 ₁	2	AO 1 ₁ LSB							
	3	AO 1 ₁ MSB							
AO 1 ₂	4	AO 1 ₂ LSB							
	5	AO 1 ₂ MSB							
AO 1 ₃	6	AO 1 ₃ LSB							
	7	AO 1 ₃ MSB							
AO 2 ₀	8	AO 2 ₀ LSB							
	9	AO 2 ₀ MSB							
AO 2 ₁	10	AO 2 ₁ LSB							
	11	AO 2 ₁ MSB							
AO 2 ₂	12	AO 2 ₂ LSB							
	13	AO 2 ₂ MSB							
AO 2 ₃	14	AO 2 ₃ LSB							
	15	AO 2 ₃ MSB							

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

Legend:

MR	Measured Value out of range	FCE	Force Mode Enabled
WB	Wire break (4-20 mA only)	CFG	Configuration Error
OFU	Overflow/Underflow	COM	Modulebus Configuration Error
HW	Hardware Error	VI LOW	Voltage Field Supply Usys
OVR	Output value out of range	VO LOW	Voltage Field Supply Ui
OFU	Overflow/Underflow	DIA	Module Diagnostics Available

Modbus® TCP Register Mapping

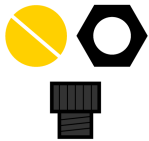
	REG	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Inputs (RO)	0x0000	AI 1 ₀															
	0x0001	AI 1 ₁															
	0x0002	AI 1 ₂															
	0x0003	AI 1 ₃															
	0x0004	AI 2 ₀															
	0x0005	AI 2 ₁															
	0x0006	AI 2 ₂															
	0x0007	AI 2 ₃															
Status (RO)	0x0008	-	FCE	-	-	CFG	COM	VI low	-	VO low	-	-	-	-	-	-	DIA
Diag. (RO)	0x0009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S2 DIA	S1 DIA
Outputs (RW)	0x0800	AO 1 ₀															
	0x0801	AO 1 ₁															
	0x0802	AO 1 ₂															
	0x0803	AO 1 ₃															
	0x0804	AO 2 ₀															
	0x0805	AO 2 ₁															
	0x0806	AO 2 ₂															
	0x0807	AO 2 ₃															
I/O Diag. (RO)	0xA000	HWA0 1 ₄	-	-	-	OFUA0 1 ₄	-	-	OVRA0HWA1 1 ₁	1 ₀	-	-	-	OFUA1 1 ₀	-	WBA1 1 ₀	MRA1 1 ₀
	0xA001	HWA0 1 ₅	-	-	-	OFUA0 1 ₅	-	-	OVRA0HWA1 1 ₅	1 ₁	-	-	-	OFUA1 1 ₁	-	WBA1 1 ₁	MRA1 1 ₁
	0xA002	HWA0 1 ₆	-	-	-	OFUA0 1 ₆	-	-	OVRA0HWA1 1 ₆	1 ₂	-	-	-	OFUA1 1 ₂	-	WBA1 1 ₂	MRA1 1 ₂
	0xA003	HWA0 1 ₇	-	-	-	OFUA0 1 ₇	-	-	OVRA0HWA1 1 ₇	1 ₃	-	-	-	OFUA1 1 ₃	-	WBA1 1 ₃	MRA1 1 ₃
	0xA004	HWA0 2 ₄	-	-	-	OFUA0 2 ₄	-	-	OVRA0HWA1 2 ₁	2 ₀	-	-	-	OFUA1 2 ₀	-	WBA1 2 ₀	MRA1 2 ₀
	0xA005	HWA0 2 ₅	-	-	-	OFUA0 2 ₅	-	-	OVRA0HWA1 2 ₅	2 ₁	-	-	-	OFUA1 2 ₁	-	WBA1 2 ₁	MRA1 2 ₁
	0xA006	HWA0 2 ₆	-	-	-	OFUA0 2 ₆	-	-	OVRA0HWA1 2 ₆	2 ₂	-	-	-	OFUA1 2 ₂	-	WBA1 2 ₂	MRA1 2 ₂
	0xA007	HWA0 2 ₇	-	-	-	OFUA0 2 ₇	-	-	OVRA0HWA1 2 ₇	2 ₃	-	-	-	OFUA1 2 ₃	-	WBA1 2 ₃	MRA1 2 ₃

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							
	8	AI 2 ₀ LSB							
	9	AI 2 ₀ MSB							
	10	AI 2 ₁ LSB							
	11	AI 2 ₁ MSB							
	12	AI 2 ₂ LSB							
	13	AI 2 ₂ MSB							
	14	AI 2 ₃ LSB							
	15	AI 2 ₃ MSB							
Outputs	0	AO 1 ₀ LSB							
	1	AO 1 ₀ MSB							
	2	AO 1 ₁ LSB							
	3	AO 1 ₁ MSB							

4	AO 1 ₂ LSB
5	AO 1 ₂ MSB
6	AO 1 ₃ LSB
7	AO 1 ₃ MSB
8	AO 2 ₀ LSB
9	AO 2 ₀ MSB
10	AO 2 ₁ LSB
11	AO 2 ₁ MSB
12	AO 2 ₂ LSB
13	AO 2 ₂ MSB
14	AO 2 ₃ LSB
15	AO 2 ₃ MSB

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	