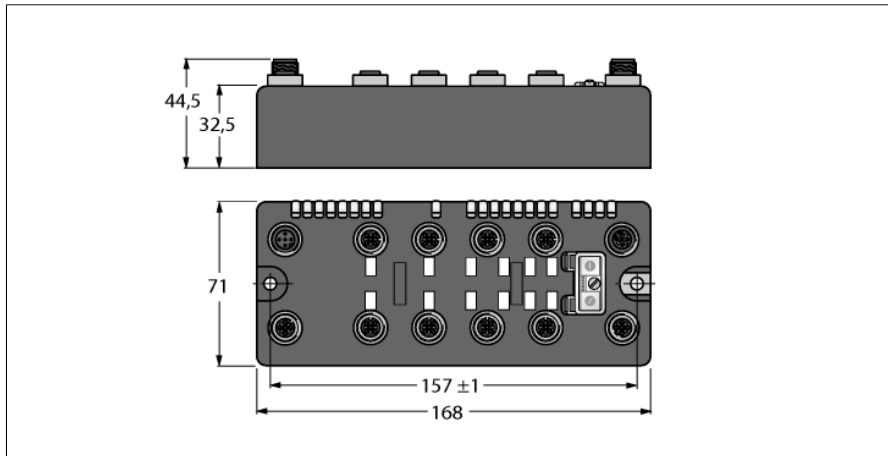


BL compact Multiprotocol Station for Industrial Ethernet
8 Analog Current or Voltage Inputs and 8 Analog Voltage Outputs
BLCEN-8M12LT-4AI4AO-VI-4AI4AO-VI



- On-Machine™ compact fieldbus I/O blocks
- EtherNet/IP™, Modbus® TCP or PROFINET slave
- Integrated Ethernet switch
- 10 Mbps/100 Mbps supported
- Two 4-pin, D-coded M12 connectors for fieldbus connection
- 2 rotary coding switches for node-address
- IP 69K
- M12 I/O ports
- LEDs indicating status and diagnostics
- Electronics galvanically isolated from the field level via optocouplers
- 8 analoge Eingänge für Strom oder Spannung
- 0/4...20 mA or -10/0...+10 VDC (kanalweise umschaltbar)
- 8 analoge Spannungsausgänge
- -10/0...+10 VDC

Type designation	BLCEN-8M12LT-4AI4AO-VI-4AI4AO-VI
Ident no.	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 dec. Rotary coding switches
Fieldbus connection technology	2 x M12 4-pin, D-coded
Protocol detection	automatic
Web server	Integrated
Service interface	Ethernet
Vendor ID	48
Product type	12
Product code	11455
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)

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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	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, max. 1 A
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

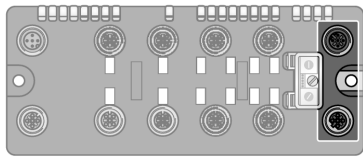
Analog outputs

Operating modes	-10/0 ... 10 V
Type of output diagnostics	Channel diagnostics
Sensor supply	24 VDC, 250 mA pro Kanal
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 v.E.
Resolution	16 Bit
Measured-value display	16 bit signed integer 12 bit full range left-justified

BL compact Multiprotocol Station for Industrial Ethernet
8 Analog Current or Voltage Inputs and 8 Analog Voltage Outputs
BLCEN-8M12LT-4AI4AO-VI-4AI4AO-VI

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 fiber reinforced nylon, nickel-plated connector
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...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	acc. 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

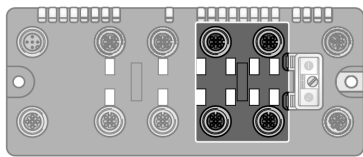
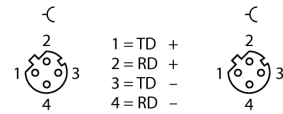
BL compact Multiprotocol Station for Industrial Ethernet
8 Analog Current or Voltage Inputs and 8 Analog Voltage Outputs
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Ethernet

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

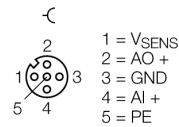
Pin assignment (M12, D-coded)



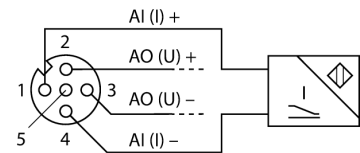
Slot 1: Analog Inputs and Outputs

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

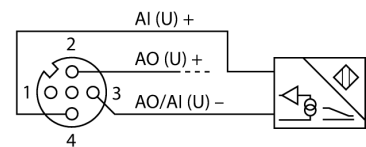
Pin Assignment



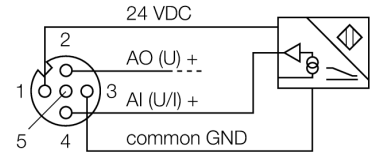
2-wire Technology (Current)



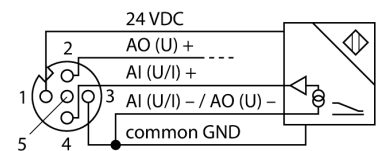
2-wire connection (voltage)



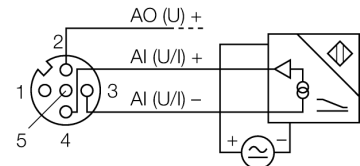
3-wire connection



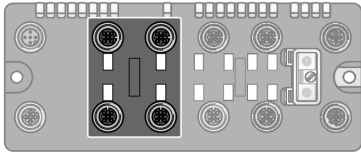
4-wire Technology



4-wire connection (external voltage supply)

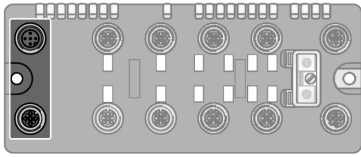
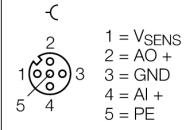


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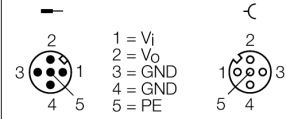
Slot 2: Analog Inputs and Outputs
See slot 1

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



BL compact Multiprotocol Station for Industrial Ethernet
8 Analog Current or Voltage Inputs and 8 Analog Voltage Outputs
BLCEN-8M12LT-4AI4AO-VI-4AI4AO-VI
Status: Station LED

LED	Color	Status	Description
IOs		OFF	Power off
	RED	ON	Insufficient power supply
	RED	FLASHING (1Hz)	Deviating station configuration
	RED	FLASHING (4 Hz)	No 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
IO	GREEN	ON	I/O slots OK
	GREEN	FLASHING (1Hz)	At least one I/O slot in idle state
	RED	ON	At least one faulty I/O slot
	RED	FLASHING	At least one I/O slot in faulty state

Status: I/O LED, slot 1

LED	Color	Status	Description
D1 *		OFF	Diagnostic disabled
	RED	ON	Station / module bus communication failure
	RED	FLASHING (0.5Hz)	Summarized diagnostic
AI channels 0...3		OFF	Channel disabled
	GREEN	ON	Channel active
	GREEN	FLASHING (0.5 Hz)	Measuring range undershoot
	GREEN	FLASHING (4 Hz)	Measuring range overshoot
AO channels 4...7			Without function (no LEDs for analog outputs)

* D1 LED also indicates gateway diagnostic

I/O LED Status Slot 2

LED	Colour	Status	Description
D2 *		OFF	Diagnostic disabled
	RED	ON	Station / module bus communication failure
	RED	FLASHING (0.5Hz)	Summarized diagnostic
AI channels 0...3		OFF	Channel disabled
	GREEN	ON	Channel active
	GREEN	FLASHING (0.5 Hz)	Measuring range undershoot
	GREEN	FLASHING (4 Hz)	Measuring range overshoot
AO channels 4...7			Without function (no LEDs for analog outputs)

* The D2 LED also indicates gateway diagnosis

BL compact Multiprotocol Station for Industrial Ethernet
8 Analog Current or Voltage Inputs and 8 Analog Voltage Outputs
BLCEN-8M12LT-4AI4AO-VI-4AI4AO-VI

Process Data Mapping of the Single Protocols

EtherNet/IP™ I/O and Diagnostic 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	Replacement station	-	Diagnostics active	-	-	-	-	-
Slot X* (ref. byte 16)	18	Hardware error	-	-	-	AI X ₀ overflow/underflow	-	Wire break AI X ₀ (4...20 mA range only)	Range error AI X ₀
	19	Hardware error	-	-	-	AO X ₀ overflow/underflow	-	-	Range error AO X ₀
	20	Hardware error	-	-	-	AI X ₁ overflow/underflow	-	Wire break AI X ₁ (4...20 mA range only)	Range error AI X ₁
	21	Hardware error	-	-	-	AO X ₁ overflow/underflow	-	-	Range error AO X ₁
	22	Hardware error	-	-	-	AI X ₂ overflow/underflow	-	Wire break AI X ₂ (4...20 mA range only)	Range error AI X ₂
	23	Hardware error	-	-	-	AO X ₂ overflow/underflow	-	-	Range error AO X ₂
	24	Hardware error	-	-	-	AI X ₃ overflow/underflow	-	Wire break AI X ₃	Range error AI X ₃
	25	Hardware error	-	-	-	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							

* If both slots of the module are diagnosable, the display of continuous diagnostic (scheduled diagnostic) switches every 125 ms between slot 1 and 2.

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
7 / 10	Hans Turck GmbH & Co. KG, P-45472 Mülheim an der Ruhr, Witzlebenstraße 7, Tel. 0208 4952-0, Fax 0208 4952-269, info@turck.com, www.turck.com															

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

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	-	-	-	-	OFUAI 1 ₁	SCAI 1 ₁	WBAI 1 ₁	MRAI 1 ₁	-	-	-	-	OFUAI 1 ₀	SCAI 1 ₀	WBAI 1 ₀	MRAI 1 ₀	
	0xA001	-	-	-	-	OFUAI 1 ₃	SCAI 1 ₃	WBAI 1 ₃	MRAI 1 ₃	-	-	-	-	OFUAI 1 ₂	SCAI 1 ₂	WBAI 1 ₂	MRAI 1 ₂	
	0xA002	-	-	-	-	OFUAC 1 ₁	SCAO 1 ₁	WBAO 1 ₁	MRAO 1 ₁	-	-	-	-	OFUAC 1 ₀	SCAO 1 ₀	WBAO 1 ₀	MRAO 1 ₀	
	0xA003	-	-	-	-	OFUAC 1 ₃	SCAO 1 ₃	WBAO 1 ₃	MRAO 1 ₃	-	-	-	-	OFUAC 1 ₂	SCAO 1 ₂	WBAO 1 ₂	MRAO 1 ₂	
	0xA004	-	-	-	-	OFUAI 2 ₁	SCAI 2 ₁	WBAI 2 ₁	MRAI 2 ₁	-	-	-	-	OFUAI 2 ₀	SCAI 2 ₀	WBAI 2 ₀	MRAI 2 ₀	
	0xA005	-	-	-	-	OFUAI 2 ₃	SCAI 2 ₃	WBAI 2 ₃	MRAI 2 ₃	-	-	-	-	OFUAI 2 ₂	SCAI 2 ₂	WBAI 2 ₂	MRAI 2 ₂	
	0xA006	-	-	-	-	OFUAC 2 ₁	SCAO 2 ₁	WBAO 2 ₁	MRAO 2 ₁	-	-	-	-	OFUAC 2 ₀	SCAO 2 ₀	WBAO 2 ₀	MRAO 2 ₀	
	0xA007	-	-	-	-	OFUAC 2 ₃	SCAO 2 ₃	WBAO 2 ₃	MRAO 2 ₃	-	-	-	-	OFUAC 2 ₂	SCAO 2 ₂	WBAO 2 ₂	MRAO 2 ₂	

PROFINET® Process Data

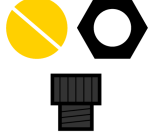
	BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Eingänge	0	AI 1 ₀ LSB							
	1	AI 1 ₀ MSB							
	2	AI 1 ₁ LSB							
	3	AI 1 ₁ MSB							
	4	AI 1 ₂ LSB							
	5	AI 1 ₂ MSB							
	6	AI 1 ₃ LSB							
	7	AI 1 ₃ MSB							
	8	AI 2 ₀ LSB							
	9	AI 2 ₀ MSB							
	10	AI 2 ₁ LSB							
	11	AI 2 ₁ MSB							
	12	AI 2 ₂ LSB							
	13	AI 2 ₂ MSB							
	14	AI 2 ₃ LSB							
15	AI 2 ₃ MSB								
Ausgänge	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								

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10	AO 2, LSB
11	AO 2, MSB
12	AO 2, LSB
13	AO 2, MSB
14	AO 2, LSB
15	AO 2, 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	