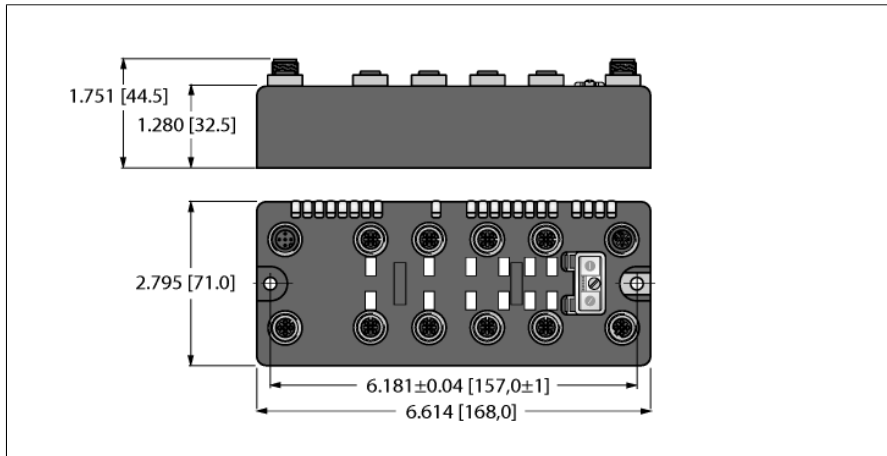


**BL compact™ multiprotocol fieldbus station for Industrial Ethernet
8 Analog Inputs for Thermocouple Elements
BLCEN-8M12LT-4AI-TC-4AI-TC**

- 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 Thermo Couples
- Types B, C, E, G, J, K, N, R, S or T (selectable per channel)
- Cold-junction compensation via a Pt1000 in special connector

Type designation	BLCEN-8M12LT-4AI-TC-4AI-TC
Ident-No.	6811478
Ident-No (TUSA)	F6811478
Nominal system voltage	24 VDC
System power supply	Via auxiliary power
Voltage supply connection	2 x M12, 5-pin
Admissible range Vi	18...30VDC
Nominal current Vi	185 mA
Max. current Vi	2 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...99 (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	11478
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)
EtherNet/IP™	
Addressing	acc. to EtherNet/IP™ specification
Device Level Ring (DLR)	supported
Number of CIP connections	6
Input Assembly Instance	103
Input Data Size	11 INT
Output Assembly Instance	104
Output Data Size	1 INT
Configuration Assembly Instance	106
Configuration Size	0
Comm Format	Data - INT

BL compact™ multiprotocol fieldbus station for Industrial Ethernet
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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

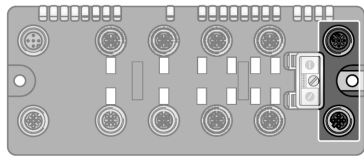
Analog inputs

Operating modes	Types B, C, E, G, J, K, N, R, S, T
Type of input diagnostics	Channel diagnostics
Sensor supply	24 VDC, 1 amp max.
Input resistance	> 7 MΩ
Voltage resolution	± 50 mV: < 2 µV ± 100 mV: < 4 µV ± 500 mV: < 20 µV ± 1000 mV: < 50 µV
Maximum limiting frequency analog	< 70 Hz
Basic fault limit at 23 °C	< 0.2 %
Repeatability	< 0.05 %
Temperature coefficient	< 300 ppm / °C of full scale
Resolution	16 bit
Measurement display	16 bit signed integer 12 bit full range left-justified

Dimensions

Operating temperature	168 x 71 x 32.5 mm -40...+70 °C
Storage temperature	-40...+85 °C
Relative humidity	15 to 95% (non-condensing)
Vibration test	according to IEC 61131-2
Extended vibration resistance	
- up to 20 g (at 10 up to 150 Hz)	For mounting on base plate or machinery
Shock test	according to IEC 61131-2
Electro-magnetic compatibility	according to IEC 61131-2
Protection class	IP67 IP69K
Housing material	Glass-filled nylon, nickel plated brass connectors
Housing colour	Black
Window material	Lexan
Material screw	Nickel-plated brass
Label material	Polyester with Polycarbonate overlay
Ground tab material	Nickel plated brass
Weight	620 ± 20 g
Approvals and certificates	CE, cULus

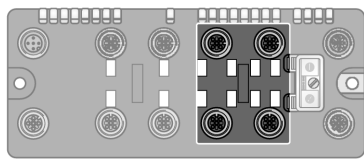
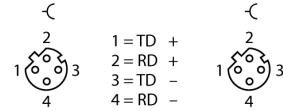
Pinning and wiring diagram



Ethernet

Fieldbus cable (example): RSSD RSSD 441-2M ident-no. U-02482
or RSSD-RSSD-441-2M/S2174 ident-no. 6914218

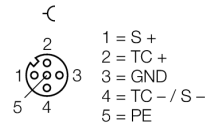
Pin Assignment (M12, D-code)



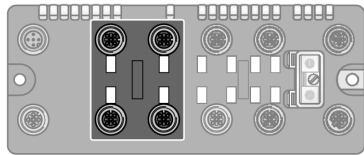
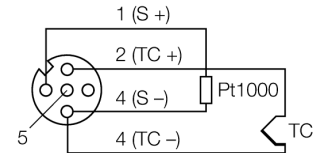
Slot 1: Thermocouple Inputs

TC compensating connector BL67-WAS5-THERMO ident-no. 6827197

Pin Assignment



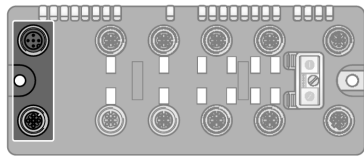
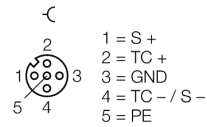
Wiring Diagram



Slot 2: Thermocouple Inputs

See slot 1

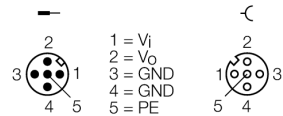
Pin Assignment



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 fieldbus station for Industrial Ethernet
8 Analog Inputs for Thermocouple Elements
BLCEN-8M12LT-4AI-TC-4AI-TC**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
MS		OFF	Power Off
	GREEN	ON	Connected to Master
	GREEN	FLASHING	Ready
	RED	ON	Error
	RED	FLASHING	DHCP/BOOTP Search
LNK/ACT		OFF	No Link
	GREEN	ON	100MBit Linked
	YELLOW	ON	Link
	YELLOW	FLASHING	Traffic

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 channel 0 / 1	AI channel 2 / 3		Not connected

* 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)

* D2 LED also indicates gateway diagnostics

BL compact™ multiprotocol fieldbus station for Industrial Ethernet

8 Analog Inputs for Thermocouple Elements

BLCEN-8M12LT-4AI-TC-4AI-TC

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	-	-	-	-	-	-	Open Circuit AI X ₀	Range Error AI X ₀
	19	-	-	-	-	-	-	Open Circuit AI X ₁	Range Error AI X ₁
	20	-	-	-	-	-	-	Open Circuit AI X ₂	Range Error AI X ₂
	21	-	-	-	-	-	-	Open Circuit AI X ₃	Range Error AI X ₃

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

Legend:

AI	Analog Input	OC	Open Circuit
CFG	Configuration Error	S1	Slot 1
COM	Communication Failure	S2	Slot 2
DIA	Diagnostics Active	SC	Short Circuit / Overcurrent
FCE	Force Mode Active	VI	VI Voltage
MR	Measurement Value Range Error	VO	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															
	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
I/O Diag. (RO)	0xA000	-	-	-	-	-	CJAI 1 ₁	OCAI 1 ₁	MRAI 1 ₁	-	-	-	-	-	CJAI 1 ₀	OCAI 1 ₀	MRAI 1 ₀
	0xA001	-	-	-	-	-	CJAI 1 ₃	OCAI 1 ₃	MRAI 1 ₃	-	-	-	-	-	CJAI 1 ₂	OCAI 1 ₂	MRAI 1 ₂
	0xA002	-	-	-	-	-	CJAI 2 ₁	OCAI 2 ₁	MRAI 2 ₁	-	-	-	-	-	CJAI 2 ₀	OCAI 2 ₀	MRAI 2 ₀
	0xA003	-	-	-	-	-	CJAI 2 ₃	OCAI 2 ₃	MRAI 2 ₃	-	-	-	-	-	CJAI 2 ₂	OCAI 2 ₂	MRAI 2 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							

BL compact™ multiprotocol fieldbus station for Industrial Ethernet
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BLCEN-8M12LT-4AI-TC-4AI-TC

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	