

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

Type designation	BLCEN-8M12LT-4IOL-4AI-VI
Ident no.	6811503
Nominal system voltage	24 VDC
System power supply	Via auxiliary power
Voltage supply connection	2 x M12, 5-pin
Admissible range Vi	20...30VDC
Nominal current Vi	177 mA
Max. current Vi	2 A
Admissible range Vo	20...30VDC
Nominal current Vo	80 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 ← M12 4-pin, D-coded
Protocol detection	automatic
Web server	Integrated
Service Interface	Ethernet
Vendor ID	48
Product type	12
Product code	11503
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. 13 register
Input register start address	0 (0x0000 hex)
Output Data Size	max. 7 register
Output register start address	2048 (0x0800 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	19 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. 24 BYTE
Output Data Size	max. 24 BYTE

Digital inputs

Input type	from 4IOL PNP
Low level signal voltage	< 5 V
High level signal voltage	> 11 V
Low level signal current	< 1.5 mA DI, < 5 mA SIO
High level signal current	2.1 ... 3.7 mA DI / 5 ... 11 mA SIO

Digital outputs

Output type	from 4IOL PNP
Sensor supply (V_{SENS})	24 VDC
Output current per channel	0,5 A
Output voltage	24 VDC
Output delay	3 ms
Load type	ohmsch, induktiv, Lampenlast
Load resistance, resistive	> 48 Ω
Load resistance, inductive	< 1.2 H
Lamp load	< 3 W
Switching frequency, resistive	< 200 Hz
Switching frequency, inductive	< 2 Hz
Switching frequency, lamp load	< 20 Hz
Short-circuit protection	yes

analog inputs

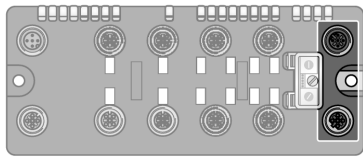
Input type	from 4AI-VI 0/4 ... 20 mA or -10/0 ... 10 VDC
Type of input diagnostics	Channel diagnostics
Sensor supply	24 VDC aus Versorgungsspannung
Input resistance	Strom: < 0,125 K Ω , Voltage: < 98.5 K Ω
Maximum limiting frequency analog	< 20 Hz
Basic fault limit at 23 °C	< 0.3 %
Repeatability	< 0.05 %
Temperature coefficient	< 300 ppm / °C v.E.
Resolution	16 Bit
Measuring principle	Sigma Delta
Measured-value display	16 bit signed integer 12 bit full range left justified

Technology

Signal type	IO-Link
Electrical isolation	Electronics and field level isolated via optocouplers

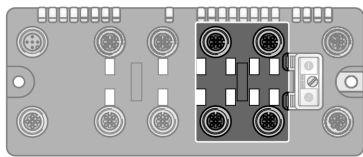
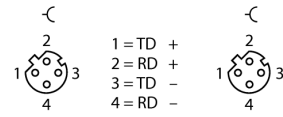
BL compact Multiprotocol Station for Industrial Ethernet
4 IO-Link Channels and 4 Analog Current or Voltage Inputs
BLCEN-8M12LT-4IOL-4AI-VI

Dimensions	168 x 71 x 32.5 mm
Operating temperature	-40...+70 °C
Storage temperature	-40...+85 °C
Relative humidity	15 to 95% (non-condensing)
Vibration test	acc. 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	acc. to IEC 61131-2
Electro-magnetic compatibility	acc. to IEC 61131-2
Protection class	IP67
	IP69K
Housing material	Glass fiber reinforced nylon, nickel-plated connector
Housing color	Black
Window material	Lexan
Material screw	Nickel-plated brass
Material label	Polyester with polycarbonate overlay
Ground tab material	Nickel-plated brass
Weight	620 ± 20 g
Approvals and certificates	CE, cULus



Ethernet

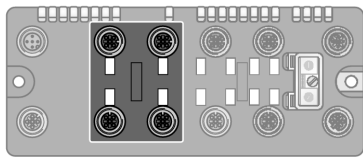
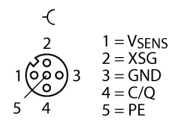
Fieldbus cable (IP67 example): RSSD RSSD 441-2M ID number U-02482 or RSSD-RSSD-441-2M/S2174 ID number 6914218



Slot 1: IO-Link channels

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

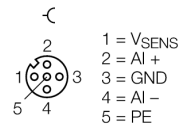
Pin Assignment



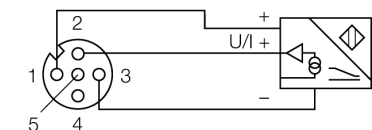
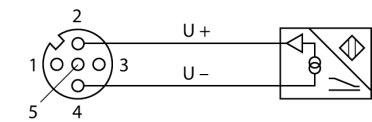
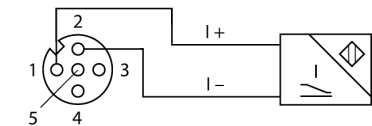
Slot 2: Analog Inputs

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

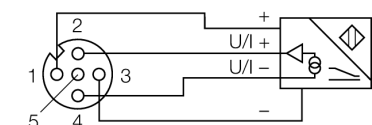
Pin Assignment



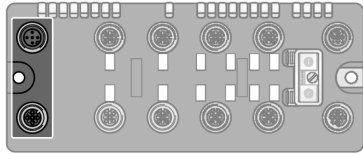
2-wire Connection (current)



4-wire connection technology

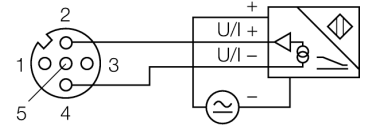


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Auxiliary Power

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



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
I/O link mode channels 1 ₀ ...1 ₃		OFF	Channel status x = "0" (OFF) no active diagnostics
	GREEN	Flashing	IO-Link communication, process data valid
	RED	ON	No I/O link communication
		Flashing	Process data invalid
DI mode channels 1 ₀ ...1 ₃		OFF	Channel status x = 0 (OFF)
	GREEN	ON	Channel status x = 1 (ON)
XSG 1 ₀ ...1 ₇		OFF	Channel status x = 0 (OFF)
	GREEN	ON	Channel status x = 1 (ON)

* 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 2 ₀ ...2 ₃		OFF	Not active
	GREEN	ON	Active
	GREEN	FLASHING (0.5 Hz)	Underflow in measuring range
	GREEN	FLASHING (4 Hz)	Overflow in measuring range

* The D2 LED also indicates gateway diagnosis

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	
Digital	0	DI 1 ₇	DI 1 ₆	DI 1 ₅	DI 1 ₄	DI 1 ₃	DI 1 ₂	DI 1 ₁	DI 1 ₀	
	1	OCDO 1 ₇	OCDO 1 ₆	OCDO 1 ₅	OCDO 1 ₄	DVS 1 ₃	DVS 1 ₂	DVS 1 ₁	DVS 1 ₀	
	2...15	IO-Link Daten lesen (je nach Einstellung der Parameter)								
AI 2 ₀	16	AI 2 ₀ LSB								
	17	AI 2 ₀ MSB								
AI 2 ₁	18	AI 2 ₁ LSB								
	19	AI 2 ₁ MSB								
AI 2 ₂	20	AI 2 ₂ LSB								
	21	AI 2 ₂ MSB								
AI 2 ₃	22	AI 2 ₃ LSB								
	23	AI 2 ₃ MSB								
Diagnose	24	Modulnummer meldet Diagnose Daten								
	25	Austauschstation	-	Diagnose aktiv	-	-	-	-	-	
Steckplatz X (Ref. Byte 24)	26	IOL 1 ₀ EVT2	IOL 1 ₀ EVT1	IOL 1 ₀ PDINV	IOL 1 ₀ HWER	IOL 1 ₀ DSER	IOL 1 ₀ CFGER	-	OCDO 1 ₄	
	27	IOL 1 ₀ GENER	IOL 1 ₀ OVL	IOL 1 ₀ VHIGH	IOL 1 ₀ VLOW	IOL 1 ₀ ULVE	IOL 1 ₀ LLVU	IOL 1 ₀ OTMP	IOL 1 ₀ PRMER	
	28	IOL 1 ₁ EVT2	IOL 1 ₁ EVT1	IOL 1 ₁ PDINV	IOL 1 ₁ HWER	IOL 1 ₁ DSER	IOL 1 ₁ CFGER	-	OCDO 1 ₅	
	29	IOL 1 ₁ GENER	IOL 1 ₁ OVL	IOL 1 ₁ VHIGH	IOL 1 ₁ VLOW	IOL 1 ₁ ULVE	IOL 1 ₁ LLVU	IOL 1 ₁ OTMP	IOL 1 ₁ PRMER	
	30	IOL 1 ₂ EVT2	IOL 1 ₂ EVTX	IOL 1 ₂ PDINV	IOL 1 ₂ HWER	IOL 1 ₂ DSER	IOL 1 ₂ CFGER	-	OCDO 1 ₆	
	31	IOL 1 ₂ GENER	IOL 1 ₂ OVL	IOL 1 ₂ VHIGH	IOL 1 ₂ VLOW	IOL 1 ₂ ULVE	IOL 1 ₂ LLVU	IOL 1 ₂ OTMP	IOL 1 ₂ PRMER	
	32	IOL 1 ₃ EVT2	IOL 1 ₃ EVTX	IOL 1 ₃ PDINV	IOL 1 ₃ HWER	IOL 1 ₃ DSER	IOL 1 ₃ CFGER	-	OCDO 1 ₇	
	33	IOL 1 ₃ GENER	IOL 1 ₃ OVL	IOL 1 ₃ VHIGH	IOL 1 ₃ VLOW	IOL 1 ₃ ULVE	IOL 1 ₃ LLVU	IOL 1 ₃ OTMP	IOL 1 ₃ PRMER	
	34	-	-	-	-	-	-	-	Offener Stromkreis AI 2 ₀	Bereichsfehler AI 2 ₀
	35	-	-	-	-	-	-	-	Offener Stromkreis AI 2 ₁	Bereichsfehler AI 2 ₁
36	-	-	-	-	-	-	-	Offener Stromkreis AI 2 ₂	Bereichsfehler AI 2 ₂	
37	-	-	-	-	-	-	-	Offener Stromkreis AI 2 ₃	Bereichsfehler AI 2 ₃	
OUTPUT	BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Digital	0	DO 1 ₇	DO 1 ₆	DO 1 ₅	DO 1 ₄	-	-	-	-	
	1	-	-	-	-	-	-	-	-	
	2...15	IO-Link Daten schreiben (je nach Einstellung der Parameter)								

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

Legend

GENER	Common error	EVT1	Maintenance Events
VHIGH	Overvoltage	HWER	Hardware Error
ULVE	Upper Limit Value Exceeded	CFGER	Wrong or Missing Device
OTMP	Overtemperature	DVS	Data Valid Signal
EVT2	Out of Specification Error	OC	Over Current
PDINV	Process input data invalid	DIAG	Diagnostics

DSER	Data Storage Error	DO	Digital Output
OVL	Overload	DI	Digital Input
VLOW	Undervoltage	COM	Communication Lost Bit
LLVU	Lower Limit Value Underrun	CFG	Configuration Error
PRMER	Parameterization Error		

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
Eingänge (RO)	0x0000	OCDO ₁₇	OCDO ₁₆	OCDO ₁₅	OCDO ₁₄	DVS ₁₃	DVS ₁₂	DVS ₁₁	DVS ₁₀	DI ₇	DI ₆	DI ₅	DI ₄	DI ₃	DI ₂	DI ₁	DI ₀
	0x0001... 0x0007	IO-Link Daten lesen (je nach Einstellung der Parameter)															
	0x0008	AI ₂															
	0x0009	AI ₂															
	0x000A	AI ₂															
	0x000B	AI ₂															
Status (RO)	0x000C	-	FCE	-	-	CFG	COM	VI low	VI high	VO low	VO high	OCVI	-	-	-	-	DIAG
Diag. (RO)	0x000D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S2 DIAG	S1 DIAG
Ausgänge (RW)	0x0800	-	-	-	-	-	-	-	-	DO ₇	DO ₆	DO ₅	DO ₄	-	-	-	-
	0x0801... 0x0807	IO-Link Daten schreiben (je nach Einstellung der Parameter)															
I/O Diag (RO)	0xA000	IOL ₁₀ GEN- ER	IOL ₁₀ OVL	IOL ₁₀ VHIGH	IOL ₁₀ VLOW	IOL ₁₀ ULVE	IOL ₁₀ LLVU	IOL ₁₀ OTMP	IOL ₁₀ PRMER	IOL ₁₀ EVT2	IOL ₁₀ EVT1	IOL ₁₀ PDINV	IOL ₁₀ HWER	IOL ₁₀ DSER	IOL ₁₀ CFGER	-	OC DO ₁₄
	0xA001	IOL ₁₁ GEN- ER	IOL ₁₁ OVL	IOL ₁₁ VHIGH	IOL ₁₁ VLOW	IOL ₁₁ ULVE	IOL ₁₁ LLVU	IOL ₁₁ OTMP	IOL ₁₁ PRMER	IOL ₁₁ EVT2	IOL ₁₁ EVT1	IOL ₁₁ PDINV	IOL ₁₁ HWER	IOL ₁₁ DSER	IOL ₁₁ CFGER	-	OC DO ₁₅
	0xA002	IOL ₁₂ GEN- ER	IOL ₁₂ OVL	IOL ₁₂ VHIGH	IOL ₁₂ VLOW	IOL ₁₂ ULVE	IOL ₁₂ LLVU	IOL ₁₂ OTMP	IOL ₁₂ PRMER	IOL ₁₂ EVT2	IOL ₁₂ EVT1	IOL ₁₂ PDINV	IOL ₁₂ HWER	IOL ₁₂ DSER	IOL ₁₂ CFGER	-	OC DO ₁₆
	0xA003	IOL ₁₃ GEN- ER	IOL ₁₃ OVL	IOL ₁₃ VHIGH	IOL ₁₃ VLOW	IOL ₁₃ ULVE	IOL ₁₃ LLVU	IOL ₁₃ OTMP	IOL ₁₃ PRMER	IOL ₁₃ EVT2	IOL ₁₃ EVT1	IOL ₁₃ PDINV	IOL ₁₃ HWER	IOL ₁₃ DSER	IOL ₁₃ CFGER	-	OC DO ₁₇
	0xA004	IOL ₂₀ GEN- ER	IOL ₂₀ OVL	IOL ₂₀ VHIGH	IOL ₂₀ VLOW	IOL ₂₀ ULVE	IOL ₂₀ LLVU	IOL ₂₀ OTMP	IOL ₂₀ PRMER	IOL ₂₀ EVT2	IOL ₂₀ EVT1	IOL ₂₀ PDINV	IOL ₂₀ HWER	IOL ₂₀ DSER	IOL ₂₀ CFGER	-	OC DO ₂₄
	0xA005	IOL ₂₁ GEN- ER	IOL ₂₁ OVL	IOL ₂₁ VHIGH	IOL ₂₁ VLOW	IOL ₂₁ ULVE	IOL ₂₁ LLVU	IOL ₂₁ OTMP	IOL ₂₁ PRMER	IOL ₂₁ EVT2	IOL ₂₁ EVT1	IOL ₂₁ PDINV	IOL ₂₁ HWER	IOL ₂₁ DSER	IOL ₂₁ CFGER	-	OC DO ₂₅

PROFINET® Process Data

Eingänge	0	DI ₇	DI ₆	DI ₅	DI ₄	DI ₃	DI ₂	DI ₁	DI ₀
	1	OCDO ₁₇	OCDO ₁₆	OCDO ₁₅	OCDO ₁₄	DVS ₁₃	DVS ₁₂	DVS ₁₁	DVS ₁₀
	2...15	IO-Link Daten lesen (je nach Einstellung der Parameter)							
AI ₂₀	16	AI ₂₀ LSB							
	17	AI ₂₀ MSB							
AI ₂₁	18	AI ₂₁ LSB							
	19	AI ₂₁ MSB							
AI ₂₂	20	AI ₂₂ LSB							
	21	AI ₂₂ MSB							
AI ₂₃	22	AI ₂₃ LSB							
	23	AI ₂₃ MSB							
Ausgänge	0	DO ₇	DO ₆	DO ₅	DO ₄	-	-	-	-
	1	-	-	-	-	-	-	-	-
	2...15	IO-Link Daten schreiben (je nach Einstellung der Parameter)							