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PB00041AG

LioN-Power Active I/O Modules

New multi-protocol I/O modules from Lumberg Automation meet EtherNet/IP and PROFINET protocols and detect both input and output data directly on the machine, saving engineers both time and money with an all-in-one solution for the Industrial Internet of Things (IIoT).

The fully potted, compact I/O modules deliver exceptional flexibility and convenient installation in the field for a variety of industrial automation applications. Plus, they meet IP65 and IP67 ratings for protection against dust, water jets and temporary immersion in water.

- **Flexibility –** IO-Link Master, with Class A and B ports, provides 8 IO-Link ports, which can be configured as either IO-Link (max. 8), digital inputs (DI, max. 12) or digital output (DO, max. 8)

- **Easy installation –** L-coded M12 power ports with compact design and optimized arrangement simplify plant installation and give engineers more options for connecting additional Lumberg Automation LioN-Power products

- **Cost efficiency –** multi-protocol solution, combined with L-coded M12 power connectors, creates long- and short-term cost savings

Previously, engineers who wanted to take advantage of the Industrial Internet of Things (IIoT) needed both PROFINET and EtherNet/IP modules, which required two products with very different power components – 4-pole 7/8" power for EtherNet/IP and 5-pole 7/8" power for PROFINET devices, even as multi-protocol devices. With the new LioN-Power active I/O modules, engineers only need one module to meet both protocols, which can be used in conjunction with the corresponding standardized L-coded M12 power connectors for high cost efficiency.

Applications

The new LioN-Power active I/O modules are fit for a variety of industrial production applications, including robotics, manufacturing, material handling, food and beverage, packaging, and automotive settings.

Specifying, design, control and process engineers, along with contractors, installers and system integrators, will benefit from the product's ability to meet both EtherNet/IP and PROFINET protocols. This is a complete, all-in-one product portfolio for data communication.

Your Benefits

The reduced weight and size of the new LioN-Power active I/O modules, combined with a robust IP67 rating, enables the device to be installed directly on machinery, reducing excess wiring costs.

Standardized cabling and IO-Link interfaces offer enhanced security and comprehensive diagnostic functions, such as a live illustration feature and the ability to parameterize or exchange devices during operation, which leads to quick and simple troubleshooting and reduced network downtime.

A new product to serve your needs.
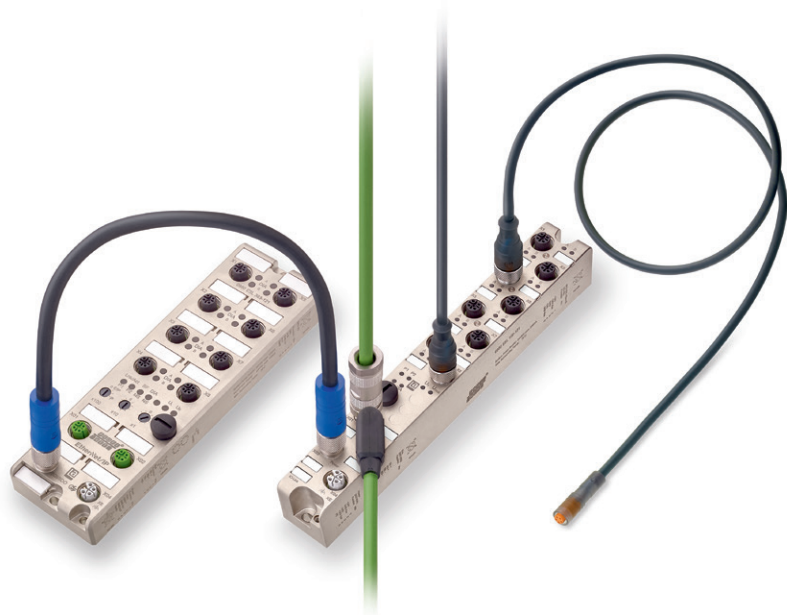## Be certain.

LioN-Power Active I/O Modules

The new LioN-Power active I/O modules deliver the highest application flexibility. Designed to meet the trend toward miniaturization, the new modules are smaller and lighter, bringing optimal performance while reducing costs and required resources.

The new LioN-Power active I/O modules also meet application-specific regulations, including UL 61010-1 (replaces UL 508) certification for safe implementation of electrical test and measurement equipment. The modules can be used with other Belden products, including the M12 power cordsets, 7/8" cordsets, and the M8/M12 cordset portfolio, as well as the mounting adapter.

Benefits at a Glance

- Selectable power connection: 7/8" and M12 Power (L-coded with up to 16 A)
- Exceptionally compact design and up to 50% lighter than competitive products
- Fully-potted metal housing for highest durability and density
- Dust-tight and protected against water jets (IP65) and temporary immersion (IP67)
- Superior operational temperature range: -20 °C to +70 °C
- Resistant to welding sparks due to special surface coating
- Hardened against vibration (15 g) and shock (50 g)
- UL 61010-1 (replaces UL 508) certified
- Multi-protocol support for PROFINET V2.3 (Conformance Class C) and EtherNet/IP
- Available in four signal variants: 16 digital inputs, 16 digital outputs, 8 digital inputs and 8 outputs, or 8 IO-Link ports (4 x Type A and 4 x Type B)
- More signal freedom (intelligent sensors, analog, hubs, valves, ...) thanks to IO-Link v1.1
- Digital outputs with up to 2 A per port, short-circuit proof and galvanically isolated
- Integrated web server for information, configuration and diagnostics
- Comprehensive and channel-specific diagnostic & status LEDs
- 2 x M12 Ethernet ports with switch functionality for line topology
- Universal mounting adapters (screw-on) make it simple to upgrade
- Standardized interfaces

High performance in smaller and lighter design for the highest application flexibility.

Technical Information

Product Description			
Type	0980 ESL 1xx-121	0980 ESL 3xx-121	0980 ESL 3xx-111
Description	LioN-P PROFINET device, 4 digital input channels, 8 IO-Link channels, M12 LAN connection, 4-poles, D-coded, M12 L-coded power supply, 5-poles, 30 mm housing	LioN-P PROFINET/EtherNet/IP or Multi-protocol module, PROFINET or EtherNet/IP device, 16 digital input channels/16 digital output channels with galvanic isolation, M12 LAN connection, 4-poles, D-coded, M12 L-coded power supply, 5-poles	LioN-P PROFINET/EtherNet/IP or Multi-protocol module, PROFINET or EtherNet/IP device, 16 digital input channels/16 digital output channels with galvanic isolation or 8 digital input and 8 digital output channels with galvanic isolation, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 4 or 5-poles

Technical Data	
Environmental Temperature	-20 °C to +70 °C (Operation)
Housing Material	Metal (Zinc Die-cast)

Mechanical Data			
Weight	480 g	500 g	520 g
Protection Class	IP65, IP67		

Module Supply			
Rated Voltage	24 V DC		
Voltage Range	19 to 30 V DC		
Nominal Current	16 A		9 A
Connection Type	M12 Power, 5-poles, L-coded		PROFINET: 7/8", 5-poles; EtherNet/IP: 7/8", 4-poles
Number	2		

Bus System			
Network	PROFINET	PROFINET, EtherNet/IP, Multi-protocol	
Transmission Rate	10/100 Mbit/s		
Address Range	–	0 to 255 (not applicable for pure PROFINET modules)	
Connection Type	M12 LAN connection, 4-poles, D-coded		
Number	2		

I/O Variant	8IOL	16DI	8DI/8DO	16DO	8IOL	16DI	8DI/8DO	16DO
Outputs								
Number of Digital Channels	max. 8 via C/Q	–	8	16	max. 8 via C/Q	–	8	16
Actoric Current	500 mA	–	2 A per channel		500 mA	–	2 A per channel	
Actoric Current (max.)	9 A	–	9 A		9 A	–	9 A	
Short-circuit Proof	yes	–	yes		yes	–	yes	
Channel Type N.O.	p-switching	–	p-switching	p-switching	–	p-switching		
Status Indicator	LED white or yellow per channel	–	LED white or yellow per channel		–	LED white or yellow per channel		
Diagnostic Indicator	LED red per port	–	LED red per port		–	LED red per port		
Inputs								
Number of Digital Channels	4 + max. 8 via C/Q	16	8	–	4 + max. 8 via C/Q	16	8	–
Type	Type 1 acc. IEC 61131-2	Type 3 acc. IEC 61131-2		–	Type 1 acc. IEC 61131-2	Type 3 acc. IEC 61131-2		–
Sensor Type	PNP		–	PNP		PNP		–
Status Indicator	LED white or yellow per channel		–	LED white or yellow per channel	LED white or yellow per channel		–	
Diagnostic Indicator	LED red per port		–	LED red per port	LED red per port		–	
Sensor Current Supply	200 mA per port		–	200 mA per port	200 mA per port		–	
IO-Link								
Number of IO-Link Channels	8	–	–	–	8	–	–	–
Number of A Ports	4	–	–	–	4	–	–	–
Number of B Ports	4	–	–	–	4	–	–	–
Nominal Current C/Q (Pin 4)	500 mA	–	–	–	500 mA	–	–	–
Nominal Current L+/L- (Pin 1 and 3)	200 mA	–	–	–	200 mA	–	–	–
Nominal Current Ua (Type B Ports, Pin 2 and 5)	2 A	–	–	–	2 A	–	–	–
Short-circuit Proof	yes	–	–	–	yes	–	–	–
Cable Length to Sensor	< 20m	–	–	–	< 20m	–	–	–

Order Information

Type	0980 ESL 1xx-121	0980 ESL 3xx-121				0980 ESL 3xx-111		
Power Variant	M12 L-coded	M12 L-coded				7/8"		
I/O Variant	8IOL	16DI	8DI/8DO	16DO	8IOL	16DI	8DI/8DO	16DO
PROFINET	934861001	934878001	934878003	934878002	934878004	934881001	934881003	934881002
EtherNet/IP	in 2016	934839001	934839003	934839002	in 2016	934880001	934880003	934880002
Multi-protocol	in 2016	934879001	934879003	934879002	in 2016	934882001	934882003	934882002

Technical Drawings

0980 ESL 109-121
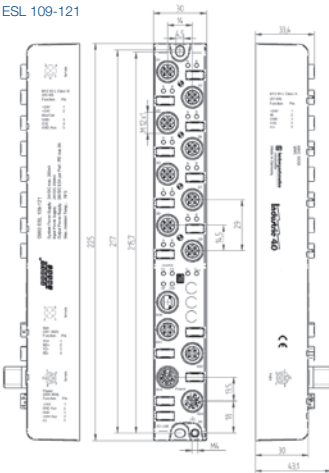
0980 ESL 311-121
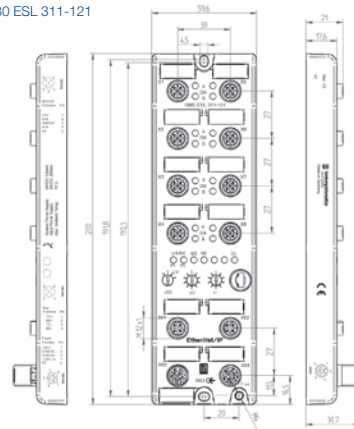
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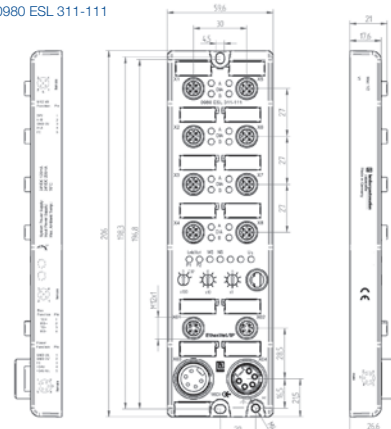
Always Stay Ahead with Belden

In a highly competitive environment, it is crucial to have reliable partners who are able to add value to your business. When it comes to signal transmissions, Belden is the No. 1 solutions provider. We understand your business and want to know your specific challenges and targets to see how effective signal transmission solutions can push you ahead of the competition. By combining the strengths of our five leading brands, Belden, GarrettCom, Hirschmann, Lumberg Automation and Tofino Security, we are able to offer the solution you need. Today, it may be a single cable, a switch or a connector, thus solving a specific issue; tomorrow, it can be a complex range of integrated applications, systems and solutions.

Phone: **1.800.BELDEN.1**   **www.lumberg-automationusa.com**

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M12 Power Connector

The latest offering of Lumberg Automation M12 connectors is an efficient way to transmit power for long periods of time in harsh conditions.

The M12 Power connector's compact design and high power transmission make it a cost-effective solution for operations that need a reliable, flexible connector. The M12 Power allows for continuous operations in the harshest environments thanks to new technology that works excellent in high temperatures.

- **Secure –** outstanding performance in power transmission while fulfilling global standards (UL, VDE). The M12 Power is designed according to DIN EN 61076-2-111.
- **Operational reliability –** transmitting high power even at high ambient temperatures, due to a higher derating grants high up time in production.
- **Efficient –** small size allows highest flexibility in planning your application and saving space while providing cost-effective connectivity. Colored contact bearer makes it easy to identify the codings to speed up installation time.

The M12 Power connector is S-, L-, K- and T-coded and is suitable for connecting drives, control, sensing and actuators in automation control systems.

Applications

The M12's K- and S- coding is designed for AC power supplies with 630 V AC/16 A, making it the ideal solution for AC motors and drive for power connections, frequency inverters, motor control switches, auxiliary power distribution for control systems, and direct wiring of LED and conventional lighting fixture systems.

The L- and T-coding versions are designed for DC power supplies with 63 V DC/16 A, which works well for low-voltage supplies, such as power supplies for I/O boxes, fieldbus Ethernet components, network devices, motors and drives, and direct wiring of LED and conventional lighting fixture systems.

Its small size makes it suitable for applications that require little space, like automotive, manufacturing and machine building for power transmission.

Your Benefits

The M12 Power connector is optimal suited when transmitting high power in space restricted areas. The high voltage and currents ratings combined with the high derating in harsh environmental conditions make this product portfolio unique among the products available on the market. This low-maintenance connector is installation friendly and available in all variants (attachable, molded, receptacle), straight as well as angled. Its easy handling results in increased efficiency and productivity.

A new product to serve your needs.
Be certain.

M12 Power Connectors

The M12 Power Connector features the well-known and proven Lumberg Automation M12 technology, meeting all the requirements for higher power consumption of control, sensing and actuators in automation control systems. Its four different codings fulfill the needs of several applications, while preventing mismatching connectors with different voltages.

The new generation meets the industry demand for miniaturized connectivity solutions. Especially Lumberg Automation's LioN-Power active I/O modules combined with innovative M12 Power L-coded technology and M8 5-pole B-coded cordsets provide complete connection solution with reduced weight and size needed for installation. Further, it enables a reduction of stock and maintenance costs due to multiprotocol I/O modules with standardized M12 Power connection.

Benefits at a Glance

- Complete product portfolio - one stop shop solution
- Ratings 16 A up to 630 V
- Optional 360° shielding available
- Temperature range -40 °C to +125 °C
- Conductor size 1.5 mm² and 2.5 mm² (L&K)
- Crimp technology and screw technology
- Protection class IP65, IP67, IP69K
- Colored contact bearer for easy identification of the coding
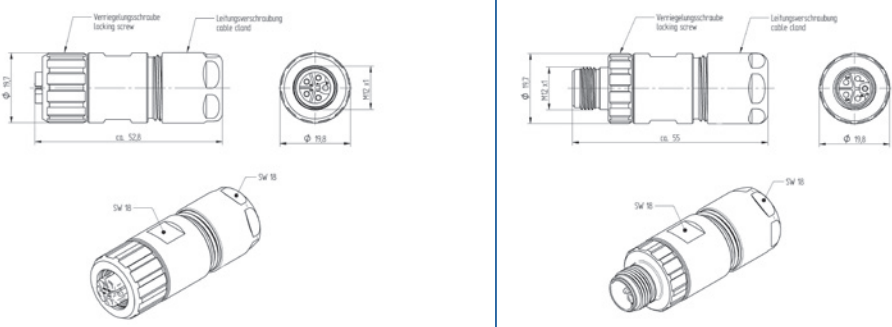- Cable outlet up to 11 mm

RKCC 5L/11 5-9 (female connector)

RSCC 5L/11 5-9 (male connector)

M12 Power technology in four different codings fulfill the needs of several applications.

RST(S) 4S-RKT(S) 4S

RST(S) 5L-RKT(S) 5L

RST(S) 5K-RKT(S) 5K

RST(S) 4T-RKT(S) 4T

Technical Information

Product Description

Type	RK(W)T(S) …/… M	RS(W)T(S) …/… M
Description	M12 female shielded/unshielded connector with threaded joint and molded cable, knurled nut with self-locking threaded joint, 360° shielding connected to knurled nut	M12 male shielded/unshielded connector with threaded joint and molded cable, knurled nut with self-locking threaded joint, 360° shielding connected to knurled nut
RoHS-compliant (2011/65/EU)	–	
(Construction Type) Standard	IEC 61076-2-111; S-, L-, K- or T-coded	
Approvals	UL/VDE	

Technical Data

Ambient Temperature	-40 °C to +125 °C
Housing Material/Grip	TPE
Contact Holder Material	PBT GF
Contact Material/Surface Finish	Cu/Au
Screw Coupling Material	CuZn

Mechanical Data

Degree of Protection	IP65, IP67, IP69K

Electrical Data

Contact Resistance	≤10 mΩ
Rated Voltage	630 V: S and K-coding; 63 V: L and T-coding
Rated Current	16 A: 1.5 mm² and 2.5 mm²; 10 A: 0.75 mm²
Pollution Degree	3 acc. to DIN EN 60664-1 (VDE 0110-1)

Technical Drawing

Pin Assignment

	RKT(S) 4S…	RKT(S) 5L…	RKT(S) 5K…	RKT(S) 4T…
	1 = black 1 2 = black 2 3 = black 3 PE = green/yellow	1 = brown 2 = white 3 = blue 4 = black PE = green/yellow	1 = black 1 2 = black 2 3 = black 3 4 = black 4 PE = green/yellow	1 = brown 2 = white 3 = blue 4 = black
Coding	S	L	K	T
Number of Poles	4 (3 + PE)	5 (4 + PE)	5 (4 + PE)	4

Technical Information

Product Description

Type	RKC(W)C(S)	RSC(W)C(S)
Description	M12 female field attachable shielded/unshielded connector with self-locking threaded joint and knurled nut	M12 male field attachable shielded/unshielded connector with self-locking threaded joint and knurled nut
RoHS-compliant (2011/65/EU)	–	
(Construction Type) Standard	IEC 61076-2-111; S-, L-, K- or T-coded	
Approvals	UL, VDE	

Technical Data

Ambient Temperature	-40 °C to +125 °C
Housing Material/Grip	CuZn/Ni, die-cast
Contact Holder Material	PBT
Contact Material/Surface Finish	Cu/Au
Screw Coupling Material	CuZn/Ni

Mechanical Data

Degree of Protection	IP67

Electrical Data

Contact Resistance	≤3 mΩ
Rated Voltage	630 V: S and K-coding; 63 V: L and T-coding
Rated Current	16 A
Pollution Degree	3

Technical Drawing

Pin Assignment

	RKT(S) 4S...	RKT(S) 5L...	RKT(S) 5K...	RKT(S) 4T...
	1 = black 1 2 = black 2 3 = black 3 PE = green/yellow	1 = brown 2 = white 3 = blue 4 = black PE = green/yellow	1 = black 1 2 = black 2 3 = black 3 4 = black 4 PE = green/yellow	1 = brown 2 = white 3 = blue 4 = black
Coding	S	L	K	T
Number of Poles	4 (3 + PE)	5 (4 + PE)	5 (4 + PE)	4
Crimp Range	0.5 to 1.5 mm²; 20 to 16 AWG	0.75 to 2.5 mm²; 18 to 14 AWG	0.75 to 2.5 mm²; 18 to 14 AWG	0.5 to 1.5 mm²; 20 to 16 AWG

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M8 5-pole B-coded Cordsets

M8 5-pole B-coded cordsets are equipped with an extended power range and snap connection feature – ensuring high-performance reliability and making installation easy when available space is limited.
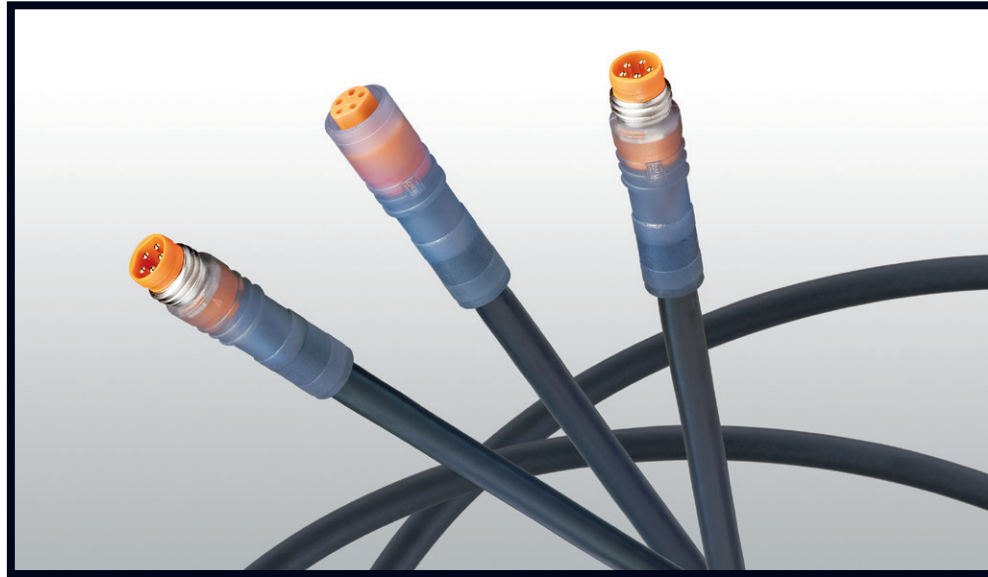
The industry-proven M8 technology offers outstanding handling characteristics while meeting to global industry standards, such as UL 2238* (Unterwriters Laboratories) and IEC 61076-2-104, delivering a high-performance solution ideal for small electronics applications.

- **Performance –** The M8 cordsets are designed to exceed current specifications according to IEC 61076-2-104 and reach a maximum of 4 amps of current and up to 63 V. These products allow for more then 2½ times as much power transmission as standard specifications.
- **Operational efficiency –** Space-saving M8 technology, in combination with the fast installation capability of the snap connection, make the M8 5-pole cordsets extremely efficient in regards to space and set-up time.
- **Convenience –** Snap and snap/thread attachment options deliver the highest flexibility and convenience in installation. Further, the high-quality design and standardized B-coding ensure a polarized connection that exceeds even the highest industry standards of IEC 61076-2-104.

Built to keep pace with the trend toward the Industrial Internet of Things (IIoT), the M8 5-pole B-coded cordsets provide a robust solution with greater power at a smaller size, ensuring the highest performance in the field.

Applications

The M8 5-pole B-coded cordsets facilitate transmission of power and signals reliably via a compact interface to small electronic drives and sensors, making them an ideal solution for miniature robotics applications.

Specifying and design engineers, contractors and installers, and system integrators operating in machine building, material handling and industrial automation settings, will benefit from the product's outstanding handling characteristics, extended power range and easy installation that comes with the industry-proven M8 technology.

Your Benefits

Equipped with snap connections, these cordsets offer a quick attachment option that fulfills the highest demands in installation speed and convenience. Connecting sensors and compact actuators with these cordsets can be achieved in a matter of seconds. Even the newest generation of I/O link sensors Class A and B can be connected.

The ease of installation delivered by the new cordsets is especially helpful for connecting interfaces in situations where multiple end devices need to be connected in space-restricted areas. Increased current and voltage ratings, as well as flexible and adjustable cable lengths, differentiate the portfolio of these cordsets from any product available on the market.

* pending

A new product to serve your needs.
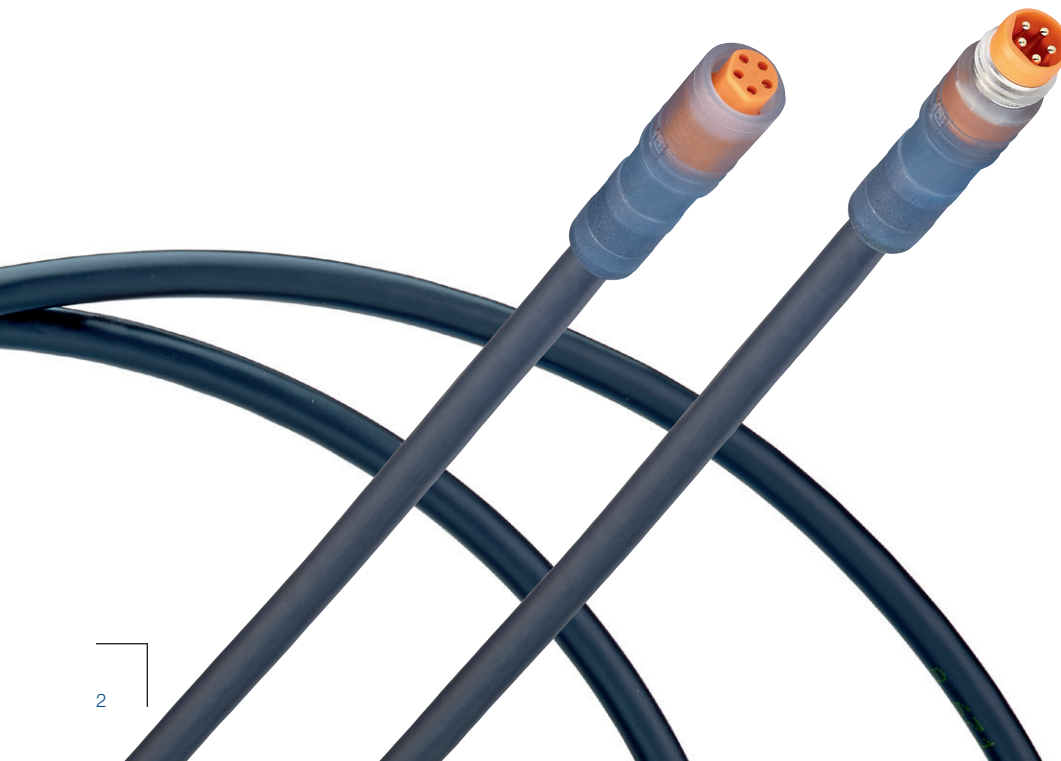## Be certain.

M8 5-pole B-coded Cordsets

The M8 5-pole B-coded cordsets are available in both male and female versions and deliver the highest application flexibility on the market, especially when combined with the industry's most popular M12 technology and Lumberg Automation's new LioN-Power system. Designed to meet the increasing requirements of IIoT, this system will revolutionize industrial connectivity in the field as the most innovative one-stop solution.

Meeting industry demand for miniature connectivity solutions, this system also features the increasingly popular I/O Link functionality and reduces the weight and size needed for installation. Further, it will enable a reduction of stock and maintenance costs due to multiprotocol I/O modules with standardized M12 Power connection.

Benefits at a Glance

- Extended power range with a peak of 4 A of current and 63 V on two pins
- Equipped with 5-poles, B-coded
- Snap and snap/thread connections for quick attachment options and exceptional handling characteristics
- Outstanding price/performance ratio
- One-stop solution with new, highly flexible LioN-Power system
- Certification according to UL 2238* standard
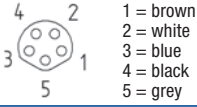- Ensuring a polarized connection that exceeds even the highest industry standards of IEC 61076-2-104
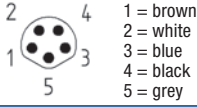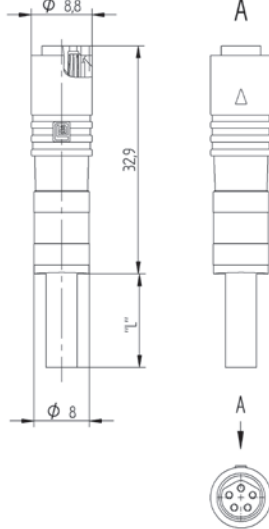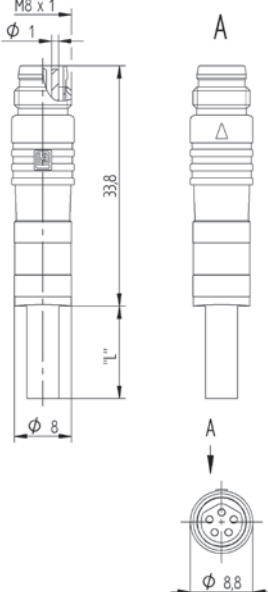
Correct polarized
connection at any time.

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* pending

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Technical Information

Product Description		
Type	**RKM 5**	**RSM 5**
Description	M8 5-pole B-coded female cordsets with snap connection	M8 5-pole B-coded male cordsets with snap connection
RoHS (2011/65/EU)	–	
(Construction Type) Standard	IEC 61076-2-104	
Approvals	UL*	
Technical Data		
Ambient Temperature	-40 °C to +90 °C, notice derating	
Housing Material/Grip	TPU	
Contact Holder Material	PA	
Contact Material/Surface Finish	CuZn, nickel underlay and gold-plated	
Screw Coupling Material	CuZn, nickel-plated	
Mechanical Data		
Degree of Protection	IP65	
Electrical Data		
Contact Resistance	≤ 5 mΩ	
Rated Voltage	63 V	
Rated Current	3 A (0.25 mm²)/4 A (0.34 mm²)	
Pollution Degree	3 acc. to IEC 60664-1 (VDE 0110-1)	
Technical Drawing		
Pin Assignment	M8, female, 5-poles 1 = brown 2 = white 3 = blue 4 = black 5 = grey	M8, male, 5-poles 1 = brown 2 = white 3 = blue 4 = black 5 = grey
Technical Drawing		

* pending

Belden Connectivity Center

Nowadays it is more important than ever to continuously increase the efficiency of production processes. Safe, cost-effective connectivity solutions for your machinery and plant play an important role in achieving this. Customized solutions tailored to your individual requirements enable you to substantially reduce your total cost of ownership. Thanks to the Belden Connectivity Center, the only one of its kind in the market, we are your worldwide partner when it comes to implementing such solutions, flexibly and rapidly, whether you need customized connectors and cable assemblies, or active and passive I/O modules for fieldbus or Ethernet networks – always in line with our motto "listen, understand, implement and deliver." You will benefit both from the expertise of our knowledgeable specialists and from our extensive experience as a leading supplier of high-quality automation components. Let us utilize your challenges for our mutual success.

About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia.

For more information, visit us at **www.beldensolutions.com** and follow us on Twitter **@BeldenInc.**