

# LioN-Safety I/O Modules

Reliable, Compact I/O Modules for Safety Applications



## PRODUCT BULLETIN

New LioN-Safety I/O modules from Lumberg Automation streamline the transmission of critical safety and non-safety-related information over proven networks for functional safety in highly automated operations.

- **Fast Parametrization:** Protect workers and machines by easily integrating the modules into your PLC's engineering tool with PROFIsafe and CIPSafety via standardized device description files.
- **Maximum Flexibility:** Connect safety inputs/outputs, non-safety I/Os and IO-Link signals and communicate not only with a PLC but also with the cloud – for added versatility and functionality.
- **High Performance and Safe Operations:** Use these PROFINET/PROFIsafe I/O modules in applications with conformance class C and Netload class III.

## Key Features

- TÜV Rheinland-certified; supports PROFIsafe protocol and up to SIL 3, Cat 4 and Performance Level e (PLe)
- Supports four IIoT protocols: OPC UA, MQTT, REST API and CoAP
- Operating temperature range of -40°C to +70°C and able to perform up to 3,000M above sea level
- Weld field immune zinc die-cast housing (IP67/IP69K)
- M12 L-coded power supply (up to 16 amps)
- Tool calling interface (TCI)-supported for simple integration into PLC engineering tools, leveraging the BELDEN PROFIsafe and CIP Safety Configurator

## Functional Safety

Functional safety refers to the overall safety of a system, which depends on the proper functioning of the safety-related system and other risk-mounting measures. It is the ability of an electrical or electronic system to achieve or remain in a well-defined safe state in the event of systematic failures or accidental hardware failures with hazardous effects

# LioN-Safety – Reliable. SAFE. Compact.

Safety becomes more and more important in complex industrial applications to protect people from malfunctions of processes or systems.

Introducing LioN-Safety – Belden’s first Safety modules and the first safety modules on the market with built-in IIoT protocols so that a connection to IIOT networks is possible.

LioN-Safety modules feature HIMA safety – the highest safety standard – inside, combining the best advice for safety concepts and functional safety and ensuring the highest quality standards.

## IO-Link



## Key Features

TÜV Rheinland certified

PROFIsafe version and CIP Safety versions available

Two hardware variants are available. A pure safety digital input module with up to 16 FS DI as well as a mixed module with up to 8 FS DI, 4 FS DO and 2 IO-Link Class A Master Ports are available.

Safety integrity level: up to SIL 3

Compact housing made of compact Weld field immune zinc die-cast housing (IP67/IP69K) and designed for harsh environments.

Up to 3000 m above sea level

## Protocol Overview



## PROFIsafe

PROFIsafe extends the standard PROFINET communication protocol to address unique requirements for functional safety-related information necessary to conform to strict safety standards. It is an additional software layer that provides functional safety over industrial ethernet in PROFINET networks.

### Advantages

- PROFIsafe adds functional safety to an existing automation network, running on the same cables.
- Compared to wired circuits, PROFIsafe requires less engineering, less cable and easier maintenance.



## CIP Safety

The “CIP Safety” protocol was specified for safety data transmission via EtherNet/IP. CIP Safety stands for “Common Industrial Protocol Safety” and is a protocol that was specifically developed for safety critical data transmission in highly automated industrial applications.

### Advantages

- CIP Safety provides fail-safe communication between devices, such as safety I/O blocks, safety light curtains and safety PLCs in functional safety applications up to Safety Integrity Level 3 (SIL3).
- CIP Safety enables to transmit safety-relevant messages on the same medium in addition to standard communication.



## LioN-Safety Benefits, Applications and Markets

### Benefits

As automation expands, the ability to protect workers becomes more complicated and urgent. The LioN-Safety I/O modules are uniquely designed for the real-time transmission of safety and non-safety-related data needed to ensure functional safety in highly automated environments. Designed in partnership with safety expert HIMA, the devices integrate safety sensor and actuator signals quickly and easily into safe PLC environments, streamlining the transmission of critical safety and diagnostic information over existing networks.

### Applications

LioN-Safety I/O modules are ideal for highly automated operations where high functional safety standards are essential to protecting people, equipment and the environment. Designed for complex industrial operations, the devices make it possible to connect the safety inputs and outputs needed to lower the risk of a hazard caused by machine or process failure. It is possible to connect versatile devices like e.g. Safety switches, RFID safety sensors, photoelectric barriers, signal towers, emergency stop pushbuttons, safety actuators, IO-Link Devices, Standard I/O signals and much more.

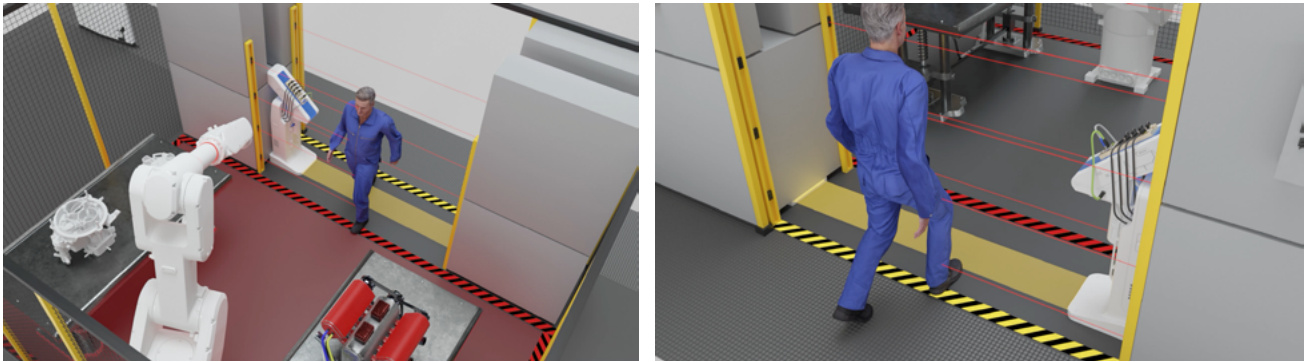
### Markets

With its space-saving design and rugged metal housing, the LioN-Safety I/O modules are suitable for use in any harsh industrial setting, including automotive, consumer packaged goods, metals, machine building and logistics.

### IIOT Protocols

A central challenge of Industry 4.0 and the industrial Internet of Things (IIoT) is the secure, standardized exchange of data and information between devices, machines and services, even from different industries. Communication via IIoT protocols serves as a basis for condition monitoring and predictive maintenance applications.

## Use Case



### **Robotics – Safeguarding Hazardous Areas:**

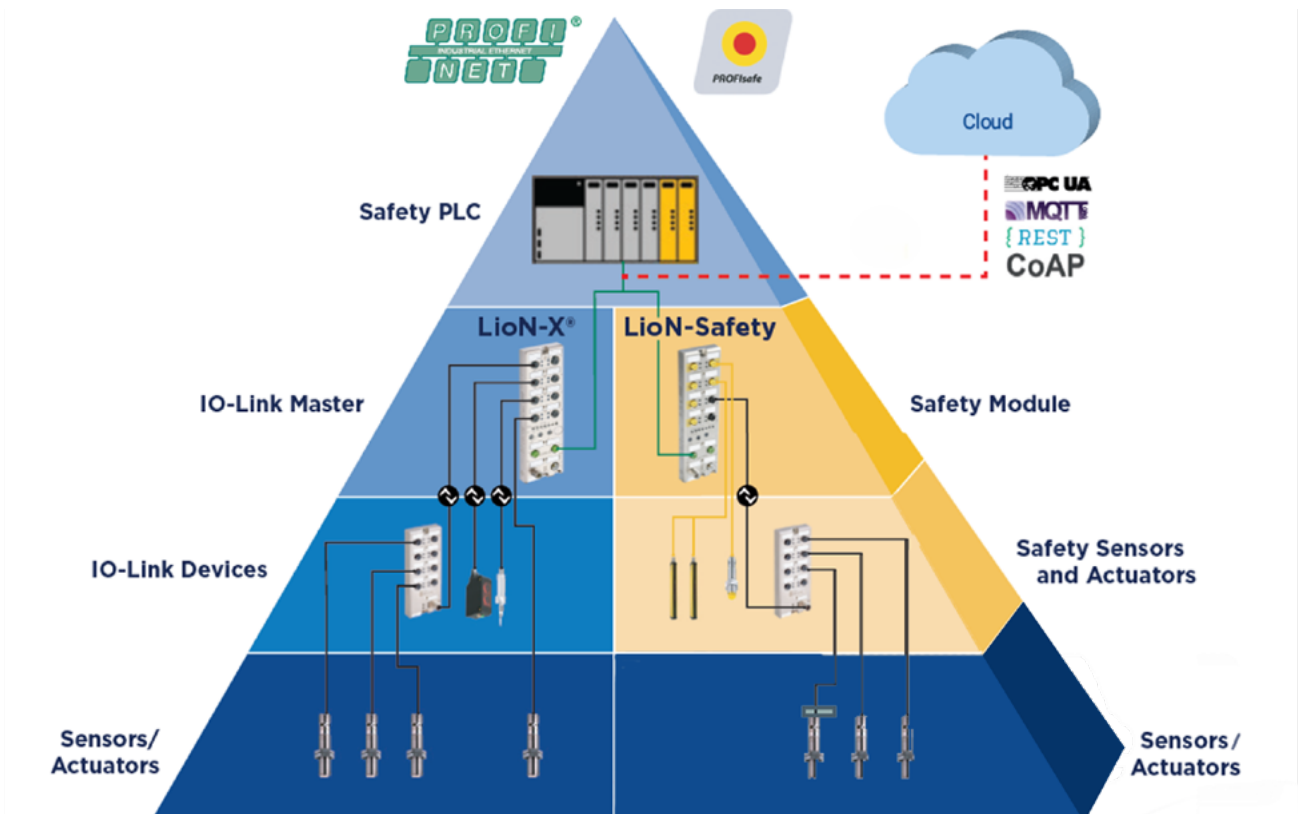
Many different sensors are used to monitor hazardous areas in the environment of machines. If a person is detected, the machinery must be slowed and stopped to prevent collision and protect the person from injury. The LioN-Safety Modules collect the signals from the sensors, such as safety light curtains or safety fail-safe inductive sensors and forward them safely to the PLC to protect workers.

### **Logistics – Automating Wrapping Installations:**

To protect pallets from damage during transport and shipping, they are wrapped with stretch foil. The access points of the wrapping installation must be secured so that no one is in danger during the wrapping process. The entire installation is secured with grids and only the inlets and outlets of the conveyor belt are open. The openings are secured by safety light curtains and safety sensors that can detect whether a pallet or a person is coming. As soon as the sensors detect a human on the conveyor, the wrapper is stopped immediately.

# PLC Integration and Cloud Computing with LioN-Safety



## A Reliable, safe and compact module for safety applications







## Why LioN-Safety?

- Two hardware variants are available:
  - » A pure safety digital input module with up to 16 FS DI
  - » A mixed module with up to 8 FS DI, 4 FS DO and 2 IO-Link Class A Master Ports
- M12 L-coded Power Supply (up to 16 A)
- IIoT protocols - LioN-Safety can be used in Industrial Internet of Things networks and this connection can be established via IIoT protocols
  - Web server available
  - Easy configuration with Belden CIP Safety Configurator and Belden PROFIsafe Configurator
  - Expanded temperature range of -40°C to +70°C
  - Compact and robust metal housing which is made for harsh environments (IP67/IP69K)

# Technical Information










		 <b>8/4 Functional Safety DI, 4 Functional Safety DO, 2 IO-Link Master Ports</b>	 <b>16/8 Functional Safety DI</b>
<b>Connection</b>	IO Ports	M12, 5 pin, A-coded	M12, 5 pin, A-coded
	Ethernet Connectors	M12, 4 pin, D-coded, 10/100 Mbit/s	M12, 4 pin, D-coded, 10/100 Mbit/s
	Power Connectors	M12 L-coded, 24 V DC	M12 L-coded, 24 V DC
<b>Safety Ports</b>		8/4 F-DI, 4-F-DO PP, PM	16/8-F-DI PP, PM
<b>IO-Link Ports</b>		2 x Class A	
<b>Fieldbus</b>		PROFINET and PROFISAFE or EtherNet/IP and CIP Safety	PROFINET and PROFISAFE or EtherNet/IP and CIP Safety
<b>Safety Integrity Level</b>		up to SIL 3	up to SIL 3
<b>IP Rating</b>		IP67/IP69K	IP67/IP69K
<b>PL (Performance Level)</b>		Up to PLe	Up to PLe
<b>Quick Connect</b>		Yes	Yes
<b>OSSD</b>		Yes	Yes
<b>Webserver</b>		Yes	Yes
<b>TÜV</b>		TÜV Rheinland	TÜV Rheinland
<b>Operating Temperature</b>		-40°C to +70°C	-40°C to +70°C
<b>Air Pressure</b>		up to 3000 m above sea level	up to 3000 m above sea level
<b>Dimensions (W x H x D)</b>		60 x 31 x 200 mm	60 x 31 x 200 mm
<b>Category Cat.</b>		ISO 134849: Up to 4	ISO 134849: Up to 4

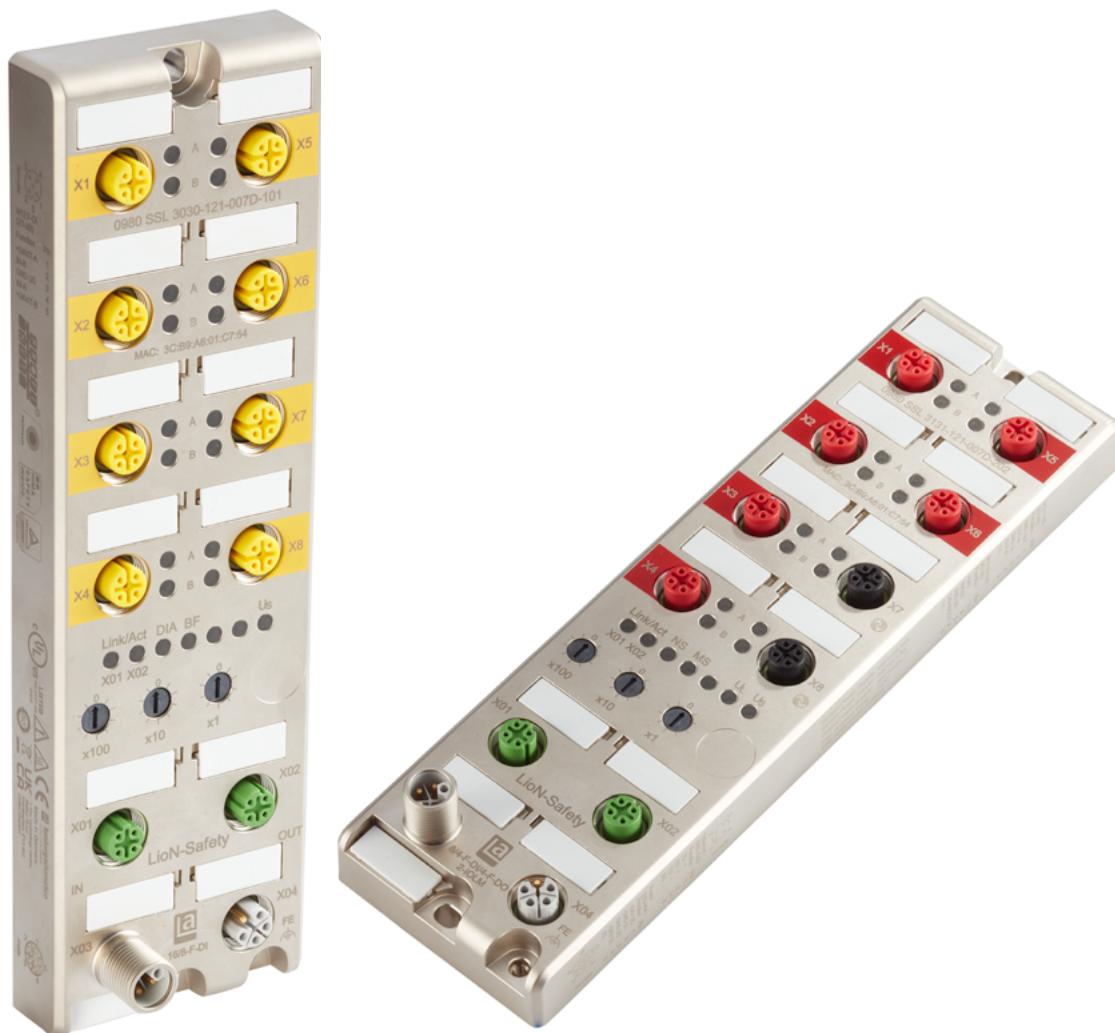
## Order Overview

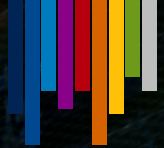
Number		Item Number	LioN-Safety Type	Real Type	Version
1		<b>935 023 006</b>	16/8-F-DI M12-PROFINET/ PROFIsafe	0980 SSL 3030-121-007D-101	PROFIsafe
2		<b>935 023 002</b>	8/4-F-DI 4-F-DO 2-IOLM M12- PROFINET/PROFIsafe	0980 SSL 3031-121-007D-101	PROFIsafe
3		<b>935 023 005</b>	16/8-F-DI M12-EIP/CIPSafety	0980 SSL 3130-121-007D-202	CIP Safety
4		<b>935 023 001</b>	8/4-F-DI 4-F-DO 2-IOLM M12- EIP/CIPSafety	0980 SSL 3131-121-007D-202	CIP Safety



# Accessories

Number		Item Number	Type	Function
1		935 712 001	0960 IOL 3816-001	IO-Link Hub
2		12121	0985 S4742 104 0985 806 103/*M	Ethernet Cable
3		934 638 618	0985 806 103	Ethernet Cable
4		12020	RST 5-RKT 5-228	Sensor/Actuator Cable
5		1008	RST 5-RKT 5-1008	Sensor/Actuator Cable
6		1006	RST 4-RKMV 4-1006	Sensor/Actuator Cable
7		30088	RST 4-RKT 4-07 RST 5-RKT 5-228/5 M	Sensor/Actuator Cable
8		934 849 076	RST 5L-RKT 5L-949	Power Supply Cable
9		934 853 581	RST 5L-RKT 5L-1002	Power connector





## 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.

## Learn More

Visit [belden.com](https://www.belden.com) for additional information and to contact our Safety solution experts.