Active I/O Modules and Stand-Alone Designs (LioN-S-, LioN-M-, LioN-R-, LioN-Classic Series)

We offer you the best solution for every requirement

General Information

In order to ensure high availability of machines and systems, I/O modules installed in harsh industrial environments must be able to meet the highest electro-mechanical demands. Thanks to their housing material and innovative encapsulation techniques, the LioN Series of distribution boxes and I/O modules offer full protection for the electronics.

LioN-S and -M

LioN-S: Because of their compact construction, the LioN-S modules with M8 connections are ideally suited for systems where space is limited. In addition, the modules in this series can be secured to the front, side or directly on the machines profile rails.

LioN-M: The convenient and vibration-proof I/O modules with M12 connection technology support PROFINET, Ethernet/IP, PROFIBUS and DeviceNet™. The different configurations can be realized with the assistance of a universal module, both for LioN-S and for LioN-M I/O modules. Each individual channel can be used either as an input or an output. This offers excellent flexibility for planning or for making changes during commissioning and subsequent upgrades.

- Simple planning and cost-effective storage of spare parts with universal I/O functionality.
- Small connection with various installation possibilities.
- Low empty weight – ideally suitable for assembly and handling applications.
- Fast commissioning, through simple and comprehensive diagnostics.

LioN-R

The new ruggedized I/O modules in the LioN series (LioN-R) have a robust design and a high level of functionality. They provide a secure connection of actuators and sensors to the control cabinet, even under extreme environmental conditions.

- The fully enclosed metal housing guarantees optimal mechanical stability and maximum protection against the most adverse environmental conditions.
- Galvanic isolation between sensors and actuators and the Ethernet/field bus protocol, together with short-circuit proof outputs and the “easy diagnostics” concept, ensures maximum availability of machines and systems.

LioN-Classic

The LioN-Classic modules are available in a sturdy molded plastic housing, for example, with M23 connection technology for hybrid cables (power supply and bus lines in a single cable).

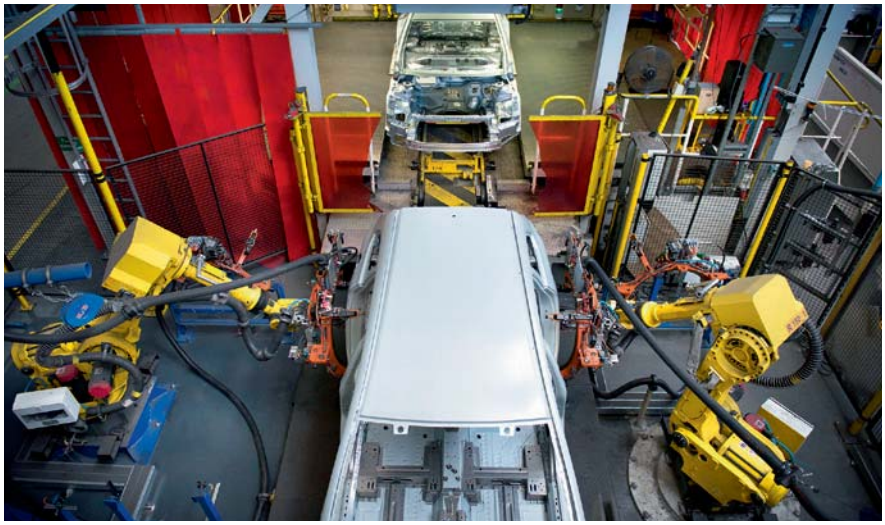
- Excellent reliability even under harsh environmental conditions – proven for decades.
- Wide choice of options for the different field bus protocols.

Customer Benefits

- Cost savings/profit increases
- Simple and fast installation and maintenance: the time required is minimized since the signals are bundled and transmitted via the field bus/Ethernet
- Flexibility: all standard field bus systems are supported
- Reliability: fail-safe modules with long service life (long-term stability)
- Rapid sourcing of spare parts, thanks to a large global sales network

Product Features

- Environmental temperature depending on type from -25°C to +60°C
- Materials (depending on type of module)
  - Housing: die-cast zinc, V4A, PBT or PUR
  - Inserts: PA
  - Contacts: CuZn, pre-nickeled and gold plated
- Mechanical data
  - Protection class IP67/IP68/IP69K
- Electrical data
  - Nominal current at +40°C: 0.5 A to 2 A per channel and up to 12 A per module
  - Nominal voltage: 18 to 30 V DC



Matrix Module Variants I/O Modules Stand-Alone Designs

Function	IP67* Stand-Alone Housing				
	Plastic			Metal	Stainless Steel
	LioN-S	LioN-M	LioN-Classic	LioN-R	LioN-Steel
Industrial Ethernet Protocols					
PROFINET					
16 Digital IN	–	✓	–	✓	–
16 Digital OUT (1.6 A)	–	–	–	✓	–
8 Digital IN/8 Digital OUT (1.6 A)	–	–	–	✓	–
16 Digital IN/OUT (1.6 A)	–	✓	–	–	–
EtherNet/IP					
16 Digital IN	–	✓	–	✓	–
16 Digital OUT (1.6 A)	–	–	–	✓	–
8 Digital IN/8 Digital OUT (1.6 A)	–	–	–	✓	–
16 Digital IN/OUT (1.6 A)	–	✓	–	–	–
Fieldbus Protocols					
PROFIBUS					
8 Digital IN	✓	–	✓	–	–
16 Digital IN	–	✓	✓	✓	–
8 Digital OUT (2 A)	–	–	✓	–	–
16 Digital OUT (0.5/1.6 A)	–	–	✓	✓	–
8 Digital IN/4 Digital OUT (2 A)	–	–	✓	–	–
8 Digital IN/8 Digital OUT (0.5 A)	–	–	✓	–	–
8 Digital IN/8 Digital OUT (1.6 A)	–	–	–	✓	–
16 Digital IN/OUT (1.6 A)	–	✓	–	–	–
8 Digital IN/OUT (2 A)	✓	–	–	–	–
DeviceNet™					
8 Digital IN	✓	–	–	–	–
16 Digital IN	–	✓	✓	–	–
8 Digital OUT (2 A)	–	–	✓	–	–
16 Digital OUT (0.7 A)	–	–	✓	–	–
8 Digital IN/8 Digital OUT (0.7 A)	–	–	✓	–	–
16 Digital IN/OUT (1.6 A)	–	✓	–	–	–
8 Digital IN/OUT (0.5 A)	✓	–	–	–	–

* Also IP68 or IP69K, depending on the design

Function	IP67* Stand-Alone Housing				
	Plastic			Metal	Stainless Steel
	LioN-S	LioN-M	LioN-Classic	LioN-R	LioN-Steel
Fieldbus Protocols					
CANopen®					
8 Digital IN	✓	–	–	–	–
16 Digital IN	–	–	✓	–	–
8 Digital OUT (2 A)	–	–	✓	–	–
16 Digital OUT (0.7 A)	–	–	✓	–	–
8 Digital IN/8 Digital OUT (0.7 A)	✓	–	✓	–	–
Interbus®					
8 Digital IN	–	–	✓	–	–
16 Digital IN	–	–	✓	–	–
8 Digital OUT (2 A)	–	–	✓	–	–
8 Digital IN/4 Digital OUT (2 A)	–	–	✓	–	–
AS-Interface					
4 Digital IN	–	–	✓	–	✓
8 Digital IN	–	–	✓	–	–
4 Digital OUT (2 A)	–	–	✓	–	–
2 Digital IN/2 Digital OUT (2 A)	–	–	✓	–	–
4 Digital IN/4 Digital OUT (2 A)	–	–	✓	–	✓

* Also IP68 or IP69K, depending on the design

I/O Modules Active – Stand-Alone: PROFINET

Be certain. Belden.

PROFINET – Process Field Network

PROFINET (Process Field Network) is an open Industrial Ethernet Standard for automation from Profibus & Profinet International (PI). PROFINET uses the Ethernet standard, is a realtime-capable system and is standardized under IEC 61158 and IEC 61784. PROFINET minimizes the costs of installation, engineering and commissioning for manufacturers of machines and systems. Operators can extend their systems with ease and at the same time benefit from a high level of system availability.

The PROFIsafe safety technology familiar from PROFIBUS is also available for PROFINET. PROFIBUS systems and other field buses such as Interbus® and DeviceNet™ can be implemented via gateways in any mixed installations comprising field bus and PROFINET-based subsystems.

PROFINET also allows use of web technologies by means of the Ethernet-based protocol – access to a web server integrated in the field devices. This allows addressing, diagnostic and other information to be retrieved easily across network boundaries using standard web browsers.

General Technical Data

Universal functionality for cost-effective and reliable solutions

Transmission medium

- 4 or 8-wire (2 or 4-pair) shielded cable as per ISO/IEC 11801 Edition 2.0, IEC 61156-1, IEC 61156-5 (Minimum Category 5)
- Optical fiber
- Hybrid cable for transmitting data and energy

Network topology

- Line structure or structured cabling using switches

Number of devices

- Arbitrary, depends on network structure

Reliable transmission rates and segment lengths

- Max. 100 Mbit/s (Fast Ethernet)

Configuration of devices

Configuration of the individual devices is performed on the basis of GSDML files (device master file in XML format), provided by the manufacturer for every slave. The GSDML files for Lumberg Automation™ bus modules can be downloaded at www.lumberg-automation.com/downloads.

Addressing

Addressing is performed based on a symbolic device name assigned by the DCP protocol.

Matrix PROFINET

Function	Slots Bus Type		Slots I/O Type		Slots Power Type		
	M12	M23	M8	M12	M12	M23	7/8″
PROFINET							
LioN-R							
16 Digital IN	✓	–	–	✓	–	–	✓
16 Digital OUT (1.6 A)	✓	–	–	✓	–	–	✓
8 Digital IN/8 Digital OUT (1.6 A)	✓	–	–	✓	–	–	✓
LioN-M							
8 Digtal IN	✓	–	–	✓	–	–	✓
16 Digital IN	✓	–	–	✓	–	–	✓
16 Digital IN/OUT (1.6 A)	✓	–	–	✓	–	–	✓
Accessories PROFINET							
Cord sets, single-ended	✓	–	–	✓	–	–	✓
Cord sets, double-ended	✓	–	–	✓	–	–	✓
Field attachable connectors	✓	–	–	✓	–	–	✓
T-connectors	✓	–	–	✓	–	–	✓

PROFINET – Digital Inputs

Technical Information

Product Description		
Type	**0980 ESL 801-PNET 16DI-M12-R**	**0980 ESL 701**
		
Description	LioN-R PROFINET device with 16 digital input channels, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 5-poles	LioN-M PROFINET device with 16 digital input channels, M12 LAN connection, D-coded, 7/8" power supply, 5-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	620 g	380 g
Bus System		
ID Number	0x0304	0x0303
GSD File	GSDML-V2.3-LumbergAutomation-LionR-980ESL80x-20130411.xml	GSDML-V2.3-LumbergAutomation-LionM-0980ESL70x-20130902.xml
Transmission Rate	10/100 Mbit/s	
Address Range	0 to 255	–
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	typ. 90 mA	
Input Power Supply		
Voltage Range	19 to 30 V DC	
Sensor Current	200 mA (at T_{amp} +30°C)	
Indicator	LED green	
Inputs		
Rated Input Current	24 V DC	
Number of Digital Channels	16	
Status Indicator	LED white per channel + yellow	LED yellow per channel
Diagnostic Indicator	LED red per port	LED red per socket
Included in Delivery		
M12 Dust Covers	4 pieces	
Attachable Labels	10 pieces	

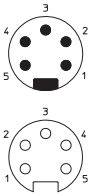
Bit Assignment

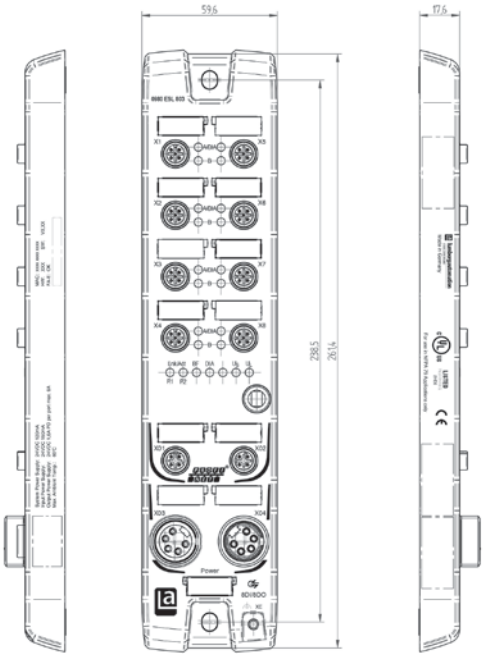
Bit	7	6	5	4	3	2	1	0
	M12 Input							
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A

Diagnostic Indication

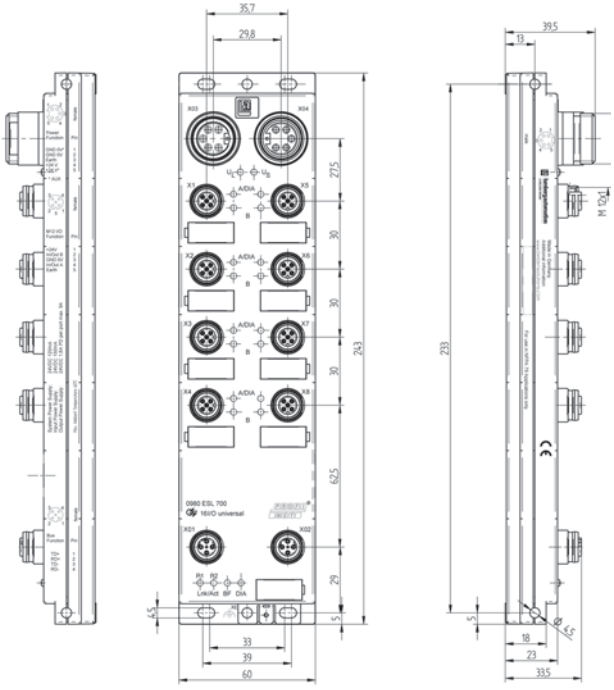
LED	Indicator	Condition
U_S	Green	Logic/sensor power supply
U_L	Green	Actuator power supply
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	White	Channel status
1...8 DIA B	Red	Periphery error
P1 Lnk/Act	Green Yellow blinking Off	Connection to a PROFINET device I/O device exchanging data No connection to another device
P2 Lnk/Act	Green Yellow blinking Off	Connection to a PROFINET device I/O device exchanging data No connection to another device
BF	Red Off	Bus error, no data exchange with I/O controller via PROFINET No error message
DIA	Red Red blinking Off	Common indicator for periphery errors Firmware update No error message

Pin Assignment

LAN Connection M12, D-coded	Power Supply 7/8″	In-/Output M12
 1 = TD+ 2 = RD+ 3 = TD- 4 = RD- Housing = shielded	 1 = GND (0 V) 2 = GND (0 V) 3 = Earth/FE 4 = +24 V 5 = +24 V	 1 = +24 V 2 = IN/OUT B 3 = GND (0 V) 4 = IN/OUT A 5 = Earth/FE Housing = FE



0980 ESL 801-PNET



0980 ESL 701

PROFINET – Digital Outputs and Digital In- and Outputs

Technical Information

Product Description		
Type	**0980 ESL 802-PNET 16DO-M12-R**	**0980 ESL 803-PNET 8DI/8DO-M12-R**
		
Description	LioN-R PROFINET device, 16 digital output channels with galvanic isolation, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 5-poles	LioN-R PROFINET device, 8 digital input and 8 output channels with galvanic isolation, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 5-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	620 g	
Bus System		
ID Number	0x0304	
GSD File	GSDML-V2.3-LumbergAutomation-LionR-980ESL80x-20130411.xml	
Transmission Rate	10/100 Mbit/s	
Address Range	0 to 255	
Inputs		
Rated Input Current	–	24 V DC
Number of Digital Channels	–	8
Status Indicator	–	LED white per channel
Diagnostic Indicator	–	LED red per port
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes/permanent inverse polarity protection	
Indicator	LED green	
Outputs		
Rated Output Current	1.6 A per channel	
Short Circuit-proof	yes	
Max. Current Carrying Capacity	9 A per module	
Number of Digital Channels	16	8
Status Indicator	LED white per channel + yellow	
Diagnostic Indicator	LED red per port	
Included in Delivery		
M12 Dust Covers	4 pieces	
Attachable Labels	10 pieces	

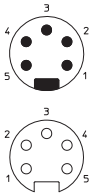
Bit Assignment

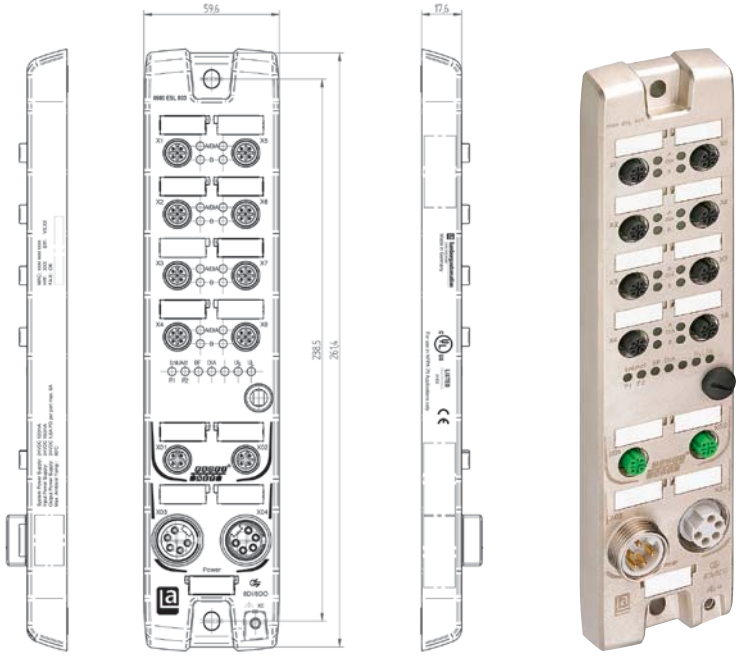
Bit	7	6	5	4	3	2	1	0
M12 Output 16DO								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A
M12 Input 8DI								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
M12 Output 8DO								
Byte 0	8B	8A	7B	7A	6B	6A	5B	5A

Diagnostic Indication

LED	Indicator	Condition
U_S	Green	Logic/sensor power supply
U_L	Green	Actuator power supply
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	White	Channel status
1...8 DIA B	Red	Periphery error
P1 Lnk/Act	Green Yellow blinking Off	Connection to a PROFINET device I/O device exchanging data No connection to another device
P2 Lnk/Act	Green Yellow blinking Off	Connection to a PROFINET device I/O device exchanging data No connection to another device
BF	Red Off	Bus error, no data exchange with I/O controller via PROFINET No error message
DIA	Red Red blinking Off	Common indicator for periphery errors Firmware update No error message

Pin Assignment

LAN Connection M12, D-coded	Power Supply 7/8″	In-/Output M12
 1 = TD+ 2 = RD+ 3 = TD- 4 = RD- Housing = shielded	 1 = GND (0 V) Actuators 2 = GND (0 V) Logic/Sensors 3 = Earth/FE 4 = +24 V Logic/Sensors 5 = +24 V Actuators	 1 = +24 V 2 = IN/OUT B 3 = GND (0 V) 4 = IN/OUT A 5 = Earth/FE Housing = FE



0980 ESL 802/803-PNET

PROFINET – Universal

Technical Information

Product Description	
Type	0980 ESL 700
	
Description	LioN-M PROFINET device with 16 digital I/O channels, channels can be used universally as inputs or outputs, M12 LAN connection, D-coded, 7/8" power supply, 5-poles
Technical Data	
Protection Class	IP67
Environmental Temperature	-10°C to +60°C
Weight	380 g
Bus System	
ID Number	0x0303
GSD File	GSDML-V2.3-LumbergAutomation-LionM-0980ESL70x-20130902.xml
Transmission Rate	10/100 Mbit/s
System/Sensors Power Supply	
Rated Voltage	24 V DC
Voltage Range	19 to 30 V DC
Power Consumption	typ. 90 mA
Input Power Supply	
Voltage Range	19 to 30 V DC
Sensor Current	200 mA (at T_{amp} +30°C)
Indicator	LED green
Inputs	
Rated Input Current	24 V DC
Number of Digital Channels	max. 16
Status Indicator	LED yellow per channel
Diagnostic Indicator	LED red per socket
Output Power Supply	
Rated Voltage	24 V DC
Voltage Range	19 to 30 V DC
Reverse Polarity Protection	yes/antiparallel diode
Indicator	LED green
Outputs	
Rated Output Current	1.6 A per channel
Short Circuit-proof	yes
Max. Current Carrying Capacity	9 A (12 A) per module
Number of Digital Channels	max. 16
Status Indicator	LED yellow per channel
Diagnostic Indicator	LED red per socket
Included in Delivery	
M12 Dust Covers	4 pieces
Attachable Labels	10 pieces

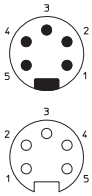
Bit Assignment

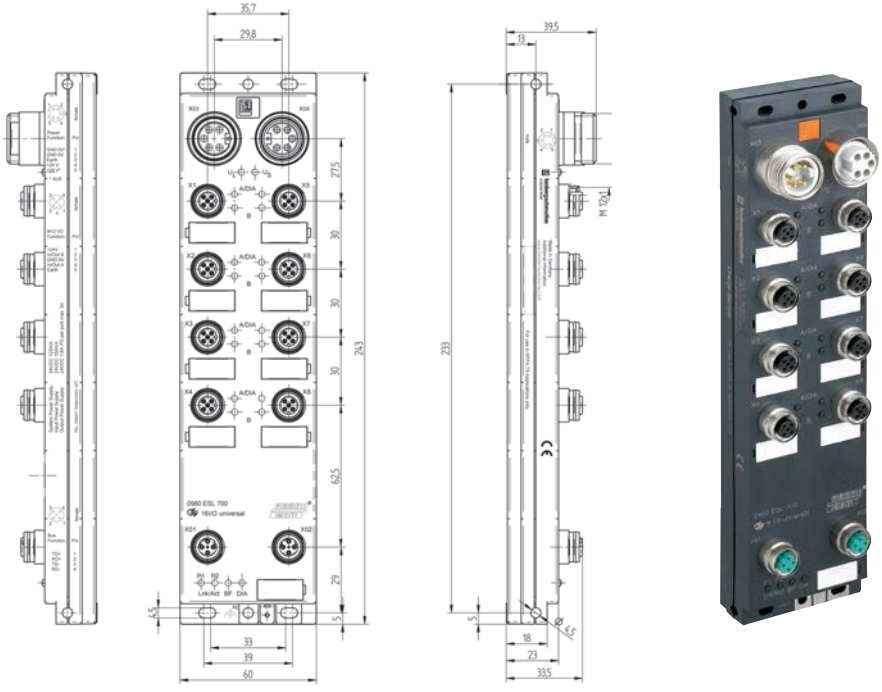
Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A
M12 Output								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A

Diagnostic Indication

LED	Indicator	Condition
U_S	Green	Logic/sensor power supply
U_L	Green	Actuator power supply
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	Yellow	Channel status
1...8 DIA B	Red	Periphery error
P1 Lnk/Act	Green Yellow blinking Off	Connection to a PROFINET device I/O device exchanging data No connection to another device
P2 Lnk/Act	Green Yellow blinking Off	Connection to a PROFINET device I/O device exchanging data No connection to another device
BF	Red Off	Bus error, no data exchange with I/O controller via PROFINET No error message
DIA	Red Red blinking Off	Common indicator for periphery errors Firmware update No error message

Pin Assignment

LAN Connection M12, D-coded	Power Supply 7/8″	In-/Output M12
 1 = TD+ 2 = RD+ 3 = TD- 4 = RD- Housing = shielded	 1 = GND (0 V) Actuators 2 = GND (0 V) Logic/Sensors 3 = Earth/FE 4 = +24 V Logic/Sensors 5 = +24 V Actuators	 1 = +24 V 2 = IN/OUT B 3 = GND (0 V) 4 = IN/OUT A 5 = Earth/FE Housing = FE



0980 ESL 700

I/O Modules Active – Stand-Alone: EtherNet/IP

Be certain. Belden.

EtherNet Industrial Protocol

A procedure was developed in 1998 by a ControlNet International working group for adapting the application protocol, the Common Industrial Protocol, to Ethernet. EtherNet/IP was published as an official industrial standard based on this procedure in March 2000.

EtherNet/IP (EtherNet Industrial Protocol, or EIP for short) is a real-time protocol used primarily in automation technology, and is promoted by more than 150 manufacturers. Based on the TCP and UDP standards, EtherNet/IP supports continuity between the office and production network. The web server integrated in the Logix control interface module can be used during startup (diagnostics) of EtherNet/IP networks as well as web servers available in other EtherNet/IP equipment.

The typical cycle time of an EtherNet/IP network is 10 ms, which means it is not suitable for "hard" realtime applications (< 1 ms), for example, for controlling servo motors. A protocol extension is available for EtherNet/IP for this purpose in the form of CIPSync or MotionSync. Normal twisted pair cables or fiber optic cables are used as a transmission medium.

General Technical Data

Optimized installation and use for increased efficiency

Transmission medium

- 4 or 8-wire (2 or 4-pair) shielded cable as per ISO/IEC 11801 Edition 2.0, ANSI/TIA/EIA-568-B.2 Annex N, Category 5 (minimum)
- Optical fiber
- Hybrid cable for transmitting data and energy

Network topology

- Line structure or structured cabling using switches
- Implemented DLR (Device Level Ring Protocol) allows uninterruptible operation

Number of devices

- Arbitrary, depends on network structure

Reliable transmission rates and segment lengths

- Max. 100 Mbit/s (Fast Ethernet)

Configuration of devices

Configuration of the individual devices is performed on the basis of EDS files (Electronic Data Sheet), provided by the manufacturer for each slave. The EDS files for Lumberg Automation™ bus modules can be downloaded at www.lumberg-automation.com/downloads.

Addressing

Addressing is performed on the basis of three rotary switches, which are used to set the last octet of the IP address. Addressing can alternatively be performed by means of a BOOTP server or DHCP server.

Matrix EtherNet/IP

Function	Slots Bus Type		Slots I/O Type		Slots Power Type		
	M12	M23	M8	M12	M12	M23	7/8″
EtherNet/IP							
LioN-R							
16 Digital IN	✓	–	–	✓	–	–	✓
16 Digital OUT (1.6 A)	✓	–	–	✓	–	–	✓
8 Digital IN/8 Digital OUT (1.6 A)	✓	–	–	✓	–	–	✓
LioN-M							
16 Digital IN	✓	–	–	✓	–	–	✓
16 Digital IN/OUT (1.6 A)	✓	–	–	✓	–	–	✓
Accessories EtherNet/IP							
Cord sets, single-ended	✓	–	–	✓	–	–	✓
Cord sets, double-ended	✓	–	–	✓	–	–	✓
Field attachable connectors	✓	–	–	✓	–	–	✓
T-connectors	✓	–	–	✓	–	–	✓

EtherNet/IP – Digital Inputs

Technical Information

Product Description		
Type	**0980 ESL 811-EIP 16DI-M12-R**	**0980 ESL 711**
		
Description	LioN-R EtherNet/IP device with 16 digital input channels, rotary switches for addressing, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 4-poles	LioN-M EtherNet/IP device with 16 digital input channels, rotary switches for addressing, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 4-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	620 g	380 g
Bus System		
ID Number	0x07	–
EDS File	EDS-V3.9-LumbergAutomation-0980ESL811-20130320.eds	Lion-M_EDS_0980ESL711_Rev_V1_2.eds
Transmission Rate	10/100 Mbit/s	
Address Range	0 to 255	–
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	typ. 90 mA	
Input Power Supply		
Voltage Range	19 to 30 V DC	
Sensor Current	200 mA	200 mA (at T_{amp} +30°C)
Indicator	LED green	
Inputs		
Rated Input Current	24 V DC	
Number of Digital Channels	16	max. 16
Status Indicator	LED white per channel + yellow	LED yellow per channel
Diagnostic Indicator	LED red per port	LED red per socket
Included in Delivery		
M12 Dust Covers	4 pieces	
Attachable Labels	10 pieces	

Bit Assignment

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A

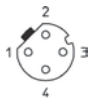
Diagnostic Indication 0980 ESL 711

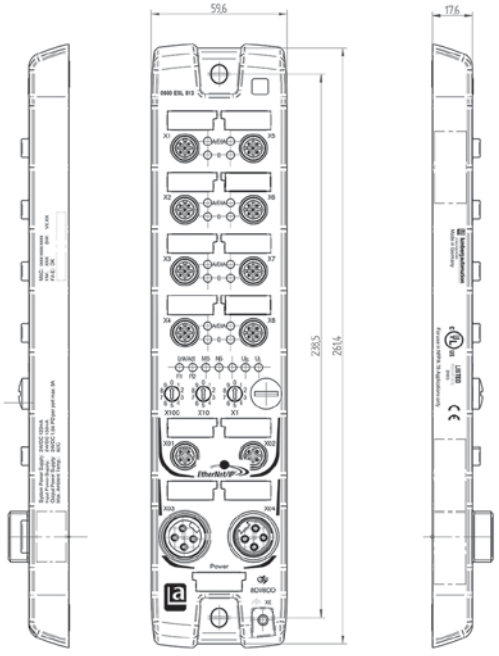
LED	Indicator	Condition
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	Yellow	Channel status
1...8 DIA B	Red	Periphery error
P1 Lnk/Act	Green Yellow blinking	Connection to an Ethernet device I/O device exchanging data
P2 Lnk/Act	Green Yellow blinking	Connection to an Ethernet device I/O device exchanging data
MS (Module status)	Green Green blinking Red/green blinking Red blinking Off	Device is ready for operating Wrong configuration Self test is running Firmware update Device is off
NS (Network status)	Green Green blinking Red Red blinking Off	Connection to master is available IP address exists, but no connection to the master IP address is already being used by another device At least one connection has timed out Device is off
U_S	Green Off	Sensor power supply applied Sensor power supply missing
U_L	Green Off	Actuator power supply applied Actuator power supply missing

Diagnostic Indication 0980 ESL 811-EIP

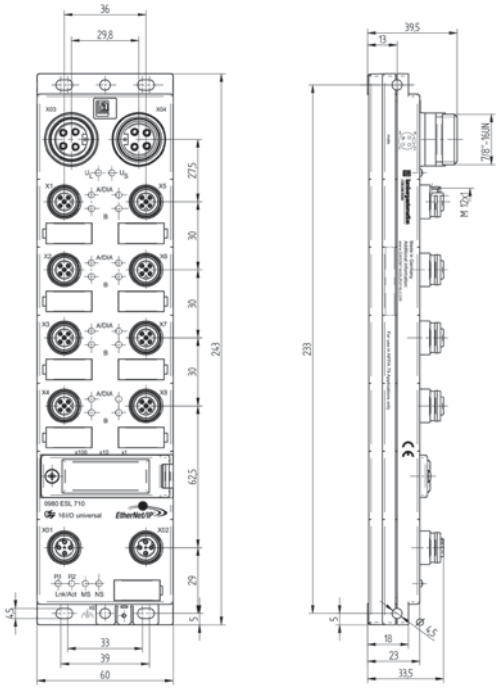
LED	Indicator	Condition
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	White	Channel status
1...8 DIA B	Red	Periphery error
P1 Lnk/Act	Green Yellow blinking Off	Connection to an Ethernet device I/O device exchanging data No connection to another device
P2 Lnk/Act	Green Yellow blinking Off	Connection to an Ethernet device I/O device exchanging data No connection to any other device
MS (Module status)	Green Green blinking Red/green blinking Red blinking Off	Device is ready for operating Wrong configuration Self test is running Firmware update IP address is available
NS (Network status)	Green blinking Green Red blinking Red Red/green blinking Off	IP address is available Connection to master is available At least one connection has timed out IP address is already being used by another device Self test is running Device is switched off/device has no IP address
U_S	Green Red	Voltage 19 V<= US<=30 V Voltage US<19 V or US>30 V
U_L	Green Red	Voltage 19 V<= UL<=30 V Voltage UL<19 V or UL>30 V

Pin Assignment

LAN Connection M12, D-coded	Power Supply 7/8"	In-/Output M12
 1 = TD+ 2 = RD+ 3 = TD- 4 = RD- Housing = shielded	 1 = +24 V Actuators 2 = +24 V Logic/Sensors 3 = GND (0 V) Logic/Sensors 4 = GND (0 V) Actuators Housing = FE	 1 = +24 V 2 = IN/OUT B 3 = GND (0 V) 4 = IN/OUT A 5 = Earth/FE Housing = FE



0980 ESL 811-EIP



0980 ESL 711

EtherNet/IP – Digital Outputs and Digital In- and Outputs

Technical Information

Product Description		
Type	**0980 ESL 812-EIP 16DO-M12-R**	**0980 ESL 813-EIP 8DI/8DO-M12-R**
		
Description	LioN-R EtherNet/IP device, 16 digital output channels with galvanic isolation, rotary switches for addressing, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 4-poles	LioN-R EtherNet/IP device, 8 digital input and 8 output channels with galvanic isolation, rotary switches for addressing, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 4-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	620 g	
Bus System		
ID Number	0x07	
EDS File	EDS-V3.9-LumbergAutomation-0980ESL812-20130320.eds	EDS-V3.0-LumbergAutomation-0980ESL813-20130320.eds
Transmission Rate	10/100 Mbit/s	
Address Range	0 to 255	
Inputs		
Rated Input Current	–	24 V DC
Number of Digital Channels	–	8
Status Indicator	–	LED white per channel + yellow
Diagnostic Indicator	–	LED red per port
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes/antiparallel diode	
Indicator	LED white	
Outputs		
Rated Output Current	1.6 A per channel	
Short Circuit-proof	yes	
Max. Current Carrying Capacity	9 A per module	
Number of Digital Channels	16	8
Status Indicator	LED white per channel + yellow	
Diagnostic Indicator	LED red per port	
Included in Delivery		
M12 Dust Covers	4 pieces	
Attachable Labels	10 pieces	

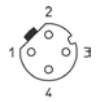
Bit Assignment

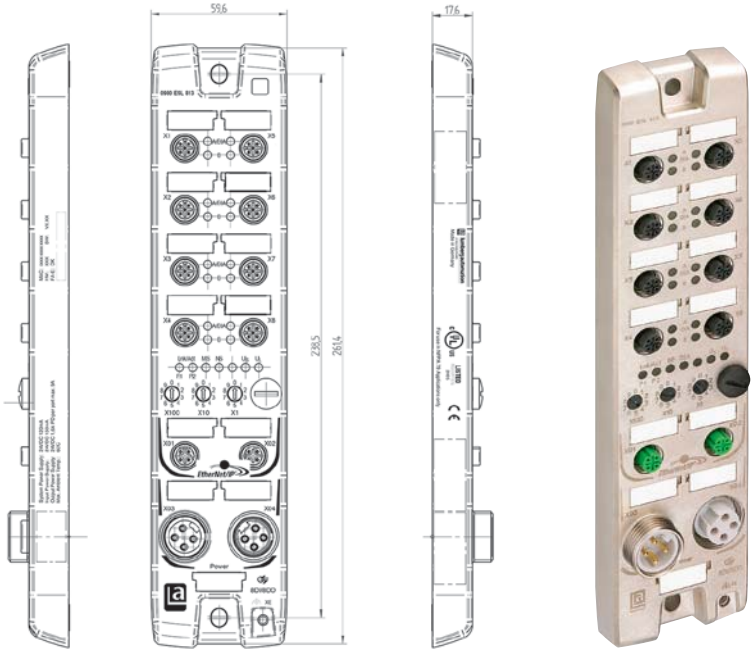
Bit	7	6	5	4	3	2	1	0
M12 Output 16DO								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A
M12 Input 8DI								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
M12 Output 8DO								
Byte 0	8B	8A	7B	7A	6B	6A	5B	5A

Diagnostic Indication

LED	Indicator	Condition
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	White	Channel status
1...8 DIA B	Red	Periphery error
P1 Lnk/Act	Green Yellow blinking Off	Connection to an Ethernet device I/O device exchanging data No connection to another device
P2 Lnk/Act	Green Yellow blinking Off	Connection to an Ethernet device I/O device exchanging data No connection to another device
MS (Module status)	Green Green blinking Red/green blinking Red blinking Off	Device is ready for operating Wrong configuration Self test is running Firmware update IP address is available
NS (Network status)	Green blinking Green Red blinking Red Red/green blinking Off	IP address is available Connection to master is available At least one connection has timed out IP address is already being used by another device Self test is running Device is switched off/device has no IP address
U_S	Green Red	Voltage 19 V<= US<=30 V Voltage US<19 V oder US>30 V
U_L	Green Red	Voltage 19 V<= UL<=30 V Voltage UL<19 V or UL>30 V

Pin Assignment

LAN Connection M12, D-coded	Power Supply 7/8"	In-/Output M12
 1 = TD+ 2 = RD+ 3 = TD- 4 = RD- Housing = shielded	 1 = +24 V Actuators 2 = +24 V Logic/Sensors 3 = GND (0 V) Logic/Sensors 4 = GND (0 V) Actuators Housing = FE	 1 = +24 V 2 = IN/OUT B 3 = GND (0 V) 4 = IN/OUT A 5 = Earth Housing = FE



0980 ESL 812/813-EIP

EtherNet/IP – Universal

Technical Information

Product Description	
Type	0980 ESL 710
	
Description	LioN-M EtherNet/IP device with 16 digital I/O channels, channels can be used universally as inputs or outputs, rotary switches for addressing, M12 LAN connection, 4-poles, D-coded, 7/8" power supply, 4-poles
Technical Data	
Protection Class	IP67
Environmental Temperature	-10°C to +60°C
Weight	380 g
Bus System	
EDS File	Lion-M_EDS_0980ESL710_Rev_V1_2.eds
Transmission Rate	10/100 Mbit/s
System/Sensors Power Supply	
Rated Voltage	24 V DC
Voltage Range	19 to 30 V DC
Power Consumption	typ. 90 mA
Input Power Supply	
Voltage Range	19 to 30 V DC
Sensor Current	200 mA (at T_{amp} +30°C)
Indicator	LED green
Inputs	
Rated Input Current	24 V DC
Number of Digital Channels	max. 16
Status Indicator	LED yellow per channel
Diagnostic Indicator	LED red per socket
Output Power Supply	
Rated Voltage	24 V DC
Voltage Range	19 to 30 V DC
Reverse Polarity Protection	yes/antiparallel diode
Indicator	LED green
Outputs	
Rated Output Current	1.6 A per channel
Short Circuit-proof	yes
Max. Current Carrying Capacity	9 A (12 A) per module
Number of Digital Channels	max. 16
Status Indicator	LED yellow per channel
Diagnostic Indicator	LED red per socket
Included in Delivery	
M12 Dust Covers	4 pieces
Attachable Labels	10 pieces

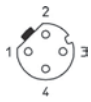
Bit Assignment

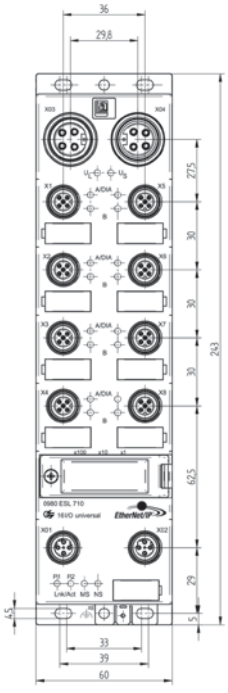
Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A
M12 Output								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A

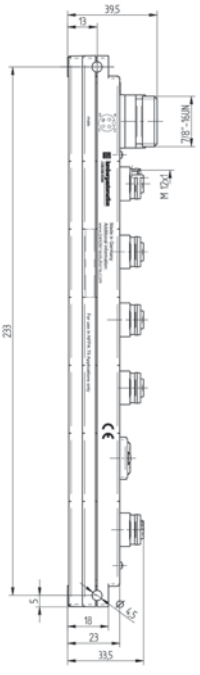
Diagnostic Indication

LED	Indicator	Condition
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	Yellow	Channel status
1...8 DIA B	Red	Periphery error
P1 Lnk/Act	Green Yellow blinking	Connection to an Ethernet device I/O device exchanging data
P2 Lnk/Act	Green Yellow blinking	Connection to an Ethernet device I/O device exchanging data
MS (Module status)	Green Green blinking Red/green blinking Red blinking Off	Device is ready for operating Wrong configuration Self test is running Firmware update Device is off
NS (Network status)	Green Green blinking Red Red blinking Off	Connection to master is available IP address exists, but no connection to the master IP address is used by a different device Connection has timed out Device is off
U_S	Green Off	Sensor power supply applied Sensor power supply missing
U_L	Green Off	Actuator power supply applied Actuator power supply missing

Pin Assignment

LAN Connection M12, D-coded	Power Supply 7/8"	In-/Output M12
 1 = TD+ 2 = RD+ 3 = TD- 4 = RD- Housing = shielded	 1 = +24 V Actuators 2 = +24 V Logic/Sensors 3 = GND (0 V) Logic/Sensors 4 = GND (0 V) Actuators Housing = FE	 1 = +24 V 2 = IN/OUT B 3 = GND (0 V) 4 = IN/OUT A 5 = Earth Housing = FE





0980 ESL 710

I/O Modules Active – Stand-Alone: PROFIBUS

Be certain. Belden.

PROFIBUS – Process Field Bus

PROFIBUS (Process Field Bus) is an open fieldbus standard in compliance with the international standard EN 50170. To meet various demands in automation technology PROFIBUS is subdivided into three different profiles:

- PROFIBUS-FMS (Field Message Specification):
  Protocol for communication between different control systems (PLCs or PCs)
- PROFIBUS-PA (Process Automation):
  Intrinsically safe bus system for process technology
- PROFIBUS-DP (Decentral Periphery):
  Transmission protocol for the communication between control system and decentral input/output assemblies

The I/O Modules from Lumberg Automation™ Support the PROFIBUS-DP Protocol

Thanks to support from most leading control unit manufacturers, and to vendor-independent enhanced development by PNO (Profibus User Organization), PROFIBUS will also play an important role in field bus systems in the future.

Reliable PROFIBUS solutions for industrial automation technology worldwide

General Technical Data

Transmission medium

- 2-wire, shielded cable (according to RS485)
- Fiber optic cable
- Hybrid cable for the transmission of data and supply voltage

Network topology

Line structure with active bus termination (resistance network) at both ends of a segment.

Number of devices

- 32 per segment
- Repeaters can be used to expand the bus to up 126 participants

Reliable transmission rates and segment lengths

This depends on the transmission rate (Baud rate) the segment lengths and the number of repeaters which can be switched serially.

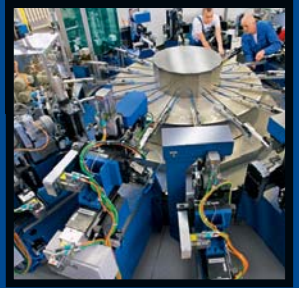
Bit/s	9.6 k	19.2 k	45.45 k	93.75 k	187.5 k	500.0 k	1.5 M	3, 6, 12 M
Length (m)	1.200	1.200	1.200	1.200	1.000	400	200	100
Max. number of repeaters	7	7	7	7	7	7	4	4

Configuration of devices

The individual participants are projectioned by means of the GSD files (configuration file) which are provided by the manufacturer for each slave. The GSD files for the Lumberg Automation™ bus modules can be downloaded from www.lumberg-automation.com/downloads.

Addressing

An individual address is allocated to each participant via rotary address switches (address 1...99) or addressing tools (address 1...126).



Matrix PROFIBUS

Function	Slots Bus Type		Slots I/O Type		Slots Power Type		
	M12	M23	M8	M12	M12	M23	7/8″
PROFIBUS							
LioN-R							
16 Digital IN	✓	–	–	✓	–	–	✓
16 Digital OUT (1.6 A)	✓	–	–	✓	–	–	✓
8 Digital IN/8 Digital OUT (1.6 A)	✓	–	–	✓	–	–	✓
LioN-M							
16 Digital IN	✓	–	–	✓	–	–	✓
16 Digital IN/OUT (1.6 A)	✓	–	–	✓	–	–	✓
LioN-S							
8 Digital IN	✓	–	✓	–	✓	–	–
8 Digital IN/OUT (0.5 A)	✓	–	✓	–	✓	–	–
LioN-Classic							
8 Digital IN	✓	–	–	✓	–	✓	–
16 Digital IN	✓	–	–	✓	–	✓	–
8 Digital OUT (2 A)	✓	–	–	✓	–	✓	–
16 Digital OUT (0.5 A)	✓	–	–	✓	–	✓	–
8 Digital IN/4 Digital OUT (2 A)	✓	–	–	✓	–	✓	–
8 Digital IN/8 Digital OUT (0.5 A)	✓	–	–	✓	–	✓	–
Accessories PROFIBUS							
Cord sets, single-ended	✓	–	✓	✓	✓	✓	✓
Cord sets, double-ended	✓	–	✓	✓	✓	✓	✓
Field attachable connectors	✓	–	✓	✓	✓	✓	✓
T-connectors	✓	–	✓	✓	✓	✓	✓

PROFIBUS – Digital Inputs

Technical Information

Product Description		
Type	**0970 PSL 111**	**0970 PSL 114**
		
Description	LioN-Classic PROFIBUS-DP device with 16 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, M23 power supply, 6-poles	LioN-Classic PROFIBUS-DP device with encapsulated housing, with 8 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, M23 power supply, 6-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	535 g	
Bus System		
ID Number	044E hex	044F hex
GSD File	Lum_044E.gsd	Lum_044F.gsd
Transmission Rate	max. 12 MB	
Address Range	1 to 125	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	90 mA	60 mA
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	100 mA (at T_{amp} +30°C)	max. 800 mA
Indicator	LED green per channel	
Inputs		
Rated Input Current	24 V DC	
Number of Digital Channels	16	8
Status Indicator	LED green per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0970 PSL 111

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	8A	7A	6A	5A	4A	3A	2A	1A
Byte 1	8B	7B	6B	5B	4B	3B	2B	1B
Diagnostic								
DIA-Byte	–	–	–	OVL	–	–	–	–

OVL: Overload status

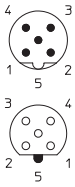
Bit Assignment 0970 PSL 114

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	8	7	6	5	4	3	2	1
Diagnostic								
DIA-Byte	–	–	–	OVL	–	–	–	–

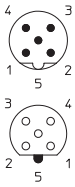
Diagnostic Indication

LED	Indicator	Condition
1...8 A/B (only 0970 PSL 111)	Yellow	Channel status
1...8 (only 0970 PSL 114)	Yellow	Channel status
Us	Green	Sensor supply active
UL	Green	Module electronic supply active
BF	Red	Bus error
DIA	Red	Module diagnostics (sensor short circuit/sensor overload)

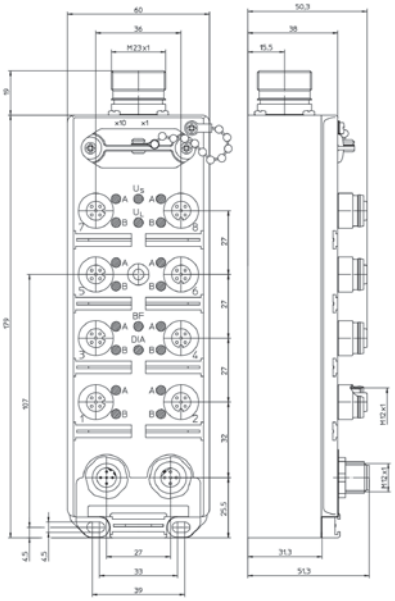
Pin Assignment 0970 PSL 111

Bus Connection M12	Power Supply M23	Input M12
		
1 = +5 V [1] 2 = Line A 3 = GND (0 V) [1] 4 = Line B 5 = Earth	1 = Earth 2 = n.c. 3 = n.c. 4 = +24 V [2] 5 = GND (0 V) [2] 6 = n.c.	1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth

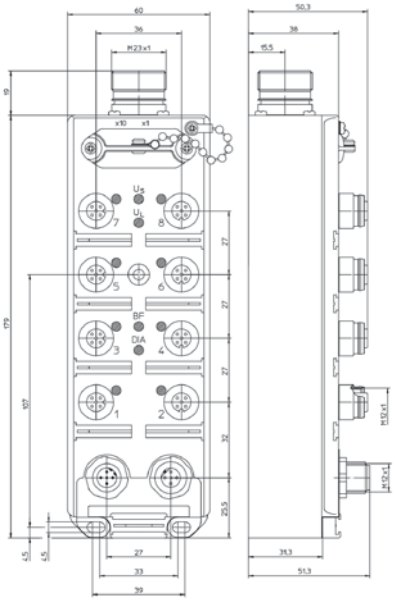
Pin Assignment 0970 PSL 114

Bus Connection M12	Power Supply M23	Input M12
		
1 = +5 V [1] 2 = Line A 3 = GND (0 V) [1] 4 = Line B 5 = Earth	1 = Earth 2 = n.c. 3 = n.c. 4 = +24 V [2] 5 = GND (0 V) [2] 6 = n.c.	1 = +24 V 2 = n.c. 3 = GND (0 V) 4 = IN 5 = Earth

1 = Internal signals
2 = System/sensors



0970 PSL 111



0970 PSL 114

PROFIBUS – Digital Inputs

Technical Information

Product Description		
Type	**0970 PSL 651**	**0970 PSL 701**
		
Description	LioN-S PROFIBUS-DP device with 8 digital inputs to connect standard sensors, M8 socket, 3-poles, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, M12 power supply, 5-poles	LioN-M PROFIBUS-DP device with 16 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, 7/8" power supply, 5-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	200 g	380 g
Bus System		
ID Number	09C9 hex	09CA hex
GSD File	Lum_09C9.gsd	Lum_09CA.gsd
Transmission Rate	max. 12 MB	
Address Range	1 to 125	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	90 mA	120 mA
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	100 mA (at T_{amp} +30°C)	
Indicator	LED green per channel	
Inputs		
Rated Input Current	24 V DC	
Number of Digital Channels	8	16
Status Indicator	LED green per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	4 pieces
Attachable Labels	10 pieces	

Bit Assignment 0970 PSL 651

Bit	7	6	5	4	3	2	1	0
	M8 Input							
Byte 0	8	7	6	5	4	3	2	1

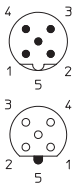
Bit Assignment 0970 PSL 701

Bit	7	6	5	4	3	2	1	0
	M12 Input							
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A

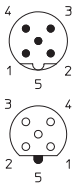
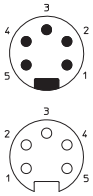
Diagnostic Indication

LED	Indicator	Condition
1...8 (only 0970 PSL 651)	Yellow Red	Channel status Periphery error
1...8 A/B (only 0970 PSL 701)	Yellow	Channel status
1...8 A/B DIA (only 0970 PSL 701)	Red	Periphery error
Us	Green	Sensor/system power supply
BF	Red	Bus error
DIA	Red	Common indication for periphery faults

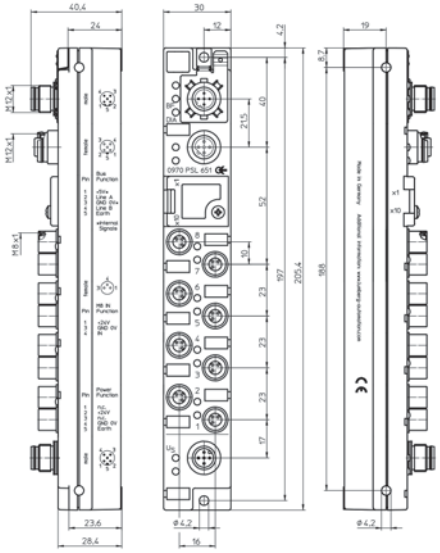
Pin Assignment 0970 PSL 651

Bus Connection M12	Power Supply M12	Input M8
 1 = +5 V [1] 2 = Line A 3 = GND (0 V) [1] 4 = Line B 5 = Earth Housing = Earth	 1 = – 2 = +24 V [2] 3 = GND (0 V) 4 = GND (0 V) 5 = Earth	 1 = +24 V [2] 3 = GND (0 V) 4 = IN

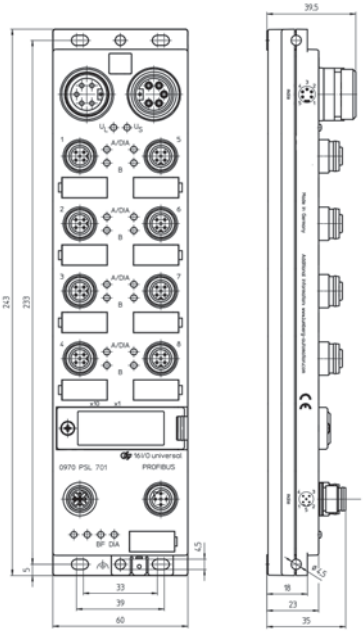
Pin Assignment 0970 PSL 701

Bus Connection M12	Power Supply 7/8″	Input M12
 1 = +5 V [1] 2 = Line A – GN 3 = GND (0 V) [1] 4 = Line B – RD 5 = Earth Housing = Earth	 1 = GND (0 V) 2 = GND (0 V) 3 = Earth 4 = +24 V 5 = –	 1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth

1 = Internal signals: galvanically separated to sensors
2 = System/sensors



0970 PSL 651



0970 PSL 701

PROFIBUS – Digital Inputs

Technical Information

Product Description	
Type	**0970 PSL 811-PB-DP 16DI-M12-R**
	
Description	LioN-R PROFIBUS-DP device with 16 digital inputs to connect standard sensors, 8 x M12 socket, A-coded, 5-poles, rotary switches for addressing, PROFIBUS connection 2 x M12, 5-poles, B-coded, power supply 2 x 7/8", 5-poles
Technical Data	
Protection Class	IP67
Environmental Temperature	-10°C to +60°C
Weight	615 g
Housing Material	Metal (die-cast zinc)
Bus System	
ID Number	0E94
GSD File	LUM_0E94.gsd
Transmission Rate	max. 12 MBaud
Address Range	1 to 125 dez (default address: 126 dez)
System/Sensors Power Supply (Us)	
Rated Voltage	24 V DC
Voltage Range	18 to 30 V DC
Power Consumption	typ. 60 mA
Input Power Supply	
Voltage Range	min. (Us – 1.5 V)
Sensor Current per Socket	200 mA (at T_{amp} +30°C)
Indicator	LED green/red
Inputs (Type 3 acc. to IEC 61131-2)	
Rated Input Current	24 V DC
Number of Digital Channels	16
Status Indicator	LED yellow channel A/LED white channel B
Diagnostic Indicator	LED red per port
Included in Delivery	
M12 Dust Covers	4 pieces
Attachable Labels	10 pieces

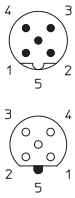
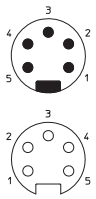
Bit Assignment

Bit	7	6	5	4	3	2	1	0
	M12 Input							
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A

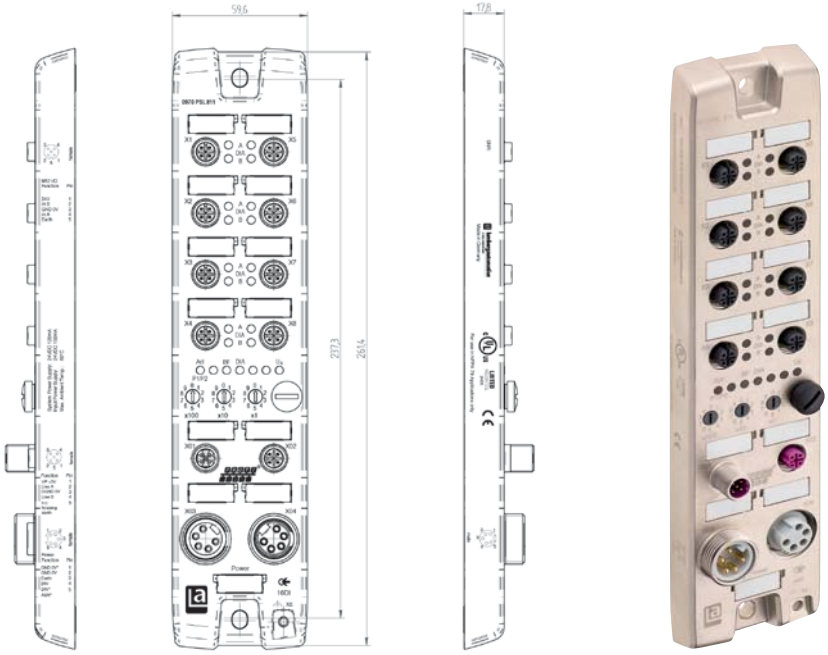
Diagnostic Indication

LED	Indicator	Condition
Us	Green	Logic/sensor power supply OK
Us	Red	Logic/sensor power supply outside limits
UL	Green	Actuator power supply OK
UL	Red	Actuator power supply outside limits
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	White	Channel status
1...8 DIA B	Red	Periphery error
ACT	Yellow	PROFIBUS communication active
BF	Red	Bus error, no data exchange with controller
BF	Green	Data exchange with controller
DIA	Green	No peripheral error message available
DIA	Red	Peripheral error message to controller

Pin Assignment

Bus Connection M12, B-coded	Power Supply 7/8"	Input M12, A-coded
 **IN** M12 male connector, 5-poles **OUT** M12 socket, 5-poles 1 = VP (+5 V)* 2 = Line A 3 = DGND (0 V)* 4 = Line B 5 = n.c. Housing = shielded	 **IN** 7/8" male connector, 5-poles **OUT** 7/8" socket, 5-poles 1 = GND Actuators UL 2 = GND System/ Sensors US 3 = Earth/FE 4 = +24 V System/ Sensors US 5 = +24 V Actuators UL	 **IN** 1 = +24 V DC 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth/FE Housing = FE

* Signals isolated galvanically from sensors/actuators



0970 PSL 811-PB-DP 16DI-M12-R

PROFIBUS – Digital Outputs

Technical Information

Product Description		
Type	**0970 PSL 112**	**0970 PSL 124**
		
Description	LioN-Classic PROFIBUS-DP device with 8 digital outputs to connect standard actuators, combined FIXCON®/M12 socket, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, M23 power supply, 6-poles	LioN-Classic PROFIBUS-DP device with 16 digital outputs to connect standard actuators, combined FIXCON®/M12 socket, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, M23 power supply, 6-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	535 g	200 g
Bus System		
ID Number	044D hex	06EA.hex
GSD File	Lum_044D.gsd	Lum_06EA.gsd
Transmission Rate	max. 12 MB	
Address Range	1 to 125	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	60 mA	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs		
Rated Output Current	2 A per channel	0.7 A per channel
Short Circuit-proof	yes	
Max. Current Carrying Capacity	15 A per module	11.2 A per module
Number of Digital Channels	8	16
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0970 PSL 112

Bit	7	6	5	4	3	2	1	0
M12 Output								
Byte 0	8	7	6	5	4	3	2	1
Diagnostic								
DIA-Byte	–	UVA	ASC	–	–	–	–	–

UVA: Undervoltage actuator
ASC: Actuator short-circuit

Bit Assignment 0970 PSL 124

Bit	7	6	5	4	3	2	1	0
M12 Output								
Byte 0	8A	7A	6A	5A	4A	3A	2A	1A
Byte 1	8B	7B	6B	5B	4B	3B	2B	1B
Diagnostic								
DIA-Byte	–	UVA	ASC	–	–	–	–	–

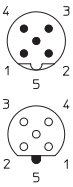
Diagnostic Indication

LED	Indicator	Condition
1...8 A (only 0970 PSL 112)	Yellow	Channel status
1...8 (only 0970 PSL 112)	Red	Actuator short circuit
1...8 A/B (only 0970 PSL 124)	Yellow Red	Channel status Actuator short circuit
U_S	Green	Actuator supply active
U_L	Green	Module electronic supply active
BF	Red	Bus error
DIA	Red	Module diagnostics (actuator low voltage/actuator short-circuit/actuator overload)

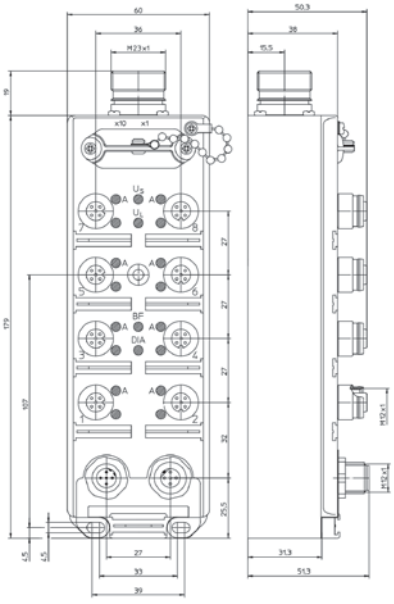
Pin Assignment 0970 PSL 112

Bus Connection M12	Power Supply M23	Output M12
		
1 = +5 V [1] 2 = Line A 3 = GND (0 V) [1] 4 = Line B 5 = Earth	1 = Earth 2 = +24 V [2] 3 = GND (0 V) [2] 4 = +24 V [3] 5 = GND (0 V) [3] 6 = n.c.	1 = n.c. 2 = n.c. 3 = GND (0 V) 4 = OUT 5 = Earth

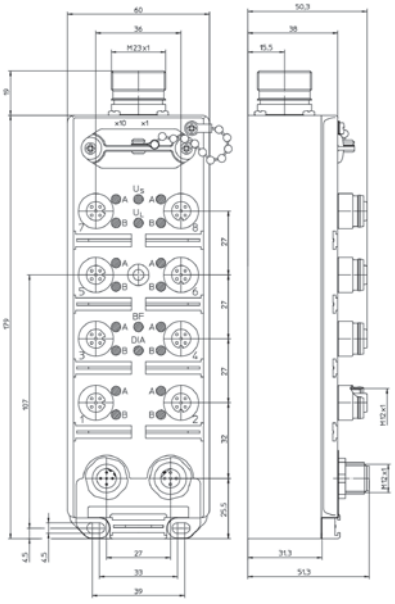
Pin Assignment 0970 PSL 124

Bus Connection M12	Power Supply M23	Output M12
		
1 = +5 V [1] 2 = Line A 3 = GND (0 V) [1] 4 = Line B 5 = Earth	1 = Earth 2 = +24 V [2] 3 = GND (0 V) [2] 4 = +24 V [3] 5 = GND (0 V) [3] 6 = n.c.	1 = n.c. 2 = OUT B 3 = GND (0 V) 4 = OUT A 5 = Earth

1 = Internal signals • 2 = Actuators • 3 = System



0970 PSL 112



0970 PSL 124

PROFIBUS – Digital Outputs

Technical Information

Product Description	
Type	0970 PSL 812-PB-DP 16DO-M12-R
	
Description	LioN-R PROFIBUS-DP device 16 digital output channels with galvanic isolation to connect standard actuators, 8 x M12 socket, A-coded, 5-poles, rotary switches for addressing, PROFIBUS connection 2 x M12, 5-poles, B-coded, power supply 2 x 7/8", 5-poles
Technical Data	
Protection Class	IP67
Environmental Temperature	-10°C to +60°C
Weight	615 g
Housing Material	Metal (die-cast zinc)
Bus System	
ID Number	0E94
GSD File	LUM_0E94.gsd
Transmission Rate	max. 12 MBaud
Address Range	1 to 125 dez (default address: 126 dez)
System-Stromversorgung	
Rated Voltage	24 V DC
Voltage Range	18 to 30 V DC
Power Consumption	typ. 60 mA
Output Power Supply	
Rated Voltage	24 V DC
Voltage Range	18 to 30 V DC
Reverse Polarity Protection	yes/permanent inverse polarity protection
Indicator	LED green
Outputs	
Rated Output Current	1.6 A per channel
Short Circuit-proof	yes
Max. Strombelastbarkeit	9 A per module
Number of Digital Channels	16
Channel Type N.O.	p-switching
Status Indicator	LED yellow channel A/LED white channel B
Diagnostic Indicator	LED red per port
Included in Delivery	
M12 Dust Covers	4 pieces
Attachable Labels	10 pieces

Bit Assignment

Bit	7	6	5	4	3	2	1	0
	M12 Output							
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A

Diagnostic Indication

LED	Indicator	Condition
Us	Green	Logic/sensor power supply OK
Us	Red	Logic/sensor power supply outside limits
UL	Green	Actuator power supply OK
UL	Red	Actuator power supply outside limits
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	White	Channel status
1...8 DIA B	Red	Periphery error
ACT	Yellow	PROFIBUS communication active
BF	Red	Bus error, no data exchange with controller
BF	Green	Data exchange with controller
DIA	Green	No peripheral error message available
DIA	Red	Peripheral error message to controller

Pin Assignment

Bus Connection M12, B-coded

IN
M12 male connector,
5-poles

OUT
M12 socket,
5-poles

1 = VP (+5 V)*
2 = Line A
3 = DGND (0 V)*
4 = Line B
5 = n.c.

Housing = shielded

Power Supply 7/8"

IN
7/8" male connector,
5-poles

OUT
7/8" socket,
5-poles

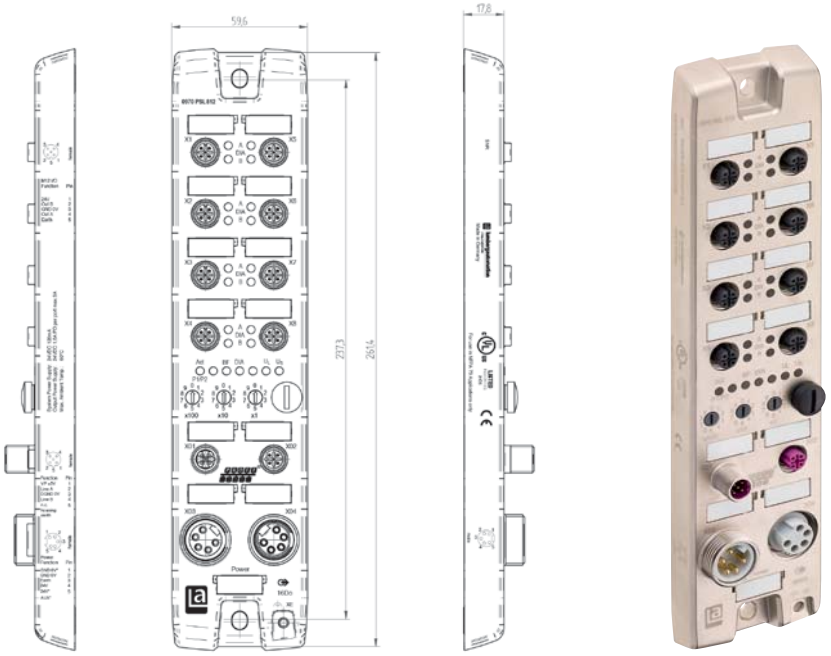
1 = GND Actuators UL
2 = GND System/
Sensors US
3 = Earth/FE
4 = +24 V System/
Sensors US
5 = +24 V Actuators UL

Output M12, A-coded

OUT
1 = n. c.
2 = OUT B
3 = GND
4 = OUT A
5 = Earth/FE

Housing = FE

* Signals isolated galvanically from sensors/actuators



0970 PSL 812-PB-DP 16DO-M12-R

PROFIBUS – Digital In- and Outputs

Technical Information

Product Description		
Type	**0970 PSL 113**	**0970 PSL 123**
		
Description	LioN-Classic PROFIBUS-DP device with 8 digital inputs to connect standard sensors and 4 digital outputs to connect standard actuators, combined FIXCON®/M12 socket, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, M23 power supply, 6-poles	LioN-Classic PROFIBUS-DP device with 8 digital inputs to connect standard sensors and 8 digital outputs (0.5 A) to connect standard actuators, combined FIXCON®/M12 socket, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, M23 power supply, 6-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	535 g	
Bus System		
ID Number	0450 hex	06E9 hex
GSD File	Lum_0450.gsd	Lum_06E9.gsd
Transmission Rate	max. 12 MBaud	
Address Range	1 to 126	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	60 mA	
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	800 mA	
Indicator	LED green	
Inputs		
Rated Input Current	24 V DC	
Number of Digital Channels	8	
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs		
Rated Output Current	2 A per channel	0.7 A per channel
Short Circuit-proof	yes	
Max. Current Carrying Capacity	8 A per module	5.6 A per module
Number of Digital Channels	4	8
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0970 PSL 113

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	4B	3B	2B	1B	4A	3A	2A	1A
M12 Output								
Byte 0	–	–	–	–	8	6	4	2
Diagnostic								
DIA-Byte	–	UVA	ASC	OVL	–	–	–	–

UVA: Undervoltage actuator • ASC: Actuator short-circuit
OVL: Overload status

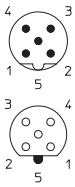
Bit Assignment 0970 PSL 123

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	8B	6B	4B	2B	8A	6A	4A	2A
M12 Output								
Byte 0	7B	5B	3B	1B	7A	5A	3A	1A
Diagnostic								
DIA-Byte	–	UVA	ASC	OVL	–	–	–	–

Diagnostic Indication

LED	Indicator	Condition
1, 3, 5, 7 A/B 2, 4, 6, 8 A (only 0970 PSL 113)	Yellow	Channel status
2, 4, 6, 8 (only 0970 PSL 113)	Red	Actuator short circuit
1...8 A/B (only 0970 PSL 123)	Yellow	Channel status
2, 4, 6, 8 A/B (only 0970 PSL 123)	Red	Actuator short circuit
U_S	Green	Actuator supply active
U_L	Green	Module electronic supply active
BF	Red	Bus error
DIA	Red	Module diagnostics (sensor shortcircuit/sensor overload/ actuator low voltage/actuator short-circuit/actuator overload)

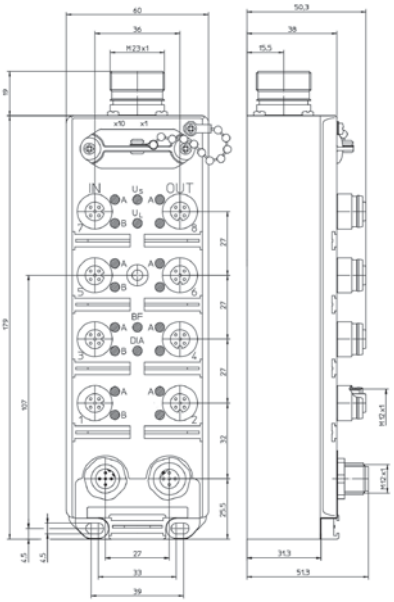
Pin Assignment 0970 PSL 113

Bus Connection M12	Power Supply M23	In-/Output M12	
			**IN** / **OUT**
1 = +5 V [1] 2 = Line A 3 = GND (0 V) [1] 4 = Line B 5 = Earth	1 = Earth 2 = +24 V [2] 3 = GND (0 V) [2] 4 = +24 V [3] 5 = GND (0 V) [3] 6 = n.c.		1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth **OUT** 1 = n.c. 2 = n.c. 3 = GND (0 V) 4 = OUT 5 = Earth

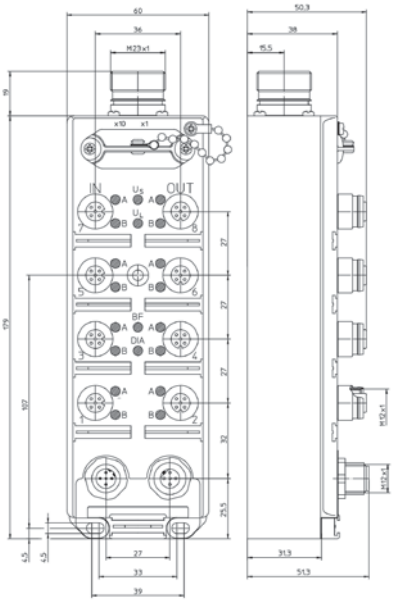
Pin Assignment 0970 PSL 123

Bus Connection M12	Power Supply M23	In-/Output M12	
			**IN** / **OUT**
1 = +5 V [1] 2 = Line A 3 = GND (0 V) [1] 4 = Line B 5 = Earth	1 = Earth 2 = +24 V [2] 3 = GND (0 V) [2] 4 = +24 V [3] 5 = GND (0 V) [3] 6 = n.c.		1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth **OUT** 1 = n.c. 2 = OUT B 3 = GND (0 V) 4 = OUT A 5 = Earth

1 = Internal signals • 2 = Actuators • 3 = System



0970 PSL 113



0970 PSL 123

PROFIBUS – Digital In- and Outputs

Technical Information

Product Description	
Type	**0970 PSL 813-PB-DP 8DI8DO-M12-R**
	
Description	LioN-R PROFIBUS-DP device with 8 digital input channels and 8 output channels with galvanic isolation, 8 x M12 socket, A-coded, 5-poles, rotary switches for addressing, PROFIBUS connection 2 x M12, 5-poles, B-coded, power supply 2 x 7/8", 5-poles
Technical Data	
Protection Class	IP67
Environmental Temperature	-10°C to +60°C
Weight	615 g
Housing Material	Metal (die-cast zinc)
Bus System	
ID Number	0E94
GSD File	LUM_0E94.gsd
Transmission Rate	max. 12 MBaud
Address Range	1 to 125 dez (default address: 126 dez)
System/Sensors Power Supply (Us)	
Rated Voltage	24 V DC
Voltage Range	18 to 30 V DC
Power Consumption	typ. 60 mA
Input Power Supply	
Voltage Range	min. (Us – 1.5 V)
Sensor Current per Socket	200 mA (at T_{amp} +30°C)
Indicator	LED green/red
Inputs (Type 3 acc. to IEC 61131-2)	
Rated Input Current	24 V DC
Number of Digital Channels	8
Status Indicator	LED white per channel
Diagnostic Indicator	LED red per port
Output Power Supply	
Rated Voltage	24 V DC
Voltage Range	18 to 30 V DC
Reverse Polarity Protection	yes/permanent inverse polarity protection
Indicator	LED green
Outputs	
Rated Output Current	1.6 A per channel
Short Circuit-proof	yes
Max. Current Carrying Capacity	9 A per module
Number of Digital Channels	8
Channel Type N.O.	p-switching
Status Indicator	LED yellow channel A/LED white channel B
Diagnostic Indicator	LED red per port
Included in Delivery	
M12 Dust Covers	4 pieces
Attachable Labels	10 pieces

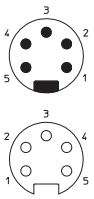
Bit Assignment

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
M12 Output								
Byte 0	8B	8A	7B	7A	6B	6A	5B	5A

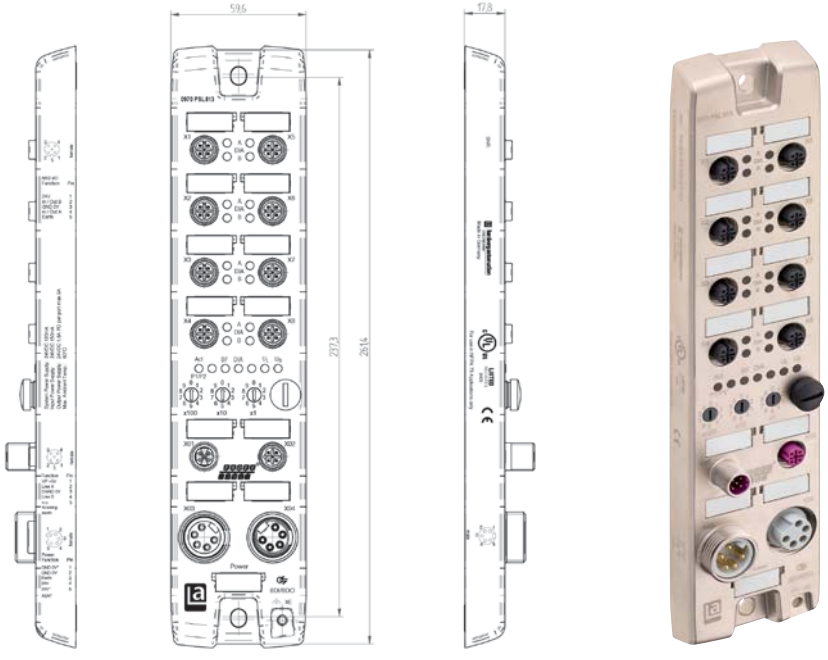
Diagnostic Indication

LED	Indicator	Condition
Us	Green	Logic/sensor power supply OK
Us	Red	Logic/sensor power supply outside limits
UL	Green	Actuator power supply OK
UL	Red	Actuator power supply outside limits
1...8 A	Yellow	Channel status
1...8 DIA A	Red	Periphery error
1...8 B	White	Channel status
1...8 DIA B	Red	Periphery error
ACT	Yellow	PROFIBUS communication active
BF	Red	Bus error, no data exchange with controller
BF	Green	Data exchange with controller
DIA	Green	No peripheral error message available
DIA	Red	Peripheral error message to controller

Pin Assignment

Bus Connection M12, B-coded	Power Supply 7/8"	In-/Output M12, A-coded
 **IN** M12 male connector, 5-poles **OUT** M12 socket, 5-poles 1 = VP (+5 V)* 2 = Line A 3 = DGND (0 V)* 4 = Line B 5 = n.c. Housing = shielded	 **IN** 7/8" male connector, 5-poles **OUT** 7/8" socket, 5-poles 1 = GND Actuators UL 2 = GND System/ Sensors US 3 = Earth/FE 4 = +24 V System/ Sensors US 5 = +24 V Actuators UL	 **IN** 1 = +24 V DC 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth/FE **OUT** 1 = n. c. 2 = OUT B 3 = GND 4 = OUT A 5 = Earth/FE Housing = FE

* Signals isolated galvanically from sensors/actuators



0970 PSL 813-PB-DP 8DI8DO-M12-R

PROFIBUS – Universal

Technical Information

Product Description		
Type	**0970 PSL 650**	**0970 PSL 700**
		
Description	LioN-S PROFIBUS-DP device with 8 digital I/O channels, channels can be used universally as inputs or outputs, M8 socket, 3-poles, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, M12 power supply, 5-poles	LioN-M PROFIBUS-DP device with 16 digital I/O channels, channels can be used universally as inputs or outputs, combined FIXCON®/M12 socket, rotary switches for addressing, M12 bus connection, 5-poles, B-coded, 7/8" power supply, 5-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	200 g	380 g
Bus System		
ID Number	09C9 hex	09CA hex
GSD File	Lum_09C9.gsd	Lum_09CA.gsd
Transmission Rate	max. 12 MB	
Address Range	1 to 125	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	60 mA	120 mA
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	90 mA	200 mA (at T_{amp} +30°C)
Indicator	LED green	
Inputs		
Rated Input Current	24 V DC	
Number of Digital Channels	max. 8	max. 16
Status Indicator	LED green per channel	
Diagnostic Indicator	LED red per channel	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs		
Rated Output Current	2 A per channel	1.6 A per channel
Short Circuit-proof	yes	
Max. Current Carrying Capacity	4 A per module	9 A per module
Number of Digital Channels	max. 8	max. 16
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	LED red per channel/socket
Included in Delivery		
M12 Dust Covers	2 pieces	4 pieces
Attachable Labels	10 pieces	

Bit Assignment 0970 PSL 650

Bit	7	6	5	4	3	2	1	0
M8 Input								
Byte 0	8	7	6	5	4	3	2	1
M8 Output								
Byte 0	8	7	6	5	4	3	2	1

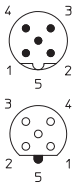
Bit Assignment 0970 PSL 700

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A
M12 Output								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A

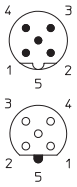
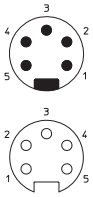
Diagnostic Indication

LED	Indicator	Condition
1...8 (only 0970 PSL 650)	Yellow Red	Channel status Periphery error
1...8 A/B (only 0970 PSL 700)	Yellow	Channel status
1...8 A/B DIA (only 0970 PSL 700)	Red	Periphery error
U_S	Green	Sensor/system power supply
U_L	Green	Actuator power supply
BF	Red	Bus error
DIA	Red	Common indication for periphery faults

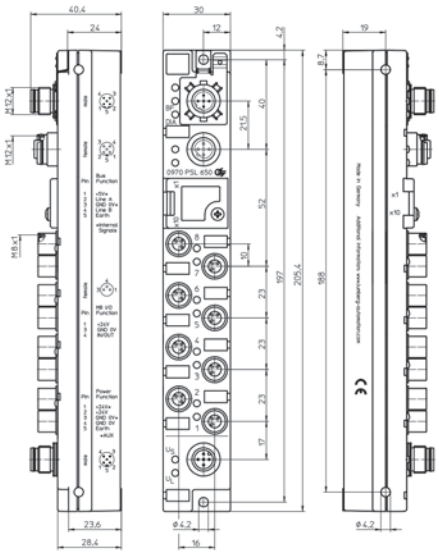
Pin Assignment 0970 PSL 650

Bus Connection M12	Power Supply M12	In-/Output M8
 1 = +5 V [1] 2 = Line A 3 = GND (0 V) [1] 4 = Line B 5 = Earth Housing = Earth	 1 = +24 V [2] 2 = +24 V [3] 3 = GND (0 V) [2] 4 = GND (0 V) [3] 5 = Earth	 1 = +24 V [3] 3 = GND (0 V) 4 = IN/OUT

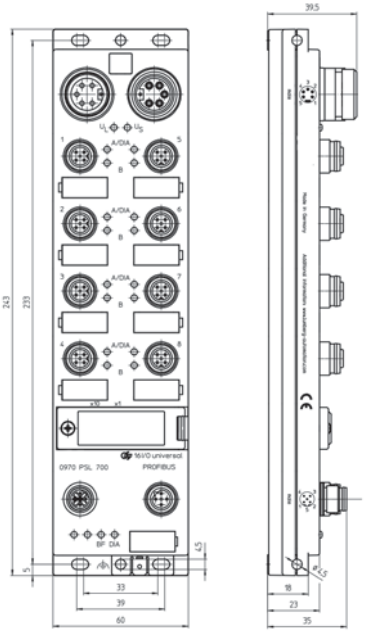
Pin Assignment 0970 PSL 700

Bus Connection M12	Power Supply 7/8"	In-/Output M12
 1 = +5 V [1] 2 = Line A – GN 3 = GND (0 V) [1] 4 = Line B – RD 5 = Earth Housing = Earth	 1 = GND (0 V) [2] 2 = GND (0 V) [3] 3 = Earth 4 = +24 V [3] 5 = +24 V [2]	 1 = +24 V 2 = IN/OUT B 3 = GND (0 V) 4 = IN/OUT A 5 = Earth

1 = Internal signals: galvanically separated to sensors/actuators • 2 = Actuators • 3 = System/sensors



0970 PSL 650



0970 PSL 700

I/O Modules Active – Stand-Alone: DeviceNet™

Be certain. Belden.

DeviceNet™ – Versatile Use in Factory Automation

DeviceNet™ is part of the CIP protocol family. CIP stands for "Common Industrial Protocol". It is the platform for several communication protocols including DeviceNet, EtherNet/IP and CompoNet, as well as protocol enhancements for safety applications (CIP Safety) and motion control (CIP Motion).

DeviceNet™ is a fieldbus system for the direct connection of sensors and actuators in the field (e.g. proximity switches, motor starters, valves, etc.). DeviceNet™ originated in North America and and is presently used worldwide in all areas of plant automation.

DeviceNet™ is based on the CAN specifications (Controller Area Network). However, unlike CAN it is restricted in functionality for easier implementation.

General Technical Data

Robust and reliable for meeting the strictest electro-mechanical requirements

Transmission medium

The individual stations are generally connected via a hybrid cable to transmit data (according to RS485) and for power supply (module electronics and sensors). It is made of 2 twisted and shielded pairs of wires contained inside another 360° shielding.

There are two standardized types of cable:

- "Thick cable" for the trunk line
- "Thin cable" with smaller cable cross sections for drop lines

Network topology

Line structure with drop lines or for drop lines only. The trunk line is terminated by resistors on both sides, the drop lines do not require a terminating resistor.

Number of devices

- 64 nodes (including master)

Admissible transmission rates and line lengths

Depending on the transmission rate (Baud rate) the admissible cable lengths (main and stub lines) change as follows:

Transmission Rate	125 kbit/s	250 kbit/s	500 kbit/s
Max. line length main line (thick cable)	500 m (1.640 ft.)	250 m (820 ft.)	100 m (328 ft.)
Max. line length drop line	6 m (20 ft.)	6 m (20 ft.)	6 m (20 ft.)
Max. line length drop lines accumulated	156 m (512 ft.)	78 m (256 ft.)	39 m (128 ft.)

Configuration of devices

The individual participants are projectioned by means of the EDS files (Electronic Data Sheet) which are provided by the manufacturer for each slave. The EDS files for the Lumberg Automation™ bus modules can be downloaded from www.lumberg-automation.com/downloads.

Addressing

Addressing is implemented via software or rotary address switches. Software addressing can be implemented via addressing tools or the master.

Matrix DeviceNet™

Function	Slots Bus Type		Slots I/O Type		Slots Power Type		
	M12	7/8″	M8	M12	M12	M23	7/8″
DeviceNet™							
LioN-M							
16 Digital IN	–	✓	–	✓	–	–	–
16 Digital IN/OUT (1.6 A)	–	✓	–	✓	–	–	✓
LioN-S							
8 Digital IN	✓	–	✓	–	–	–	–
8 Digital IN/OUT (0.5 A)	✓	–	✓	–	✓	–	–
LioN-Classic							
16 Digital IN	✓	✓	–	✓	–	–	–
8 Digital OUT (2 A)	✓	✓	–	✓	–	–	✓
16 Digital OUT (0.5 A)	✓	✓	–	✓	–	–	✓
8 Digital IN/4 Digital OUT (2 A)	–	–	–	✓	–	–	✓
8 Digital IN/8 Digital OUT (0.5 A)	✓	✓	–	✓	–	–	✓
Accessories DeviceNet™							
Cord sets, single-ended	✓	✓	✓	✓	✓	–	✓
Cord sets, double-ended	✓	✓	✓	✓	✓	–	✓
Field attachable connectors	✓	✓	✓	✓	✓	–	✓
T-connectors	✓	✓	✓	✓	✓	–	✓

DeviceNet™ – Digital Inputs

Technical Information

Product Description		
Type	**0930 DSL 651**	**0930 DSL 701**
		
Description	LioN-S DeviceNet™ device with 8 digital inputs to connect standard sensors, M8 socket, 3-poles, rotary switches for addressing, M12 bus connection, 5-poles	LioN-M DeviceNet™ device with 16 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, 7/8" bus connection, 5-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	190 g	380 g
Bus System		
Transmission Rate	max. 500 kBaud	
Address Range	0 to 63	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	11 to 30 V DC	
Power Consumption	60 mA	100 mA
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	100 mA (at T_{amp} +30°C)	200 mA (at T_{amp} +30°C)
Indicator	LED green	
Inputs (Type 3 acc. to IEC 61131-2)		
Rated Input Current	24 V DC	
Number of Digital Channels	max. 8	max. 16
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	–
Included in Delivery		
M12 Dust Covers	2 pieces	4 pieces
Attachable Labels	10 pieces	

Bit Assignment 0930 DSL 651

Bit	7	6	5	4	3	2	1	0
M8 Input								
Byte 0	8	7	6	5	4	3	2	1
Diagnostic								
Byte 1	S8	S7	S6	S5	S4	S3	S2	S1

S1 to 8: Socket status 1 to 8

Bit Assignment 0930 DSL 701

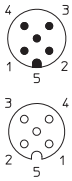
Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A
Diagnostic								
Byte 2	S8	S7	S6	S5	S4	S3	S2	S1

Diagnostic Indication

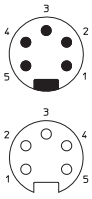
LED	Indicator	Condition
1...8 (only 0930 DSL 651)	Yellow Red	Channel status Periphery error
1...8 A/B (only 0930 DSL 701)	Yellow	Channel status
1...8 A/DIA (only 0930 DSL 701)	Red	Periphery error
U_S	Green	Sensor power supply
U_L (only 0930 DSL 651)	Green	Actuator power supply
MS (Module status)	Green Green blinking Red Red blinking Red/green blinking	Device is ready for operating Wrong configuration Unrecoverable fault Recoverable fault Self test is running
NS (Network status)	Green Green blinking Red blinking Red	Online, communication with PLC Online, no communication with PLC Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID

The diagnostic message of the fieldbus is made at the DeviceNet™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.

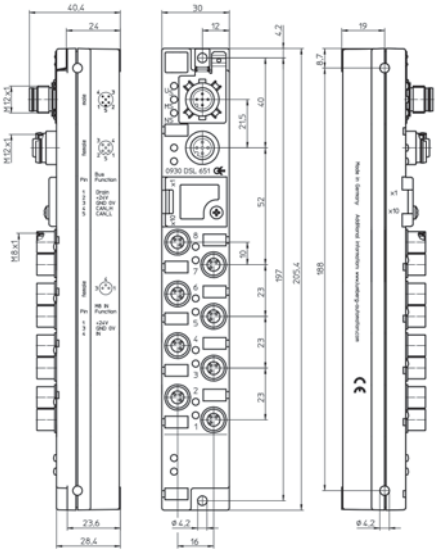
Pin Assignment 0930 DSL 651

Bus Connection M12	Input M8
 1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	 1 = +24 V 3 = GND (0 V) 4 = IN

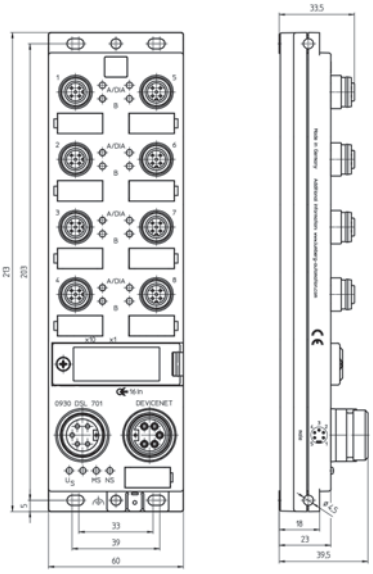
Pin Assignment 0930 DSL 701

Bus Connection 7/8″	Input M12
 1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L Housing = Earth	 1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth

1 = System/sensors



0930 DSL 651



0930 DSL 701

DeviceNet™ – Digital Inputs

Technical Information

Product Description		
Type	**0930 DSL 108**	**0930 DSL 109**
		
Description	LioN-Classic DeviceNet™ device with 16 digital inputs (p-switching) to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles	LioN-Classic DeviceNet™ device with 16 digital inputs (n-switching) to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	570 g	
Bus System		
Transmission Rate	max. 500 kBaud	
Address Range	0 to 63	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	11 to 30 V DC	
Power Consumption	max. 80 mA	
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	max. 800 mA	
Indicator	LED green	
Inputs (Type 3 acc. to IEC 61131-2)		
Rated Input Current	24 V DC	
Number of Digital Channels	16	
Status Indicator	LED yellow per channel	
Diagnostic Indicator	–	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	8A	7A	6A	5A	4A	3A	2A	1A
Byte 1	8B	7B	6B	5B	4B	3B	2B	1B
Diagnostic								
Byte 2	OVL	–	–	–	–	–	–	–

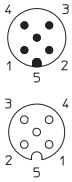
OVL: Overload status

Diagnostic Indication

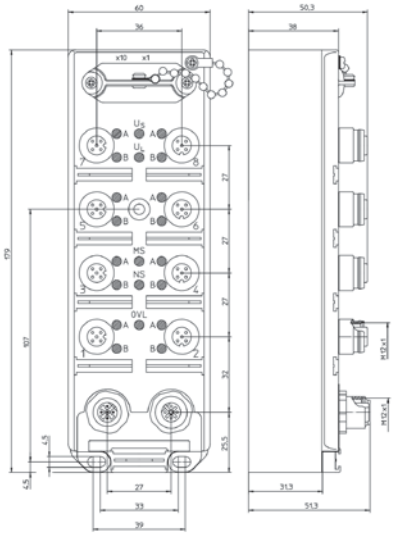
LED	Indicator	Condition
1...8 A/B	Yellow	Channel status
U_S	Green	Sensor power supply
U_L	Green	Module electronic supply
OVL	Red	Sensor short circuit/sensor overload
MS (Module status)	Green Green blinking Red Red blinking Red/green blinking	Device is ready for operating Wrong configuration Unrecoverable fault Recoverable fault Self test is running
NS (Network status)	Green Green blinking Red blinking Red	Online, communication with PLC Online, no communication with PLC Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID

The diagnostic message of the fieldbus is made at the DeviceNet™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.

Pin Assignment

Bus Connection M12	Input M12
 1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	 1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth

1 = System/sensors



0930 DSL 108 | 0930 DSL 109

DeviceNet™ – Digital Inputs

Technical Information

Product Description		
Type	**0930 DSL 312**	**0930 DSL 313**
		
Description	LioN-Classic DeviceNet™ device with 16 digital inputs (p-switching) to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, 7/8" bus connection, 5-poles	LioN-Classic DeviceNet™ device with 16 digital inputs (n-switching) to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, 7/8" bus connection, 5-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	570 g	
Bus System		
Transmission Rate	max. 500 kBaud	
Address Range	0 to 63	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	11 to 30 V DC	
Power Consumption	max. 80 mA	
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	max. 800 mA	
Indicator	LED green	
Inputs (Type 3 acc. to IEC 61131-2)		
Rated Input Current	24 V DC	
Number of Digital Channels	16	
Status Indicator	LED yellow per channel	
Diagnostic Indicator	–	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	8A	7A	6A	5A	4A	3A	2A	1A
Byte 1	8B	7B	6B	5B	4B	3B	2B	1B
Diagnostic								
Byte 2	OVL	–	–	–	–	–	–	–

OVL: Overload status

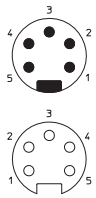
Diagnostic Indication

LED	Indicator	Condition
1...8 A/B	Yellow	Channel status
U_S	Green	Sensor power supply
U_L	Green	Module electronic supply
OVL	Red	Sensor short circuit/sensor overload
MS (Module status)	Green Green blinking Red Red blinking Red/green blinking	Device is ready for operating Wrong configuration Unrecoverable fault Recoverable fault Self test is running
NS (Network status)	Green Green blinking Red blinking Red	Online, communication with PLC Online, no communication with PLC Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID

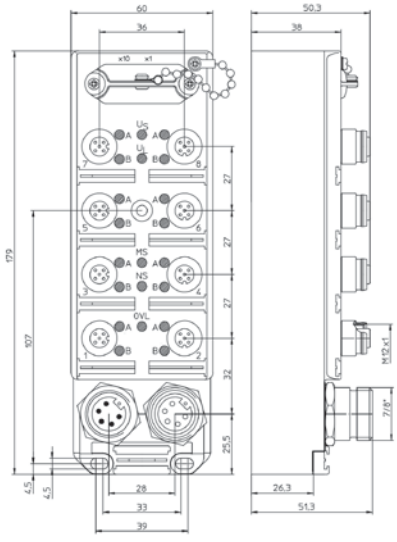
The diagnostic message of the fieldbus is made at the DeviceNet™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.

Pin Assignment

Bus Connection 7/8"	Input M12
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth



1 = System/sensors



0930 DSL 312 | 0930 DSL 313

DeviceNet™ – Digital Outputs

Technical Information

Product Description		
Type	**0930 DSL 107**	**0930 DSL 114**
		
Description	LioN-Classic DeviceNet™ device with 8 digital outputs (2 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles, 7/8" actuator supply, 3-poles	LioN-Classic DeviceNet™ device with 16 digital outputs (0.7 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles, 7/8" actuator supply, 3-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	570 g	
Bus System		
Transmission Rate	max. 500 kBaud	
Address Range	0 to 63	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	11 to 30 V DC	
Power Consumption	max. 80 mA	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs (Type 2 A acc. to IEC 61131-2)		
Rated Output Current	2 A per channel	0.7 A per channel
Short Circuit-proof	yes	
Max. Current Carrying Capacity	12 A per module	11.2 A per module
Number of Digital Channels	8	16
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0930 DSL 107

Bit	7	6	5	4	3	2	1	0
M12 Output								
Byte 0	8	7	6	5	4	3	2	1
Diagnostic Input								
Byte 0	–	–	–	–	–	–	ASC	UVA

ASC: Actuator short-circuit
UVA: Undervoltage actuator

Bit Assignment 0930 DSL 114

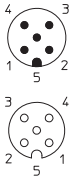
Bit	7	6	5	4	3	2	1	0
M12 Output								
Byte 0	8A	7A	6A	5A	4A	3A	2A	1A
Byte 1	8B	7B	6B	5B	4B	3B	2B	1B
Diagnostic Input								
Byte 0	–	–	–	–	–	–	ASC	UVA

Diagnostic Indication

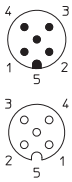
LED	Indicator	Condition
1...8 A (only 0930 DSL 107)	Yellow	Channel status
1...8 (only 0930 DSL 107)	Red	Actuator short-circuit/actuator overload
1...8 A/B (only 0930 DSL 114)	Yellow Red	Channel status Actuator short-circuit/actuator overload
U_S	Green	Actuator power supply
U_L	Green	Module electronic supply
MS (Module status)	Green Green blinking Red Red blinking Red/green blinking	Device is ready for operating Wrong configuration Unrecoverable fault Recoverable fault Self test is running
NS (Network status)	Green Green blinking Red blinking Red	Online, communication with PLC Online, no communication with PLC Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID

The diagnostic message of the fieldbus is made at the DeviceNet™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.

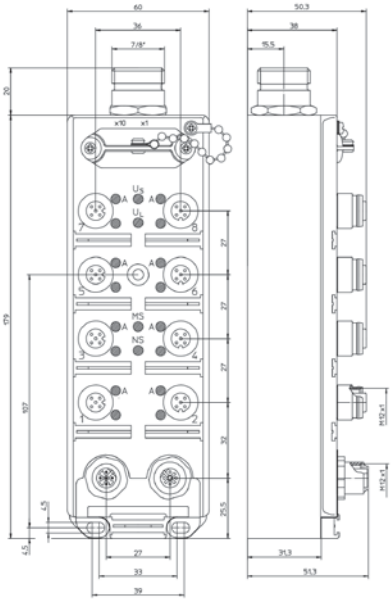
Pin Assignment 0930 DSL 107

Bus Connection M12	Actuator Supply 7/8"	Output M12
		
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = Earth 2 = +24 V 3 = GND (0 V)	1 = n.c. 2 = n.c. 3 = GND (0 V) 4 = OUT 5 = Earth

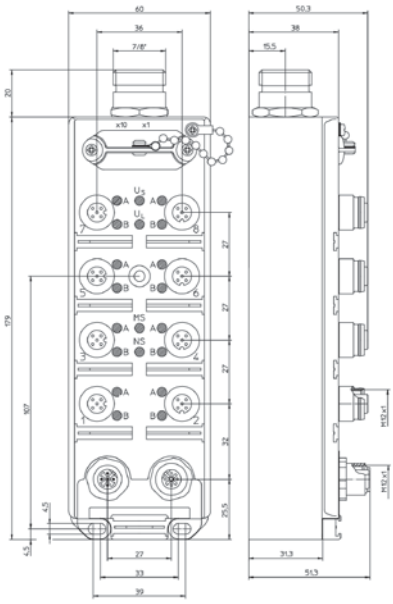
Pin Assignment 0930 DSL 114

Bus Connection M12	Actuator Supply 7/8"	Output M12
		
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = Earth 2 = +24 V 3 = GND (0 V)	1 = n.c. 2 = OUT B 3 = GND (0 V) 4 = OUT A 5 = Earth

1 = System



0930 DSL 107



0930 DSL 114

DeviceNet™ – Digital Outputs

Technical Information

Product Description		
Type	**0930 DSL 311**	**0930 DSL 315**
		
Description	LioN-Classic DeviceNet™ device with 8 digital outputs (2 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, 7/8" bus connection, 5-poles, 7/8" actuator supply, 3-poles	LioN-Classic DeviceNet™ device with 16 digital outputs (0.7 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, 7/8" bus connection, 5-poles, 7/8" actuator supply, 3-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	570 g	
Bus System		
Transmission Rate	max. 500 kBaud	
Address Range	0 to 63	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	11 to 30 V DC	
Power Consumption	max. 80 mA	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs (Type 2 A acc. to IEC 61131-2)		
Rated Output Current	2 A per channel	0.7 A per channel
Short Circuit-proof	yes	
Max. Current Carrying Capacity	12 A per module	11.2 A per module
Number of Digital Channels	8	16
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0930 DSL 311

Bit	7	6	5	4	3	2	1	0
M12 Output								
Byte 0	8	7	6	5	4	3	2	1
Diagnostic Input								
Byte 0	–	–	–	–	–	–	ASC	UVA

ASC: Actuator short-circuit
UVA: Undervoltage actuator

Bit Assignment 0930 DSL 315

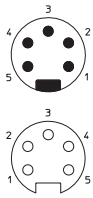
Bit	7	6	5	4	3	2	1	0
M12 Output								
Byte 0	8A	7A	6A	5A	4A	3A	2A	1A
Byte 1	8B	7B	6B	5B	4B	3B	2B	1B
Diagnostic Input								
Byte 0	–	–	–	–	–	–	ASC	UVA

Diagnostic Indication

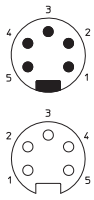
LED	Indicator	Condition
1...8 A (only 0930 DSL 311)	Yellow	Channel status
1...8 (only 0930 DSL 311)	Red	Actuator short-circuit/actuator overload
1...8 A/B (only 0930 DSL 315)	Yellow Red	Channel status Actuator short-circuit/actuator overload
U_S	Green	Actuator power supply
U_L	Green	Module electronic supply
MS (Module status)	Green Green blinking Red Red blinking Red/green blinking	Device is ready for operating Wrong configuration Unrecoverable fault Recoverable fault Self test is running
NS (Network status)	Green Green blinking Red blinking Red	Online, communication with PLC Online, no communication with PLC Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID

The diagnostic message of the fieldbus is made at the DeviceNet™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.

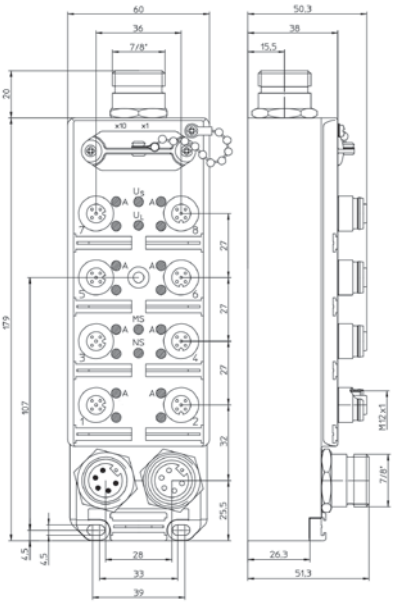
Pin Assignment 0930 DSL 311

Bus Connection 7/8"	Actuator Supply 7/8"	Output M12
		
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = Earth 2 = +24 V 3 = GND (0 V)	1 = n.c. 2 = n.c. 3 = GND (0 V) 4 = OUT 5 = Earth

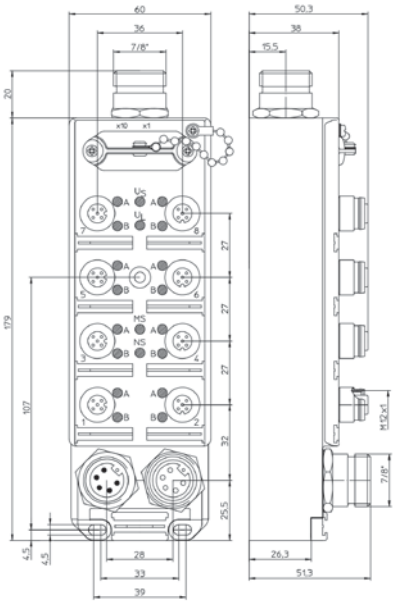
Pin Assignment 0930 DSL 315

Bus Connection 7/8"	Actuator Supply 7/8"	Output M12
		
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = Earth 2 = +24 V 3 = GND (0 V)	1 = n.c. 2 = OUT B 3 = GND (0 V) 4 = OUT A 5 = Earth

1 = System



0930 DSL 311



0930 DSL 315

The application of these products in harsh environments should always be checked before use.
Technical modifications reserved.

DeviceNet™ – Digital In- and Outputs

Technical Information

Product Description		
Type	**0930 DSL 113**	**0930 DSL 314**
		
Description	LioN-Classic DeviceNet™ device with 8 digital inputs to connect standard sensors and 8 digital outputs (0.5 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles, 7/8" actuator supply, 3-poles	LioN-Classic DeviceNet™ device with 8 digital inputs to connect standard sensors and 8 digital outputs (0.5 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, 7/8" bus connection, 5-poles, 7/8" actuator supply, 3-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	535 g	
Bus System		
Transmission Rate	max. 500 kBaud	
Address Range	0 to 63	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	11 to 30 V DC	
Power Consumption	max. 80 mA	
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	max. 800 mA	
Indicator	LED green	
Inputs (Type 2 acc. to IEC 611131-2)		
Rated Input Current	24 V DC	
Number of Digital Channels	8	
Status Indicator	LED green per channel	
Diagnostic Indicator	LED red per channel	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs (Type 0.5 A acc. to IEC 61131-2)		
Rated Output Current	0.7 A per channel	
Short Circuit-proof	yes	
Max. Current Carrying Capacity	5.6 A per module	
Number of Digital Channels	8	
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	7B	5B	3B	1B	7A	5A	3A	1A
M12 Output								
Byte 0	8B	6B	4B	2B	8A	6A	4A	2A
Diagnostic Input								
Byte 1	OVL	–	–	–	–	–	ASC	UVA

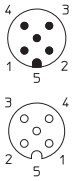
OVL: Overload status
ASC: Actuator short-circuit
UVA: Undervoltage actuator

Diagnostic Indication

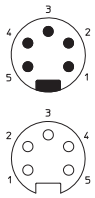
LED	Indicator	Condition
1...8 A/B	Yellow	Channel status
2, 4, 6, 8 A/B	Red	Actuator short-circuit/actuator overload
U_S	Green	Actuator power supply
U_L	Green	Module electronic supply
OVL	Red	Sensor short circuit/sensor overload
MS (Module status)	Green Green blinking Red Red blinking Red/green blinking	Device is ready for operating Wrong configuration Unrecoverable fault Recoverable fault Self test is running
NS (Network status)	Green Green blinking Red blinking Red	Online, communication with PLC Online, no communication with PLC Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID

The diagnostic message of the fieldbus is made at the DeviceNet™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.

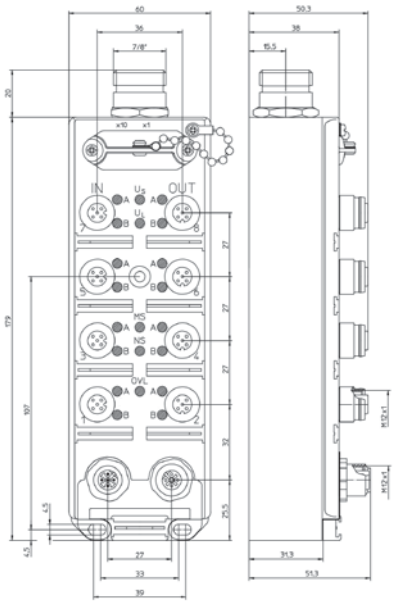
Pin Assignment 0930 DSL 113

Bus Connection M12	Actuator Supply 7/8″	In-/Output M12	
			
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = Earth 2 = +24 V 3 = GND	**IN** 1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth	**OUT** 1 = n.c. 2 = OUT B 3 = GND (0 V) 4 = OUT A 5 = Earth

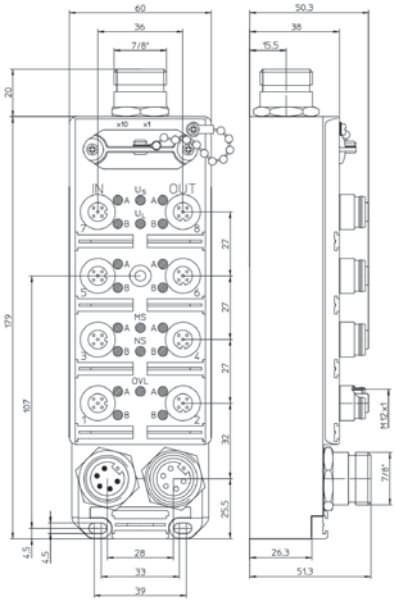
Pin Assignment 0930 DSL 314

Bus Connection 7/8″	Actuator Supply 7/8″	In-/Output M12	
			
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = Earth 2 = +24 V 3 = GND	**IN** 1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth	**OUT** 1 = n.c. 2 = OUT B 3 = GND (0 V) 4 = OUT A 5 = Earth

1 = System/sensors



0930 DSL 113



0930 DSL 314

DeviceNet™ – Universal

Technical Information

Product Description		
Type	**0930 DSL 650**	**0930 DSL 700**
		
Description	LioN-S DeviceNet™ device with 8 digital I/O channels, channels can be used universally as inputs or outputs, M8 socket, 3-poles, rotary switches for addressing, M12 bus connection, 5-poles, M12 actuator supply, 5-poles	LioN-M DeviceNet™ device with 16 digital I/O channels, channels can be used universally as inputs or outputs, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, 7/8" bus connection, 5-poles, 7/8" power supply, 4-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	-10°C to +60°C	
Weight	200 g	380 g
Bus System		
Transmission Rate	max. 500 kBaud	
Address Range	0 to 63	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	60 mA	90 mA
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	
Sensor Current	100 mA (at T_{amp} +30°C)	200 mA (at T_{amp} +30°C)
Indicator	LED green	
Inputs (Type 3 acc. to IEC 611131-2)		
Rated Input Current	24 V DC	
Number of Digital Channels	max. 8	max. 16
Status Indicator	LED green per channel	
Diagnostic Indicator	LED red per channel	LED red per socket
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs		
Rated Output Current	0.5 A per channel	1.6 A per channel
Short Circuit-proof	yes	
Max. Current Carrying Capacity	4 A per module	9 A per module
Number of Digital Channels	max. 8	max. 16
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	LED red per socket
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0930 DSL 650

Bit	7	6	5	4	3	2	1	0
	M8 Input/Output							
Byte 0	8	7	6	5	4	3	2	1
	Diagnostic							
Byte 1	S8	S7	S6	S5	S4	S3	S2	S1

S1 to 8: Socket status 1 to 8

Bit Assignment 0930 DSL 700

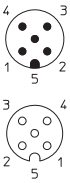
Bit	7	6	5	4	3	2	1	0
	M12 Input/Output							
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
Byte 1	8B	8A	7B	7A	6B	6A	5B	5A
	Diagnostic							
Byte 2	S8	S7	S6	S5	S4	S3	S2	S1

Diagnostic Indication

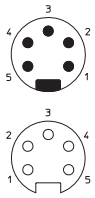
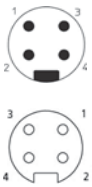
LED	Indicator	Condition
1...8 (only 0930 DSL 650)	Yellow Red	Channel status Periphery error
1...8 A/B (only 0930 DSL 700)	Yellow	Channel status
1...8 A/DIA (only 0930 DSL 700)	Red	Periphery error
U_S	Green	Sensor power supply
U_L	Green	Actuator power supply
MS (Module status)	Green Green blinking Red Red blinking Red/green blinking	Device is ready for operating Wrong configuration Unrecoverable fault Recoverable fault Self test is running
NS (Network status)	Green Green blinking Red blinking Red	Online, communication with PLC Online, no communication with PLC Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID

The diagnostic message of the fieldbus is made at the DeviceNet™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.

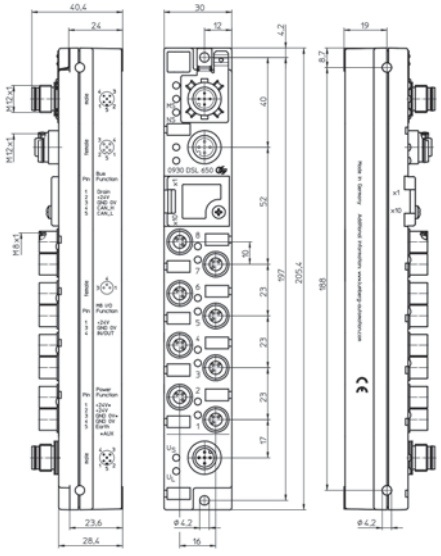
Pin Assignment 0930 DSL 650

Bus Connection M12	Actuator Supply M12	In-/Output M8
 1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L Housing = Earth	 1 = +24 V [2] 2 = +24 V [3] 3 = GND (0 V) [2] 4 = GND (0 V) [3] 5 = Earth	 1 = +24 V 3 = GND (0 V) 4 = IN/OUT

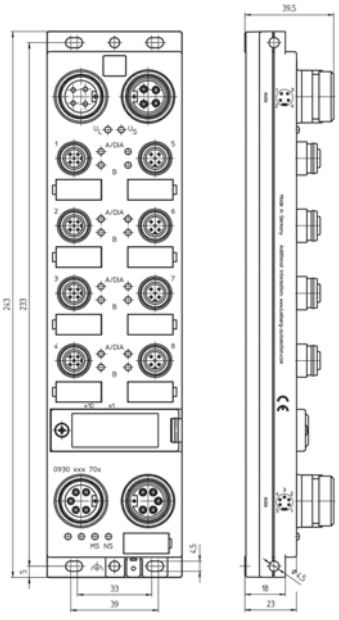
Pin Assignment 0930 DSL 700

Bus Connection 7/8"	Power Supply 7/8"	In-/Output M12
 1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L Housing = Earth	 1 = +24 V [2] 2 = +24 V [3] 3 = Earth 4 = GND (0 V) [2/3]	 1 = +24 V 2 = IN/OUT B 3 = GND (0 V) 4 = IN/OUT A 5 = Earth

1 = System: galvanically separated to sensors/actuators • 2 = Actuators • 3 = Sensors



0930 DSL 650



0930 DSL 700

The application of these products in harsh environments should always be checked before use.
Technical modifications reserved.

I/O Modules Active – Stand-Alone: CANopen®

Be certain. Belden.

CANopen® – for Decentralized Use

CANopen® is an open communication profile for the CAN Bus (Controller Area Network) developed for automotive engineering. In the meantime, CANopen® is used in different areas like medical technology, maritime, traffic control, utility vehicles and automation.

General Technical Data

Decentralized installation for optimal space savings in machines and systems

Transmission medium

The connection between individual stations (nodes) is implemented via a hybrid cable for the transmission of data as well as the system and sensor supply.

It comprises two twisted and shielded lead pairs and total sheathing:

- "Thick cable" as the master line and/or for the bridging of greater distances.
- "Thin cable" with smaller cable cross sections for stub cables and networks of smaller spatial expansion.

Network topology

Line structure or line structure with stub cables. The main line must be terminated with resistors (120 Ω) on both sides.

Number of devices

- 127 nodes (including master)

Admissible transmission rates and line lengths

The maximum admissible length of line depends on the Baud rate used and the number of modules.

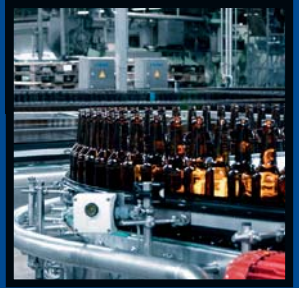
Transmission Rate	125 kbit/s	250 kbit/s	500 kbit/s	1.000 kbit/s
Max. line length	–	200 m	100 m	30 m
Max. line length stub line	–	3 m	1 m	0.3 m
Max. line length stub lines accumulated	–	78 m	39 m	3 m

Configuration of devices

The individual participants are projectioned by means of the EDS files (Electronic Data Sheet) which are provided by the manufacturer for each slave. The EDS files for the Lumberg Automation™ bus modules can be downloaded from www.lumberg-automation.com/downloads.

Addressing

Addressing is implemented via rotary address switches.



Matrix CANopen®

Function	Slots Bus Type		Slots I/O Type		Slots Power Type		
	M12	M23	M8	M12	M12	M23	7/8″
CANopen®							
LioN-S							
8 Digital IN	✓	–	✓	–	–	–	–
8 Digital IN/OUT (0.5 A)	✓	–	✓	–	✓	–	–
LioN-Classic							
16 Digital IN	✓	–	–	✓	–	–	–
8 Digital OUT (2 A)	✓	–	–	✓	–	–	✓
16 Digital OUT (0.5 A)	✓	–	–	✓	–	–	✓
8 Digital IN/8 Digital OUT (0.5 A)	✓	–	–	✓	–	–	✓
Accessories CANopen®							
Cord sets, single-ended	✓	–	✓	✓	–	–	✓
Cord sets, double-ended	✓	–	✓	✓	–	–	✓
Field attachable connectors	✓	–	✓	✓	–	–	✓
T-connectors	✓	–	–	✓	–	–	✓

CANopen® – Digital Inputs

Technical Information

Product Description			
Type	**0930 CSL 108**	**0930 CSL 109**	**0930 CSL 651**
			
Description	LioN-Classic CANopen® with 16 digital inputs (p-switching) to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles	LioN-Classic CANopen® device with 16 digital inputs (n-switching) to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles	LioN-S CANopen® device with 8 digital inputs to connect standard sensors, M8 socket, 3-poles, rotary switches for addressing, M12 bus connection, 5-poles
Technical Data			
Protection Class	IP67		
Environmental Temperature	0°C to +60°C		-10°C to +60°C
Weight	570 g		190 g
Bus System			
Transmission Rate	max. 1000 kBaud		max. 1 MBaud
Address Range	1 to 99		1 to 127
System/Sensors Power Supply			
Rated Voltage	24 V DC		
Voltage Range	11 to 30 V DC		
Power Consumption	max. 80 mA		60 mA
Input Power Supply			
Voltage Range	min. (U_{System} – 1.5 V)		
Sensor Current	max. 800 mA		100 mA (at T_{amp} +30°C)
Indicator	LED green		
Inputs	(Type 2 acc. to IEC 61131-2)		(Type 3 acc. to IEC 61131-2)
Rated Input Current	24 V DC		24 V DC
Number of Digital Channels	16		max. 8
Status Indicator	LED yellow per channel		LED yellow per channel
Diagnostic Indicator	–		LED red per channel
Included in Delivery			
M12 Dust Covers	2 pieces		
Attachable Labels	10 pieces		

Bit Assignment 0930 CSL 108/109

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	7B	7A	5B	5A	3B	3A	1B	1A
Byte 1	8B	8A	6B	6A	4B	4A	2B	2A
Diagnostic Input								
Byte 2	OVL	–	–	–	–	UVA	ASC	DIA

OVL: Overload status
UVA: Undervoltage actuator
ASC: Actuator short-circuit
DIA: Diagnostic

Bit Assignment 0930 CSL 651

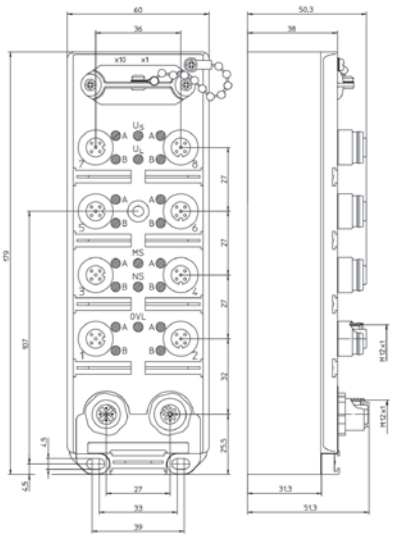
Bit	7	6	5	4	3	2	1	0
M8 Input								
Byte 0	8	7	6	5	4	3	2	1
Diagnostic								
Byte 1	0	0	0	0	0	SSC	0	SSUP
Byte 2	S8	S7	S6	S5	S4	S3	S2	S1

SSC: Sensor short-circuit
SSUP: Sensor underpower diagnostic
S1 to 8: Channel diagnostic 1 to 8

Diagnostic Indication 0930 CSL 108/109

LED	Indicator	Condition
1...8 A/B	Yellow	Channel status
Us	Green	Sensor power supply active
UL	Green	Module electronic supply active
OVL	Red	Sensor short circuit
MS (Module status)	Green Green blinking Red	PDO transfer with PLC No data communication, no connection to PLC the error setting is given to the outputs Invalid module address e.g. “0”
NS (Network status)	Green Green blinking Red blinking Red Red/green blinking Red fast blinking	Cyclic communication with PLC Searching for baudrate Warning bus connection Invalid bus connection No connection to PLC the error setting is given to the outputs Invalid module address e.g. “0”

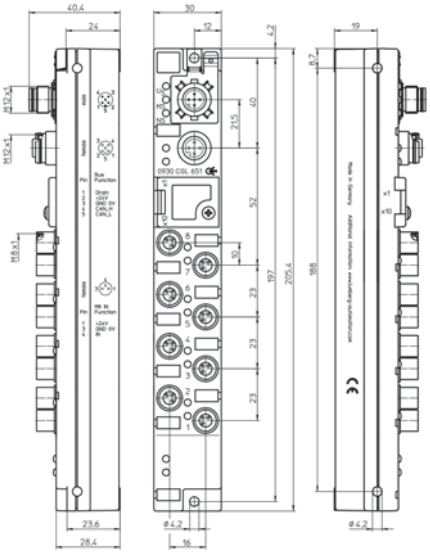
The diagnostic message of the fieldbus is made at the CANopen™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.



0930 CSL 108 | 0930 CSL 109

Diagnostic Indication 0930 CSL 651

LED	Indicator	Condition
1...8	Yellow Red	Channel status Periphery error
Us	Green	Sensor power supply active
MS (Module status)	Green Green blinking Red blinking Red/green blinking	Device is ready for operating 1 Hz CANopen® pre-operational, 2 Hz CANopen® STOP Recoverable fault, e.g. diagnostic CAN Reset
NS (Network status)	Green Green blinking Red/green blinking Red blinking Red	Online, communication with PLC 2 Hz searching for baudrate 1 Hz wrong configuration, e.g. cable length is oversized Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID



0930 CSL 651

Pin Assignment

Bus Connection M12	Input M12	Input M8
 1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	 1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth	 1 = +24 V 3 = GND (0 V) 4 = IN

1 = System/sensors

The application of these products in harsh environments should always be checked before use.
Technical modifications reserved.

CANopen® – Digital Outputs

Technical Information

Product Description		
Type	**0930 CSL 107**	**0930 CSL 114**
		
Description	LioN-Classic CANopen® device with 8 digital outputs (2 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles, 7/8" actuator supply, 3-poles	LioN-Classic CANopen® device with 16 digital outputs (0.5 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles, 7/8" actuator supply, 3-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	570 g	
Bus System		
Transmission Rate	max. 1000 kBaud	
Address Range	1 to 99	
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	11 to 30 V DC	
Power Consumption	max. 80 mA	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs	(Type 2 A acc. to IEC 61131-2)	(Type 0.5 A acc. to IEC 61131-2)
Rated Output Current	2 A per channel	0.7 A per channel
Short Circuit-proof	yes	
Max. Current Carrying Capacity	12 A per module	11.2 A per module
Number of Digital Channels	8	16
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0930 CSL 107

Bit	7	6	5	4	3	2	1	0
Diagnostic Input								
Byte 0	–	–	–	–	–	UVA	ASC	DIA
M12 Output								
Byte 0	8	7	6	5	4	3	2	1

UVA: Undervoltage actuator
ASC: Actuator short-circuit
DIA: Diagnostic

Bit Assignment 0930 CSL 114

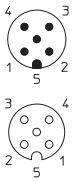
Bit	7	6	5	4	3	2	1	0
Diagnostic Input								
Byte 0	–	–	–	–	–	UVA	ASC	DIA
M12 Output								
Byte 0	7B	7A	5B	5A	3B	3A	1B	1A
Byte 1	8B	8A	6B	6A	4B	4A	2B	2A

Diagnostic Indication

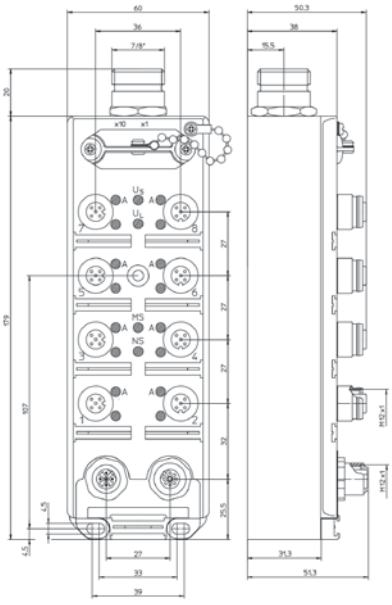
LED	Indicator	Condition
1...8 (only 0930 CSL 107)	Yellow Red	Channel status Actuator short circuit
1...8 A/B (only 0930 CSL 114)	Yellow Red	Channel status Actuator short circuit
U_S	Green	Actuator supply active
U_L	Green	Module electronic supply active
MS (Module status)	Green Green blinking Red	PDO transfer with PLC No data communication, no connection to PLC the error setting is given to the outputs Invalid module address e.g. “0”
NS (Network status)	Green Green blinking Red blinking Red Red/green blinking Red fast blinking	Cyclic communication with PLC Searching for baudrate Warning bus connection Invalid bus connection No connection to PLC the error setting is given to the outputs Invalid module address e.g. “0”

The diagnostic message of the fieldbus is made at the CANopen™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.

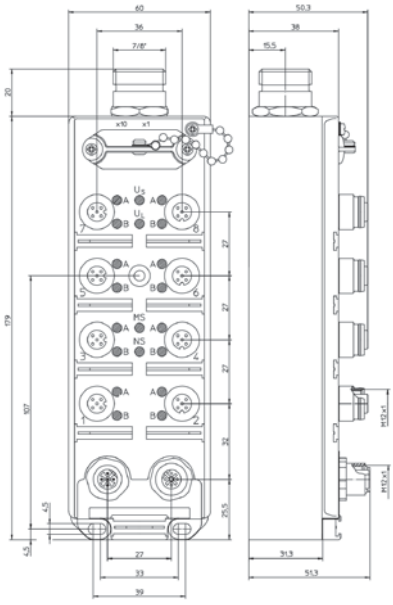
Pin Assignment

Bus Connection M12	Actuator Supply 7/8”	Output M12	
			**0930 CSL 107** / **0930 CSL 114**
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = Earth 2 = +24 V 3 = GND (0 V)		1 = n.c. 2 = n.c. 3 = GND (0 V) 4 = OUT 5 = Earth / 1 = n.c. 2 = OUT B 3 = GND (0 V) 4 = OUT A 5 = Earth

1 = System/sensors



0930 CSL 107



0930 CSL 114

CANopen® – Digital In- and Output, Universal

Technical Information

Product Description		
Type	**0930 CSL 113**	**0930 CSL 650**
		
Description	LioN-Classic CANopen® device with 8 digital inputs to connect standard sensors and 8 digital outputs (0.5 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, rotary switches for addressing, M12 bus connection, 5-poles, 7/8" actuator supply, 3-poles	LioN-S CANopen® device with 8 digital I/O channels, channels can be used universally as inputs or outputs, M8 socket, 3-poles, rotary switches for addressing, M12 bus connection, 5-poles, M12 actuator supply, 5-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	-10°C to +60°C
Weight	570 g	200 g
Bus System		
Transmission Rate	max. 1000 kBaud	max. 1 MBaud
Address Range	1 to 99	1 to 127
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	11 to 30 V DC	
Power Consumption	max. 80 mA	60 mA
Input Power Supply		
Voltage Range	min. (U_{System} – 1.5 V)	19 to 30 V DC
Sensor Current	max. 800 mA	100 mA (at T_{amp} +30°C)
Indicator	LED green	
Inputs	(Type 2 acc. to IEC 61131-2)	(Type 3 acc. to IEC 61131-2)
Rated Input Current	24 V DC	24 V DC
Number of Digital Channels	8	max. 8
Status Indicator	LED green per channel	LED yellow per channel
Diagnostic Indicator	LED red per channel	LED red per channel
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Reverse Polarity Protection	yes	yes/antiparallel diode
Indicator	LED green	
Outputs	(Type 0.5 A acc. to IEC 61131-2)	
Rated Output Current	0.7 A per channel	0.5 A per channel
Short Circuit-proof	yes	
Max. Current Carrying Capacity	5.6 A per module	4 A per module
Number of Digital Channels	8	max. 8
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0930 CSL 113

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
M12 Output								
Byte 0	8B	8A	6B	6A	4B	4A	2B	2A
Diagnostic Input								
Byte 1	OVL	–	–	–	–	UVA	ASC	DIA

OVL: Overload status • UVA: Undervoltage actuator
ASC: Actuator short-circuit
DIA: Diagnostic

Bit Assignment 0930 CSL 650

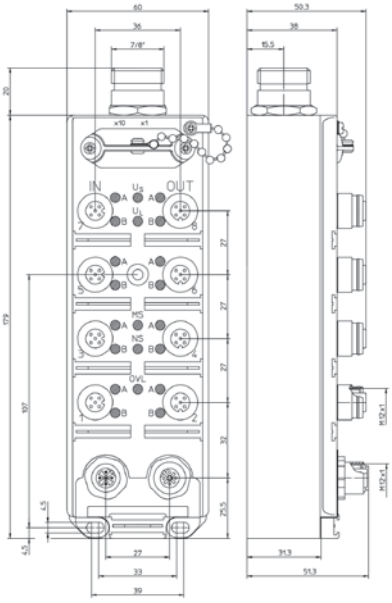
Bit	7	6	5	4	3	2	1	0
M8 Input								
Byte 0	8	7	6	5	4	3	2	1
M8 Output								
Byte 0	8	7	6	5	4	3	2	1
Diagnostic								
Byte 1	0	0	0	0	ASC	SSC	0	SSUP
Byte 2	S8	S7	S6	S5	S4	S3	S2	S1

SSC: Sensor short-circuit
SSUP: Sensor underpower diagnostic
S1 to 8: Channel diagnostic 1 to 8

Diagnostic Indication 0930 CSL 113

LED	Indicator	Condition
1...8 A/B	Yellow	Channel status
2, 4, 6, 8 A/B	Red	Actuator short circuit
U_S	Green	Sensor/actuator power supply active
U_L	Green	Module electronic supply active
OVL	Red	Sensor short circuit
MS (Module status)	Green Green blinking Red	PDO transfer with PLC No data communication, no connection to PLC the error setting is given to the outputs Invalid module address e.g. “0”
NS (Network status)	Green Green blinking Red blinking Red Red/green blinking Red fast blinking	Cyclic communication with PLC Searching for baudrate Warning bus connection Invalid bus connection No connection to PLC the error setting is given to the outputs Invalid module address e.g. “0”

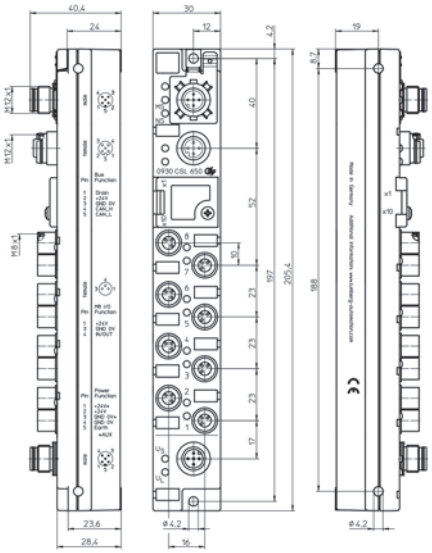
The diagnostic message of the fieldbus is made at the CANopen™ modules of Lumberg Automation™ via an additional input byte, which is appended to the standard input process data. Depending on the module, the diagnosis is communicated module- or port-related. It is generated if its an overload, an actuator low voltage and an actuator short-circuit. In addition, corresponding LEDs simplify troubleshooting.



0930 CSL 113

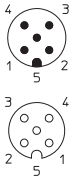
Diagnostic Indication 0930 CSL 650

LED	Indicator	Condition
1...8	Yellow Red	Channel status Periphery error
U_S	Green	Sensor power supply active
U_L	Green	Actuator power supply
MS (Module status)	Green Green blinking Red blinking Red/green blinking	Device is ready for operating 1 Hz CANopen® pre-operational, 2 Hz CANopen® STOP Recoverable fault, e.g. diagnostic CAN Reset
NS (Network status)	Green Green blinking Red/green blinking Red blinking Red	Online, communication with PLC 2 Hz searching for baudrate 1 Hz wrong configuration, e.g. cable length is oversized Time-out state of one or more I/O connections Failed communication device, Bus-off status, duplicate MAC-ID



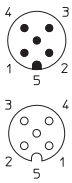
0930 CSL 650

Pin Assignment 0930 CSL 113

Bus Connection M12	Actuator Supply 7/8”	In-/Outputs M12	
			**IN** / **OUT**
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L	1 = Earth 2 = +24 V 3 = GND		1 = +24 V / 1 = n.c. 2 = IN B / 2 = OUT B 3 = GND (0 V) / 3 = GND (0 V) 4 = IN A / 4 = OUT A 5 = Earth / 5 = Earth

1 = System/sensors

Pin Assignment 0930 CSL 650

Bus Connection M12	Actuator Supply M12	In-/Outputs M8
		
1 = Drain 2 = +24 V [1] 3 = GND (0 V) [1] 4 = CAN_H 5 = CAN_L Housing = Earth	1 = +24 V [2] 2 = +24 V [3] 3 = GND (0 V) [2] 4 = GND (0 V) [3] 5 = Earth	1 = +24 V 3 = GND (0 V) 4 = IN/OUT

1 = System: galvanically separated to sensors/actuators • 2 = Actuators • 3 = Sensors

I/O Modules Active – Stand-Alone: Interbus®

Be certain. Belden.

Interbus® – a Fieldbus System

Interbus® is an internationally used fieldbus system. Since the first presentation of the system in 1987 the Interbus® has been modified, updated and improved and has become integral in numerous applications in the area of Automation Technology.

Lumberg Automation™ Products

To ensure the best application of the Interbus® in the decentralized sector, components must meet maximum electromechanical demands. The Lumberg Automation™ Interbus® components offer maximum protection for the electronic system due to the material used for the housing and the potting technology. The connection for Interbus® and the power supply of the module electronics, sensors as well as actuator system is implemented via M23 connectors. Bus terminals or TAPs are available for the connection to the bus.

General Technical Data

Absolute protection of electronics, thanks to use of high-quality components

Transmission medium

- Shielded twisted pair copper cable for differential signal transmission acc. to RS422 (RS485)
- Fiber optic cable
- Hybrid cable for the joint transmission of power supply and data with the installation remote bus

Network topology

Physically, Interbus® is built as a ring. Due to special cabling systems (e.g. transmit and receive lines in one cable, special T-connectors) it resembles a tree structure.

Partial systems in the Interbus®

- The Remote Bus (RBUS) has been designed for long distances. It connects the master with the first bus terminal and general remote bus participants with each other. A drop line from the remote bus is permitted and called a remote bus drop.
- The Installation Remote Bus is a variant of the remote bus. Apart from actual data lines the power supply for the module electronics and sensors is conducted in the Installation Remote Bus Cable.
- A Local Bus (LBUS) is a bus connection branching from the remote bus via a bus terminal and connecting the local bus participants with each other. Different variants of the local bus exist.

Number of devices

- Maximum 254 remote bus participants
- Total of 512 participants with max. 4096 I/O points

Configuration of devices

Projectioning does not require module-specific data, because the basic data are saved in the module. The relevant libraries can be used for a detailed or offline projectioning. The libraries for the Lumberg Automation™ modules can be downloaded from www.lumberg-automation.com/downloads.

Admissible transmission rates and line lengths

- Transmission rate: 500 kBit/s
- Overall remote bus length: 12.8 km
- Maximum distance between remote bus participants: 400 m
- Length of the installation remote bus: 50 m
- Distance between installation remote bus participants: 50 m
- Admissible current load of the installation remote bus: 4.5 A

Addressing

Modules are addressed automatically during the start-up of the bus depending on the physical position of the participants in the bus.

Matrix Interbus®

Function	Slots Bus Type		Slots I/O Type		Slots Power Type		
	M12	M23	M8	M12	M12	M23	7/8″
Interbus®							
LioN-Classic							
8 Digtal IN	–	✓	–	✓	–	✓	–
16 Digital IN	–	✓	–	✓	–	–	–
8 Digital OUT (2 A)	–	✓	–	✓	–	✓	–
8 Digital IN/4 Digital OUT (2 A)	–	✓	–	✓	–	✓	–
Accessories Interbus®							
Cord sets, single-ended	–	✓	–	✓	–	✓	–
Cord sets, double-ended	–	✓	–	✓	–	✓	–
Field attachable connectors	–	✓	–	✓	–	✓	–
T-connectors	–	–	–	✓	–	✓	–

Interbus® – Digital Inputs

Technical Information

Product Description			
Type	**0950 ISL 205**	**0950 ISL 202**	**0950 ISL 204**
			
Description	LioN-Classic Interbus® device, remote bus terminal with integrated branch for an installation remote bus, 8 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, M23 bus connection, 9-poles, M23 power supply, 6-poles	LioN-Classic Interbus® device, installation remote bus with 8 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, M23 bus connection, 9-poles	LioN-Classic Interbus® device, installation remote bus with 16 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, 5-poles, M23 bus connection, 9-poles
Technical Data			
Protection Class	IP67		
Environmental Temperature	0°C to +60°C		
Weight	580 g	500 g	
Bus System			
ID Number	11 dec	10 dec	02 dec
System/Sensors Power Supply			
Rated Voltage	24 V DC		
Voltage Range	19 to 30 V DC		
Power Consumption	typ. 120 mA		
Input Power Supply			
Voltage Range	min. (UL – 1.5 V)		
Sensor Current	max. 800 mA		
Indicator	LED green		
Inputs (Type 2 acc. to IEC 61131-2)			
Rated Input Current	24 V DC		
Number of Digital Channels	16		
Channel Type N.O.	p-switching		
Status Indicator	LED yellow per channel		
Included in Delivery			
M12 Dust Covers	2 pieces		
Attachable Labels	10 pieces		

Diagnostic Indication

LED	Indicator	Condition
1...8	Yellow	Channel status
1...8 A/B (only 0950 ISL 204)	Yellow	Channel status
ERR (only 0950 ISL 205)	Red	Installation remote bus defective
U_S (only 0950 ISL 202/204)	Green	Sensor supply active
U_L	Green	Module electronic supply active
BA	Green	Bus active
RC	Green	Remote bus-in connected
RD	Red	Continuing remote bus disconnected
LD (only 0950 ISL 205)	Red	Installation field bus disconnected
OVL	Red	Sensor short circuit/sensor overload

Pin Assignment 0950 ISL 205

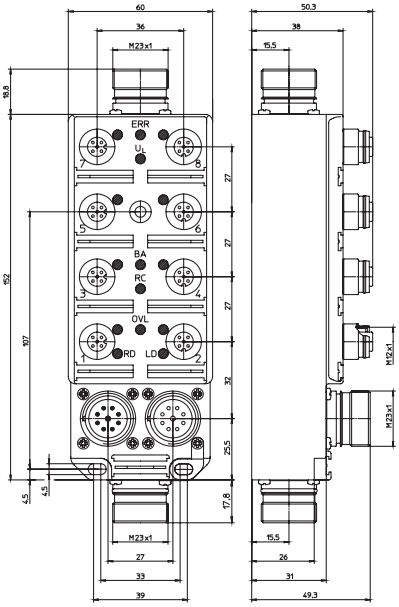
Bus Connection Input M23	Bus Connection Output M23	Inst. Remote Bus Output M23
		
1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = n.c. 7 = n.c. 8 = n.c. 9 = n.c. Housing = Earth	1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = n.c. 7 = n.c. 8 = n.c. 9 = LBST Housing = Earth	1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = Earth 7 = +24 V 8 = GND (0 V) 9 = RBST Housing = Earth

Power Supply M23	Input M12
	
1 = Earth 2 = +24 V [1] 3 = GND (0 V) [1] 4 = +24 V [2] 5 = GND (0 V) [2] 6 = n.c.	1 = +24 V 2 = n.c. 3 = GND (0 V) 4 = IN 5 = Earth

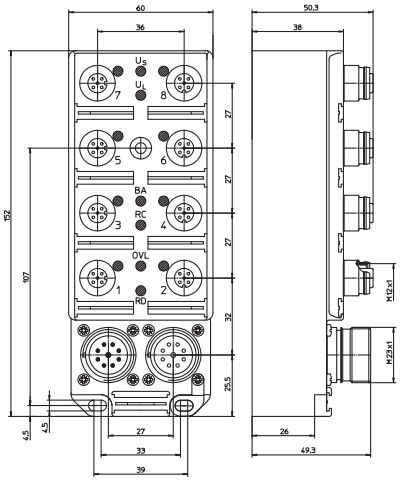
1 = Installation remote bus • 2 = Module supply/sensors

Pin Assignment 0950 ISL 202/204

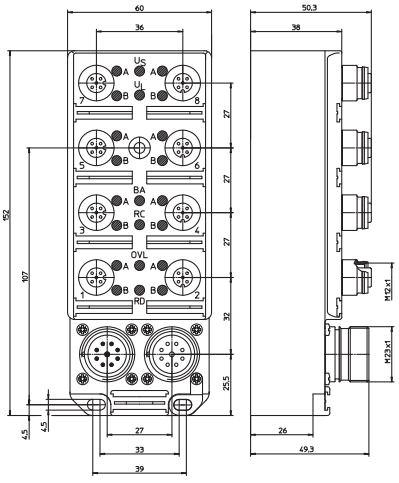
Bus Connection Input M23	Bus Connection Output M23	Input M12	
			
1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = Earth 7 = +24 V 8 = GND (0 V) 9 = n.c. Housing = Earth	1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = Earth 7 = +24 V 8 = GND (0 V) 9 = RBST Housing = Earth	**0950 ISL 202** 1 = +24 V 2 = n.c. 3 = GND (0 V) 4 = IN 5 = Earth	**0950 ISL 204** 1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth



0950 ISL 205



0950 ISL 202



0950 ISL 204

Interbus® – Digital Outputs

Technical Information

Product Description		
Type	**0950 ISL 201**	**0950 ISL 207**
		
Description	LioN-Classic Interbus® device, installation remote bus with 8 digital outputs to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, M23 bus connection, 9-poles, M23 power supply, 6-poles	LioN-Classic Interbus® device, installation remote bus with 8 digital outputs (2 A) to connect standard actuators, without actuator low voltage report, combined FIXCON®/M12 socket, 5-poles, M23 bus connection, 9-poles, M23 power supply, 6-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	580 g	
Bus System		
ID Number	09 dec	01 dec
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	typ. 70 mA	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Indicator	LED green	
Outputs (Type 2 A acc. to IEC 61131-2)		
Rated Output Current	2 A per channel	
Short Circuit-proof	yes	
Max. Current Carrying Capacity	15 A per module	
Number of Digital Channels	8	
Channel Type N.O.	p-switching	
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

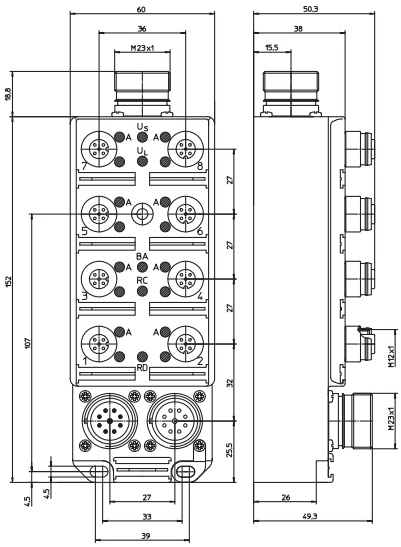
Diagnostic Indication

LED	Indicator	Condition
1...8 A	Yellow	Channel status
1...8	Red	Actuator short-circuit/actuator overload
U_S	Green	Actuator supply active
U_L	Green	Module electronic supply active
BA	Green	Bus active
RC	Green	Remote bus-in connected
RD	Red	Continuing remote bus disconnected

Pin Assignment

Bus Connection Input M23	Bus Connection Output M23
	
1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = Earth 7 = +24 V 8 = GND (0 V) 9 = n.c. Housing = Earth	1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = Earth 7 = +24 V 8 = GND (0 V) 9 = RBST Housing = Earth

Power Supply M23	Output M12
	
1 = Earth 2 = +24 V 3 = GND (0 V) 4 = n.c. 5 = n.c. 6 = n.c.	1 = n.c. 2 = n.c. 3 = GND (0 V) 4 = OUT 5 = Earth



0950 ISL 201 | 0950 ISL 207

Interbus® – Digital In- and Outputs

Technical Information

Product Description		
Type	**0950 ISL 203**	**0950 ISL 209**
		
Description	LioN-Classic Interbus® device, installation remote bus with 8 digital inputs to connect standard sensors and 4 digital outputs (2 A) to connect standard actuators, combined FIXCON®/M12 socket, 5-poles, M23 bus connection, 9-poles, M23 power supply, 6-poles, with potential separation	LioN-Classic Interbus® device, installation remote bus with 8 digital inputs to connect standard sensors and 4 digital outputs (2 A) to connect standard actuators, without actuator low voltage report, combined FIXCON®/M12 socket, 5-poles, M23 bus connection, 9-poles, M23 power supply, 6-poles
Technical Data		
Protection Class	IP67	
Environmental Temperature	0°C to +60°C	
Weight	580 g	
Bus System		
ID Number	35 dec	03 dec
System/Sensors Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Power Consumption	typ. 80 mA	
Input Power Supply		
Voltage Range	min. (UL – 1.5 V)	
Sensor Current	max. 800 mA	
Indicator	LED green	
Inputs		
Rated Input Current	24 V DC	
Number of Digital Channels	8	
Channel Type N.O.	p-switching	
Status Indicator	LED yellow per channel	
Output Power Supply		
Rated Voltage	24 V DC	
Voltage Range	19 to 30 V DC	
Indicator	LED green	
Outputs (Type 0.5 A acc. to IEC 61131-2)		
Rated Output Current	2 A per channel	
Short Circuit-proof	yes	
Max. Current Carrying Capacity	4 A per module	
Number of Digital Channels	4	
Channel Type N.O.	p-switching	
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red per channel	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

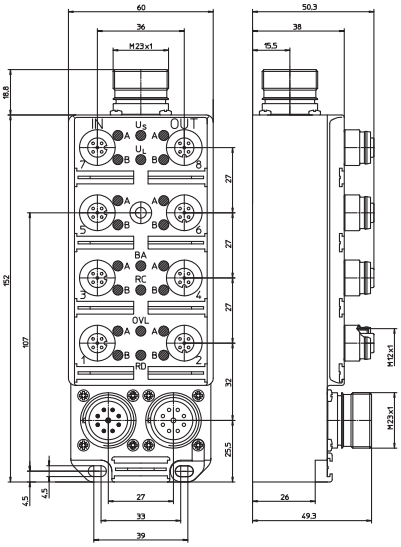
Diagnostic Indication

LED	Indicator	Condition
1, 3, 5, 7 A/B	Yellow	Channel status
2, 4, 6, 8 A	Yellow	Channel status
2, 4, 6, 8	Red	Actuator short-circuit/actuator overload
U_S	Green	Actuator supply active
U_L	Green	Module electronic supply active
BA	Green	Bus active
RC	Green	Remote bus-in connected
RD	Red	Continuing remote bus disconnected
OVL	Red	Sensor short circuit/sensor overload

Pin Assignment

Bus Connection Input M23	Bus Connection Output M23
	
1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = Earth 7 = +24 V 8 = GND (0 V) 9 = n.c. Housing = Earth	1 = DO 2 = DO 3 = DI 4 = DI 5 = COM 6 = Earth 7 = +24 V 8 = GND (0 V) 9 = RBST Housing = Earth

Power Supply M23	In-/Output M12		
		**IN**	**OUT**
1 = Earth 2 = +24 V 3 = GND (0 V) 4 = n.c. 5 = n.c. 6 = n.c.		1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = Earth	1 = n.c. 2 = n.c. 3 = GND (0 V) 4 = OUT 5 = Earth



0950 ISL 203 | 0950 ISL 209

I/O Modules Active – Stand-Alone: AS-Interface

Be certain. Belden.

Actuator Sensor-Interface (AS-Interface)

AS-Interface was designed as a simple system for the quick data exchange of binary signals. An international standard since 1999, in accordance with EN 50295 and IEC 62026-2.

Quick and Uncomplicated

The biggest advantage of AS-Interface is the quick and uncomplicated installation of the system. Communication (Manchester Encoding) and energy are transmitted via a 2-wire cable. By using piercing technology for contacting the cable it is possible to insert a new slave at any point in the system. In addition, the arbitrary structure of the bus (line, tree, star, ...) permits the perfect adaptation to the plant or machine. AS-Interface is mainly used for small machines, as a subsystem for more complex bus systems (e.g. PROFIBUS-DP) or as an easy introduction to bus technology.

General Technical Data

Cost-efficient and innovative components for demanding actuator/sensor networks

Transmission medium

- Unshielded 2-wire cable for power supply (module electronics and sensors) and data transmission (Manchester Encoding)
- Optional mechanically encoded flat or round cable

Network topology

The bus can be built arbitrarily (line, star, tree, ...). Terminating resistors are not required.

Number of devices

- 31 slaves by using standard slaves
- 62 slaves by using A/B slaves with profile 3.0

Configuration of devices

No module-specific data is required for configuration, since the basic data is contained in the module. Appropriate libraries can be used for detailed or offline configuration. The libraries for Lumberg Automation™ modules can be downloaded from www.lumberg-automation.com/downloads.

Reliable transmission rates and segment lengths

- Transmission rate: 167 kBaud
- Max. segment length: 100 m

Addressing

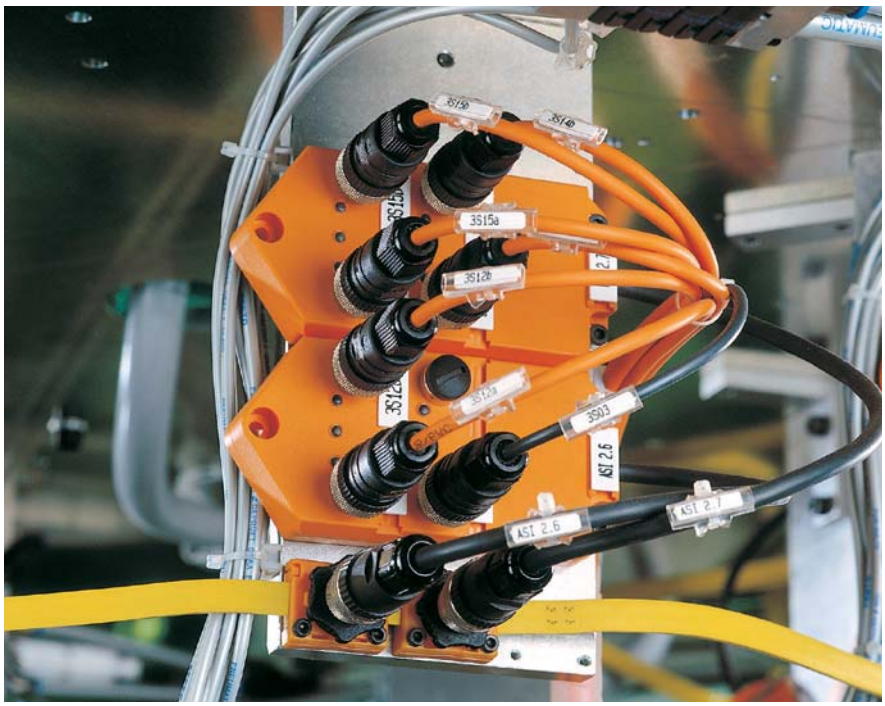
AS-Interface slaves are generally addressed via software (the default address is generally "0" for all AS-Interface slaves).

This can be done in several ways:

- Via the master: The slaves are connected to the master consecutively. The latter automatically identifies the kind of slave and builds up a communication. Then the slave can be addressed.
- Via an addressing unit: All AS-Interface slaves can be addressed with the standard addressing unit "0913 ATL 003".
- Automatic addressing: If a slave in a network fails, AS-Interface offers the chance of auto-addressing. The defective slave is replaced by an identical one. The master identifies this slave and automatically addresses it to the address of the missing slave.

Matrix AS-Interface

Function	Slots Bus Type			Slots I/O Type	
	M8	M12	Flat Cable	M8	M12
AS-Interface					
LioN-Classic					
4 Digital IN	✓	–	✓	✓	✓
8 Digital IN	–	–	✓	–	✓
4 Digital OUT (2 A)	–	–	✓	–	✓
2 Digital IN/2 Digital OUT (2 A)	–	–	✓	–	✓
4 Digital IN/4 Digital OUT (2 A)	–	✓	✓	–	✓
Accessories AS-Interface					
Cord sets, single-ended	✓	✓	–	✓	✓
Cord sets, double-ended	✓	✓	–	✓	✓
Field attachable connectors	✓	✓	–	✓	✓
T-connectors	–	✓	–	✓	✓



AS-Interface – Digital Inputs

Technical Information

Product Description			
Type	**0910 ASL 501**	**0910 ASL 409**	**0910 ASL 412**
			
Description	LioN-Classic AS-Interface module with 4 digital inputs to connect M8 standard sensors, M8 bus connection	LioN-Classic AS-Interface flat cable module with 4 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, infrared interface for the addressing	LioN-Classic AS-Interface flat cable module with 8 digital inputs to connect standard sensors, combined FIXCON®/M12 socket, infrared interface for the addressing
Note	–	The input channels are connected together. That allows a greater connection flexibility (see pin assignment). In case of connection of a two-channel sensor to input socket 1 or 3 a further sensor must not be plugged to input socket 2 or 4 respectively due to the Y wiring of the inputs.	
Technical Data			
Protection Class	IP67		
Environmental Temperature	-15°C to +60°C	-25°C to +60°C	-15°C to +60°C
Weight	100 g	200 g	300 g
Bus System			
AS-Interface Profile	S.0.A.E		
Support A/B Addressing	yes		
System/Sensors Power Supply			
Rated Voltage	AS-Interface net		
Voltage Range	26.5 to 31.6 V DC		
Power Consumption	max. 120 mA		
Input Power Supply			
Voltage Range	AS-Interface net 17 to 30 V DC		
Sensor Current	max. 100 mA		
Indicator	LED green		
Inputs (Type 2 acc. to IEC 61131-2)			
Rated Input Current	24 V DC		
Number of Digital Channels	4		8
Status Indicator	LED yellow per channel		
Diagnostic Indicator	LED red		
Included in Delivery			
M12 Dust Covers	2 pieces		
Attachable Labels	10 pieces		

Bit Assignment 0910 ASL 501

Bit	–	–	–	–	3	2	1	0
	M12 Input							
Byte 0	–	–	–	–	I-4	I-3	I-2	I-1

Bit Assignment 0910 ASL 409

Bit	–	–	–	–	3	2	1	0
	M12 Input							
Byte 0	–	–	–	–	I-4	I-3/4	I-2	I-1/2

Bit Assignment 0910 ASL 412

Bit	–	–	–	–	3	2	1	0
	M12 Input							
Byte 0/Slave 1	–	–	–	–	I-4	I-3	I-2	I-1
Byte 1/Slave 2	–	–	–	–	I-4	I-3	I-2	I-1

According to the AS-Interface specification 3.0, periphery errors like short circuits or overloads can be sent to the master in the form of a collective diagnosis. In addition, there is a status LED on the relevant slave.

Diagnostic Indication 0910 ASL 501

LED	Indicator	Condition
1...4	Yellow	Channel status
AS-i-Dia	Green Red Red blinking	Slave is involved in data transfer communications error, no data transfer (e.g. slave address 0) Periphery error (e.g. sensor supply overload or short circuit)

Diagnostic Indication 0910 ASL 409/412

LED	Indicator	Condition
I-1...4	Yellow	Channel status
U-AS-i	Green	AS-Interface power supply active
FID	Red Red blinking	Communication error Periphery error (sensor/actuator short circuit)

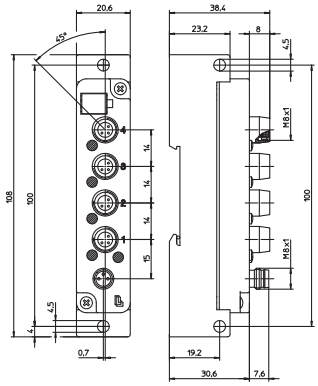
Pin Assignment 0910 ASL 501

Bus Connection M8		Input M8	
	1 = AS-Interface + 3 = AS-Interface - 4 = n.c.		1 = +24 V 4 = GND (0 V) 3 = IN

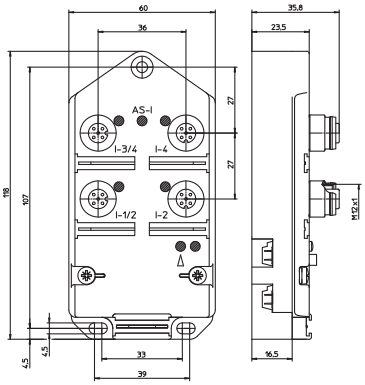
Pin Assignment 0910 ASL 409/412

Input M12				
	**Input 1**	**Input 2**	**Input 3**	**Input 4**
	1 = +24 V 2 = IN 2 3 = GND (0 V) 4 = IN 1 5 = Earth	1 = +24 V 2 = n.c. 3 = GND (0 V) 4 = IN 2 5 = Earth	1 = +24 V 2 = IN 4 3 = GND (0 V) 4 = IN 3 5 = Earth	1 = +24 V 2 = n.c. 3 = GND (0 V) 4 = IN 3 5 = Earth

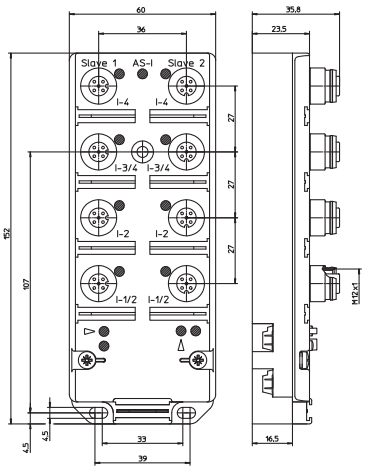
The connection to earth for the inputs is implemented via the earthing contacts at the fastening holes.



0910 ASL 501



0910 ASL 409



0910 ASL 412

AS-Interface – Digital Outputs

Technical Information

Product Description	
Type	**0910 ASL 403**
	
Description	LioN-Classic AS-Interface flat cable module with 4 digital outputs (p-switching) to connect standard actuators, 4 x M12 socket
Technical Data	
Protection Class	IP67
Environmental Temperature	-25°C to +80°C
Weight	200 g
Bus System	
AS-Interface Profile	8.0
Support A/B Addressing	no
System/Sensors Power Supply	
Rated Voltage	AS-Interface net
Voltage Range	26.5 to 31.6 V DC
Power Consumption	max. 75 mA
Output Power Supply (AUX)	
Rated Voltage	24 V DC
Voltage Range	10 to 30 V DC
Reverse Polarity Protection	yes
Indicator	LED green
Outputs (Type 2 A acc. to IEC 61131-2)	
Rated Output Current	2 A per channel
Short Circuit-proof	yes
Max. Current Carrying Capacity	4 A per module
Number of Digital Channels	4
Status Indicator	LED yellow per channel
Included in Delivery	
M12 Dust Covers	2 pieces
Attachable Labels	10 pieces

Bit Assignment

Bit	-	-	-	-	3	2	1	0
	M12 Output							
Byte 0	–	–	–	–	O-4	O-3	O-2	O-1

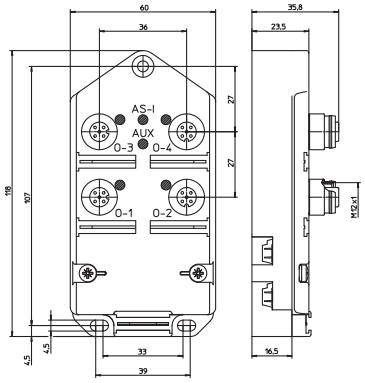
Diagnostic Indication

LED	Indicator	Condition
O-1...4	Yellow	Channel status
U-AS-i	Green	AS-Interface power supply active
AUX	Green	Actuator supply active

Pin Assignment

Output M12

1 = n.c.
2 = n.c.
3 = GND (0 V)
4 = OUT
5 = Earth



0910 ASL 403

AS-Interface – Digital In- and Outputs

Technical Information

Product Description			
Type	**0910 ASL 410**	**0910 ASL 408**	**0910 ASL 438**
			
Description	LioN-Classic AS-Interface flat cable module with 2 digital inputs to connect standard sensors and 2 digital outputs to connect standard actuators, combined FIXCON®/M12 socket, infrared interface for the addressing	LioN-Classic AS-Interface flat cable module with 4 digital inputs to connect standard sensors and 4 digital outputs to connect standard actuators, combined FIXCON®/M12 socket, infrared interface for the addressing	LioN-Classic AS-Interface flat cable module with 4 digital inputs for 2-wire or 3-wire sensors and 4 digital outputs to connect standard actuators, M12 socket, infrared interface for the addressing
Note	The input channels are connected together. That allows a greater connection flexibility (see pin assignment). In case of connection of a two-channel sensor to input socket 1 a further sensor must not be plugged to input socket 2 respectively due to the Y wiring of the inputs.	The input channels are connected together. That allows a greater connection flexibility (see pin assignment). In case of connection of a two-channel sensor to input socket 1 or 3 a further sensor must not be plugged to input socket 2 or 4 respectively due to the Y wiring of the inputs.	This module corresponds to the AS-i specification 3.0 and can only be operated on a master server, which is also 3.0. The input and output channels are connected together. That allows a greater connection flexibility (see pin assignment). In case of connection of a two-channel sensor/actuator to input/output socket 1 or 3 a further sensor/actuator must not be plugged to input/output socket 2 or 4 respectively due to the Y wiring of the inputs/outputs.
Technical Data			
Protection Class	IP67		
Environmental Temperature	-25°C to +60°C		-25°C to +80°C
Weight	200 g		300 g
Bus System			
AS-Interface Profile	S -3.F. E	S-.F.E	S-7.A.7
Support A/B Addressing	no		yes
System/Sensors Power Supply			
Rated Voltage	AS-Interface net		
Voltage Range	26.5 to 31.6 V DC		
Power Consumption	max. 250 mA		
Input Power Supply			
Voltage Range	24 V DC		
Sensor Current	10 to 30 V DC		
Indicator	LED green		
Inputs (Type 2 acc. to IEC 61131-2)			
Rated Input Current	24 V DC		
Number of Digital Channels	2		
Status Indicator	LED green per channel		
Output Power Supply (AUX)			
Rated Voltage	24 V DC		
Voltage Range	10 to 30 V DC		
Reverse Polarity Protection	yes		
Indicator	LED green		
Outputs (Type 2 A acc. to IEC 61131-2)			
Rated Output Current	2 A per channel		
Short Circuit-proof	yes		
Max. Current Carrying Capacity	4 A per module		
Number of Digital Channels	2		
Status Indicator	LED yellow per channel		
Diagnostic Indicator	LED red		
Included in Delivery			
M12 Dust Covers	2 pieces		
Attachable Labels	10 pieces		

Bit Assignment 0910 ASL 408

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	–	–	–	–	1-4	1-3/4	1-2	1-1/2
M12 Output								
Byte 0	–	–	–	–	O-4	O-3	O-2	O-1

Bit Assignment 0910 ASL 410

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	–	–	–	–	–	–	1-2	1-1/2
M12 Output								
Byte 0	–	–	–	–	O-4	O-3	–	–

Bit Assignment 0910 ASL 438

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	–	–	–	–	1-4	1-3/4	1-2	1-1/2
M12 Output								
Byte 0	–	–	–	–	O-4	O-3/4	O-2	O-1/2

Diagnostic Indication

LED	Indicator	Condition
I-1..2/O-3..4 (only 0910 ASL 410)	Yellow	Channel status
I-1..4/O-1..4 (only 0910 ASL 408/438)	Yellow	Channel status
U-AS-i	Green	AS-Interface power supply active
AUX	Green	Actuator supply active
FID	Red Red blinking	Communication error Periphery error (sensor/actuator short circuit)

Periphery errors like short circuits or overloads can be sent to the master in the form of a collective diagnosis.
In addition, there is a status LED on the relevant slave.

Pin Assignment 0910 ASL 410

Input M12

Input 1	Input 2
1 = +24 V	1 = +24 V
2 = IN 2	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)
4 = IN 1	4 = IN 2
5 = Earth	5 = Earth

Output M12

Output 1	Output 2
1 = n.c.	1 = n.c.
2 = n.c.	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)
4 = OUT 3	4 = OUT 4
5 = Earth	5 = Earth

Pin Assignment 0910 ASL 408

Input M12

Input 1	Input 2	Input 3	Input 4
1 = +24 V	1 = +24 V	1 = +24 V	1 = +24 V
2 = IN 2	2 = n.c.	2 = IN 4	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)
4 = IN 1	4 = IN 2	4 = IN 3	4 = IN 4
5 = Earth	5 = Earth	5 = Earth	5 = Earth

Output M12

Output 1	Output 2	Output 3	Output 4
1 = n.c.	1 = n.c.	1 = n.c.	1 = n.c.
2 = n.c.	2 = n.c.	2 = n.c.	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)
4 = OUT 1	4 = OUT 2	4 = OUT 3	4 = OUT 4
5 = Earth	5 = Earth	5 = Earth	5 = Earth

Pin Assignment 0910 ASL 438

AUX

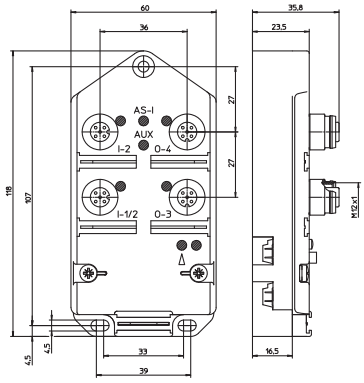
1 = AS-Interface +
2 = Auxiliary power -
3 = AS-Interface -
4 = Auxiliary power +
5 = n.c.

Input M12

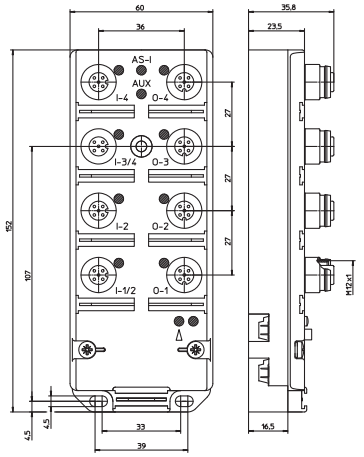
Input 1	Input 2	Input 3	Input 4
1 = +24 V	1 = +24 V	1 = +24 V	1 = +24 V
2 = IN 2	2 = n.c.	2 = IN 4	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)
4 = IN 1	4 = IN 2	4 = IN 3	4 = IN 4
5 = Earth	5 = Earth	5 = Earth	5 = Earth

Output M12

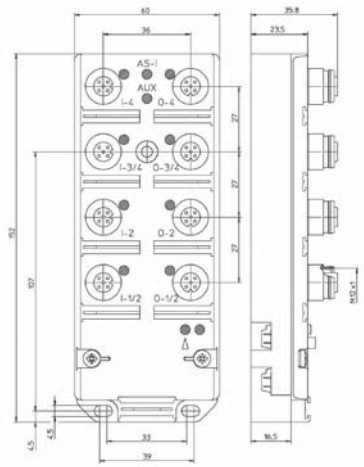
Output 1	Output 2	Output 3	Output 4
1 = n.c.	1 = n.c.	1 = n.c.	1 = n.c.
2 = OUT 2	2 = n.c.	2 = OUT 4	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)
4 = OUT 1	4 = OUT 2	4 = OUT 3	4 = OUT 4
5 = Earth	5 = Earth	5 = Earth	5 = Earth



0910 ASL 410



0910 ASL 408



0910 ASL 438

AS-Interface – Digital In- and Outputs

Technical Information

Product Description		
Type	**0910 ASL 146**	**0910 ASL 425**
		
Description	LioN-Classic AS-Interface flat cable module with M12 bus connection and 4 digital inputs for 2-wire or 3-wire sensors and 4 digital outputs to connect standard actuators, M12 socket	LioN-Classic AS-Interface module with housing and receptacle shells in stainless steel, 4 digital inputs to connect standard sensors and 4 digital outputs (2 A) to connect standard actuators, M12 bus connection
Note	This module corresponds to the AS-i specification 3.0 and can only be operated on a master server, which is also 3.0. The input and output channels are connected together. That allows a greater connection flexibility (see pin assignment). In case of connection of a two-channel sensor/actuator to input/output socket 1 or 3 a further sensor/actuator must not be plugged to input/output socket 2 or 4 respectively due to the Y wiring of the inputs/outputs.	Especially designed for food and beverage equipment.
Technical Data		
Protection Class	IP67	
Environmental Temperature	-25°C to +80°C	
Weight	300 g	550 g
Bus System		
AS-Interface Profile	S-7.A.7	
Support A/B Addressing	yes	
System/Sensors Power Supply		
Rated Voltage	AS-Interface net	
Voltage Range	26.5 to 31.6 V DC	
Power Consumption	max. 250 mA	
Input Power Supply		
Voltage Range	24 V DC	17 to 30 V
Sensor Current	10 to 30 V DC	
Indicator	LED green	
Inputs (Type 2 acc. to IEC 61131-2)		
Rated Input Current	24 V DC	
Number of Digital Channels	4	
Channel Type N.O.	p-switching	
Status Indicator	LED green per channel	
Output Power Supply (AUX)		
Rated Voltage	24 V DC	
Voltage Range	10 to 30 V DC	
Reverse Polarity Protection	yes	
Indicator	LED green	
Outputs (Type 2 A acc. to IEC 61131-2)		
Rated Output Current	2 A per channel	
Short Circuit-proof	yes	
Max. Current Carrying Capacity	4 A per module	
Number of Digital Channels	4	
Status Indicator	LED yellow per channel	
Diagnostic Indicator	LED red	
Included in Delivery		
M12 Dust Covers	2 pieces	
Attachable Labels	10 pieces	

Bit Assignment 0910 ASL 146

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	–	–	–	–	1-4	1-3/4	1-2	1-1/2
M12 Output								
Byte 0	–	–	–	–	O-4	O-3/4	O-2	O-1/2

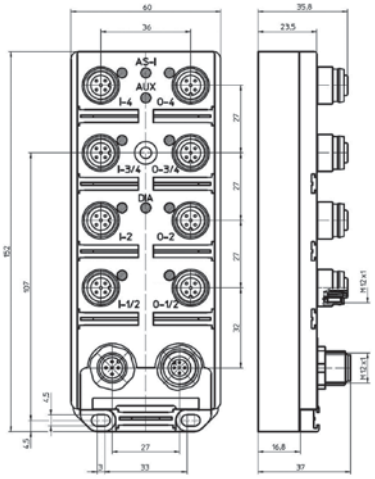
Bit Assignment 0910 ASL 425

Bit	7	6	5	4	3	2	1	0
M12 Input								
Byte 0	–	–	–	–	3	2	1	0
M12 Output								
Byte 0	–	–	–	–	O-4	O-3	O-2	O-1

Diagnostic Indication

LED	Indicator	Condition
I-1..4/O-1..4	Yellow	Channel status
AS-i (only 0910 ASL 425)	Green	AS-Interface power supply active
U-AS-i (only 0910 ASL 146)	Green	AS-Interface power supply active
AUX	Green	Actuator supply active
DIA (only 0910 ASL 425)	Red Red blinking	Communication error/address at 0 Periphery error (actuator short circuit/sensor supply error)
FID (only 0910 ASL 146)	Red Red blinking	Communication error Periphery error (sensor/actuator short circuit)

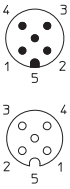
Periphery errors like short circuits or overloads can be sent to the master in the form of a collective diagnosis.
In addition, there is a status LED on the relevant slave.



0910 ASL 146

Pin Assignment 0910 AS 146

AUX



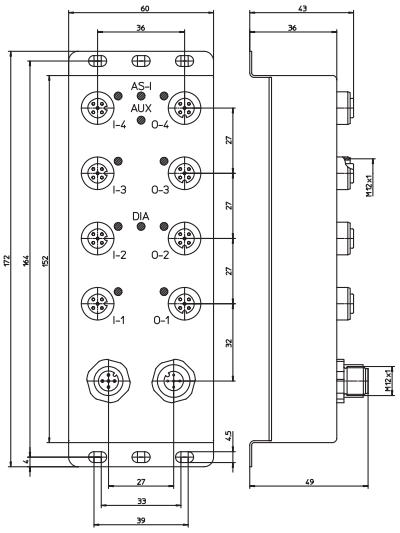
1 = AS-Interface +
2 = Auxiliary power -
3 = AS-Interface -
4 = Auxiliary power +
5 = n.c.

Input M12

Input 1	Input 2	Input 3	Input 4
1 = +24 V	1 = +24 V	1 = +24 V	1 = +24 V
2 = IN 2	2 = n.c.	2 = IN 4	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)
4 = IN 1	4 = IN 2	4 = IN 3	4 = IN 4
5 = Earth	5 = Earth	5 = Earth	5 = Earth

Output M12

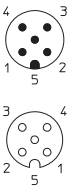
Output 1	Output 2	Output 3	Output 4
1 = n.c.	1 = n.c.	1 = n.c.	1 = n.c.
2 = OUT 2	2 = n.c.	2 = OUT 4	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)
4 = OUT 1	4 = OUT 2	4 = OUT 3	4 = OUT 4
5 = Earth	5 = Earth	5 = Earth	5 = Earth



0910 ASL 425

Pin Assignment 0910 ASL 425

Bus Connection M12



1 = AS-Interface +
2 = 0 V AUX
3 = AS-Interface -
4 = +24 V AUX
5 = Earth

Input M12

Input 1	Input 2	Input 3	Input 4
1 = +24 V	1 = +24 V	1 = +24 V	1 = +24 V
2 = n.c.	2 = n.c.	2 = n.c.	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)
4 = IN 1	4 = IN 2	4 = IN 3	4 = IN 4
5 = Earth	5 = Earth	5 = Earth	5 = Earth

Output M12

Output 1	Output 2	Output 3	Output 4
1 = n.c.	1 = n.c.	1 = n.c.	1 = n.c.
2 = n.c.	2 = n.c.	2 = n.c.	2 = n.c.
3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)	3 = GND (0 V)
4 = OUT 1	4 = OUT 2	4 = OUT 3	4 = OUT 4
5 = Earth	5 = Earth	5 = Earth	5 = Earth