

## LioN-Link Fieldbus Solutions



**The Modular Independent  
Fieldbus I/O System**

LioN-Link: The Open System for  
More Freedom, More Applications,  
and More Industries.





## **Belden® Industrial Solutions – More Convenience and Solutions for Networks in Harsh Environments and Large-scale Infrastructures**

### **Belden Industrial Solutions**

For mission-critical applications, Belden is the signal transmission partner that delivers confidence in signal availability, integrity and performance because only Belden can offer solutions that satisfy any requirement.

A majority of system failures occur within the signal transmission space, and trouble-shooting can be very difficult and time-consuming. We want everyone to "**Be Certain**" that when choosing Belden you receive **Signal Availability** – always there, **Signal Integrity** – always trusted and secure, and **Signal Performance** – always when and where you need it.

Belden has brought together a comprehensive line of industrial cabling, connectivity and networking devices, offering the most reliable communications solutions for your application. Whether you are networking your devices to the controllers, connecting the controllers to the control room, relaying data between the control room, the engineering department, and remote manufacturing sites – or all of the above – Belden has the products you need to seamlessly connect your communications.

From the petrochemical, automotive, pharmaceutical, power generation, pulp and paper, metals, food and beverage, or general manufacturing plant to the corporate headquarters – and everywhere in between – Belden has your signal transmission solution. Belden offers the most dependable network and communications system performance in tough and mission-critical environments.

### **Our Synergy Ensures Continuous Performance**

With the Hirschmann™ and Lumberg Automation™ product line additions to the Belden offering, our line of Complete Industrial Solutions is uniquely positioned to provide the best network and communications infrastructure possible. Belden products and systems expertise means that you can maintain ongoing operations without interruption and costly downtime – in any environment.

Here are a few more good reasons why Belden is your best choice for industrial networking, communications and control:

- We have the expertise to integrate your industrial and commercial networks.
- Our products are engineered to perform in tough and difficult environments.
- We offer the broadest selection of products, for a complete, end-to-end Ethernet solution.
- Our sales and engineering professionals can audit, recommend/design, configure and assemble the products and systems to your specific requirements.
- Our global manufacturing and distribution network make our products available to you globally.

### **Offering Comprehensive Service & Support**

Belden recognizes that comprehensive know-how is necessary to ensure an optimized, homogenous solution. We also know that consultation, support and training requires more than just a general understanding of the products, technologies and market trends. It requires a solid understanding of the application and the ability to provide the type of support that is needed – when and where it is needed. It requires the four key service and support areas that are critical to success:

- Network Design
- Training
- Technical Support
- System Performance

### **Network Design**

Belden eliminates your design challenges because we understand the issues surrounding the design and operation of networks in industrial and mission-critical environments. Our engineers are available to work with you to deliver high-availability networks that meet your enterprise-wide IT needs. Whether it's designing systems for Greenfield facilities, or integrating into existing industrial IT environments, our highly-trained staff lifts the design burden from your shoulders to ours.

We'll consult with you to develop a strategy – or we'll develop and implement your full design – either way our staff is available to you.

### **Training**

Backed by years of meeting and exceeding the needs of a broad range of end-user applications, Belden is ideally suited to offer beginners and networking experts alike the opportunity to expand their understanding of mission-critical industrial networks. Belden has developed a series of training programs that are given by Belden-certified individuals – all experts in industrial networking and cabling.

### **Technical Support**

At Belden, our personnel are poised to assist our customers – ensuring maximum uptime and reliability. And with offices in North America, Asia and Europe, Belden can respond globally.

### **System Performance**

If Belden designs it, we guarantee performance – period. We are committed to ensuring world-class signal connectivity and to significantly improve your operational up-time. All Belden components are "designed" to deliver optimum performance: from connectors, to cable, to routers and switches. Based on this comprehensive product portfolio, we have the necessary industrial solutions DNA to deliver reliability.

For more information on our service and support offering, including our warranties, please go to the Belden web site at [www.belden.com/industrial](http://www.belden.com/industrial) to locate a Belden sales representative near you.





## The Lumberg Automation™ Brand Sets the Standard for Quality, Reliability and Service.



### About Our Solutions

Today, more than ever, manufacturing productivity depends upon seamless data communication and automation systems. Lumberg Automation has assembled one of the most diversified portfolios for industrial connectivity and distributed I/O systems for control applications.

With the advancements in technology and improved machine designs, industrial controls, such as sensors, actuators, safety light curtains, pushbutton switches and the like are moving closer to the application.

### Our Enclosure~less™ Concept

The Enclosure~less concept from Lumberg Automation addresses these applications with an entire suite of industrial hardened connectivity and distributed I/O products.

Enhanced environmental characteristics, modular designs, plug-and-play electronics with quick-disconnect designs are all integrated to increase speed of installation, decrease troubleshooting and maintenance while reducing the overall complexity of the control application. These products provide the optimal solution in machine and equipment design and offer excellent opportunities and benefits to OEMs, system integrators, and end users alike.

### Easing the Design Process

Our system approach leads to decreased time and money to develop complete integrated connectivity solutions. Using our Enclosure~less concept is one of the most effective ways to dramatically reduce the design time.

### Re-Useable Solutions

OEM's now have access to a set of standard products designed around the concept that everything is pluggable and interchangeable.

Having the flexibility to re-configure or expand an existing system without worrying about customization is made possible with our Enclosure~less concept. Most importantly, our products are re-usable and can be adapted to future designs or merely put back on the shelf for future use.

### Improved Installation Time with Less Mistakes

A recent study by a group of European manufacturers concluded that Enclosure~less assembly costs save as much as 30 percent over conventional installation methods.

These savings are realized through not only the Enclosure~less concept, but by the technology that is being employed. With a modular design approach and plug-and-play electronic features, less time will be spent running down errors or replacing parts from incorrect wiring.

### Trouble-Shooting is Simplified

Troubleshooting circuits can be a long process, especially when one is dealing with several hundred termination points.

Many of our products have integrated LED function indicators which provide a visual notification that a circuit is functioning properly.

By using products that have integrated LED functions, mechanics and engineers alike can quickly isolate and resolve the problem.

### Testing Made Simple

OEMs can cost-effectively build and pre-test a machine at their facility, disassemble and transport it to an end user's plant knowing that everything has been tested. This is primarily made possible through the reduction of wiring terminations throughout the system, which makes testing a much simpler and quicker process.

### Reliability is Maximized

Enclosure~less™ solutions can minimize wiring errors because wiring is pre-manufactured with quick-disconnect features. With less manual wiring involved, there are fewer points of failure.

Some studies suggest that a large portion of system failures come from installation rather than part failures. The decrease in errors associated with pre-manufactured wiring leads to an increase in the overall reliability of the control system.

In the end, this helps speed installation and commissioning, maintenance, troubleshooting, and ultimately boosts a plant's production.

### Maintenance/Repair Time is Reduced

Maintenance technicians and operators no longer need to access the control panel since much of the maintenance and troubleshooting can be done outside.

With the simplicity of wiring layout and connections, end users can efficiently isolate problems and replace a starter or I/O locally, rather than sorting through a complex panel. The result is significantly easier troubleshooting and shorter Mean-Time-To-Repair (MTTR).

### Floor Space at a Premium

Control cabinets can occupy a substantial amount of the production floor. The Enclosure~less™ concept dramatically reduces the need for that real estate, allowing companies to leverage more of their facility.

Industries like semiconductor and pharmaceutical manufacturing have realized the benefits of the On-Machine approach for years, as their clean-room space is at a premium.



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Lumberg Automation™ Offers Flexibility In Machine Automation with Connectivity Solutions for Demanding Applications at the Field Level.

## The LioN-Link Standard Brings Flexibility to Machine Design and Automated Fieldbus Systems

### The LioN-Link Decentralized I/O Fieldbus System

The LioN-Link decentralized I/O fieldbus system can create line topologies up to 100 meters in length. The system consists of bus coupler modules, which function as the interface to higher-level fieldbus systems such as **Profibus**, **CANopen**®, **DeviceNet** or **ProfiNet**, and **protocol independent I/O modules**.

### Flexibility in Fieldbus Design

Engineers only need to make minimal changes to the hardware if their end customers use different transmission protocols for the connection of systems to their communications network.

Only the BusHead requires an address setting, the fieldbus independent I/O modules do not require commissioning. Module addressing and terminating resistors are not required in either link line. Both features contribute to protection against manipulation.

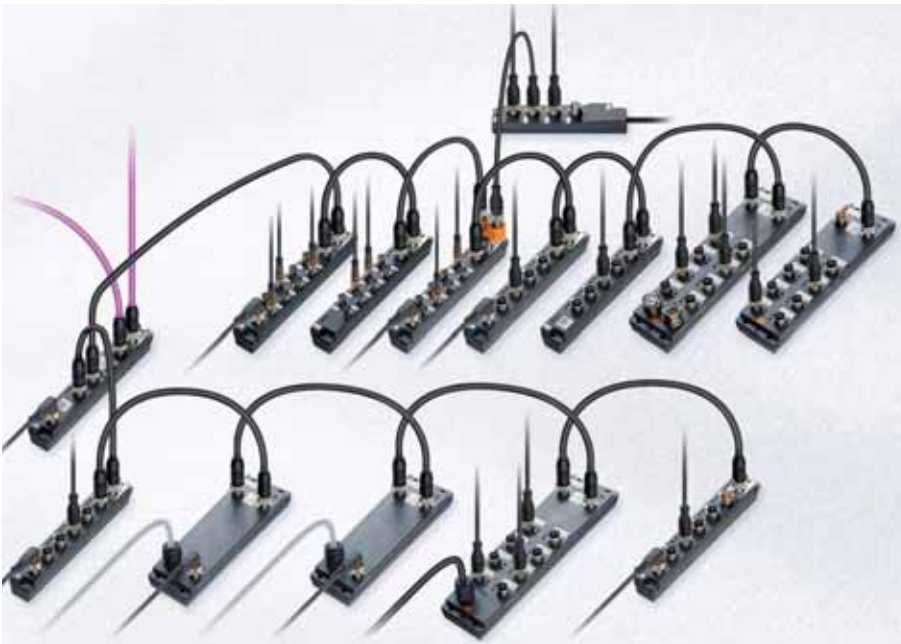
### About the LioN-Link System

The bus coupler and I/O modules, connections use M12 or M8 connectors, are easy to install and commission with plug and play technology. They also offer comprehensive diagnostics options, meet the requirement for **degree of protection IP 67** and have high resistance to vibration and shock – meaning the system is ideal for use in extreme environments.

The LioN-Link I/O fieldbus system not only facilitates secure data communication, but also contributes to the **efficient operation** of machines and systems, however the field wiring may look. With LioN-Link, it is always possible to implement customized solutions. The system offers a high degree of flexibility, which is very useful in the planning phase and during subsequent retrofitting or conversion.

LioN-Link offers a complete range of connection components at the field level. These include:

- Components for the control of electric drives.
- Networking of intelligent sensors and actuators (e.g. proximity switches, motor starters and valves).
- Straight forward retrofitting/conversion of machines, safety applications and decentralized power supplies.





**Close to a Process**

All LioN-Link modules are compliant with the IP 67 protection standard, are vibration, and shock proof and bring the intelligence in machine design and retrofitting closer to the process, making troubleshooting quick and easy. New innovative sealing technology eliminates the need for encapsulating the modules with epoxy – making the modules lightweight and ideal for use in small robotic applications.



**Universal I/O Functionality**

No matter what the final field wiring design may be, a single I/O module provides a whole range of different configurations. Each signal pin is capable of functioning as an input or output – without any additional configuration – providing maximum flexibility when it comes to planning, making changes during commissioning and when retrofitting later.

**Quick, Fast and Easy Installation**

The staggered arrangement of the ports and the optimization of the distance between the ports provide easy installation for molded and field attachable connectors. Rear and lateral mounting holes provide ease of installation and make it possible for installation directly to profile rails.



**Color Coding**

Color-coding of the individual plug-in connection (fieldbus, link, power supply or I/O) ports provide ease of installation and reduces wiring errors.

Color	Function
Purple	PROFIBUS® Connection
Black	CANopen® / DeviceNet Bus Connection
Green	PROFINET®
Orange	LioN-Link Connection
Grey	Power Supply Connection

**Explanation of Product Features**



UL approved

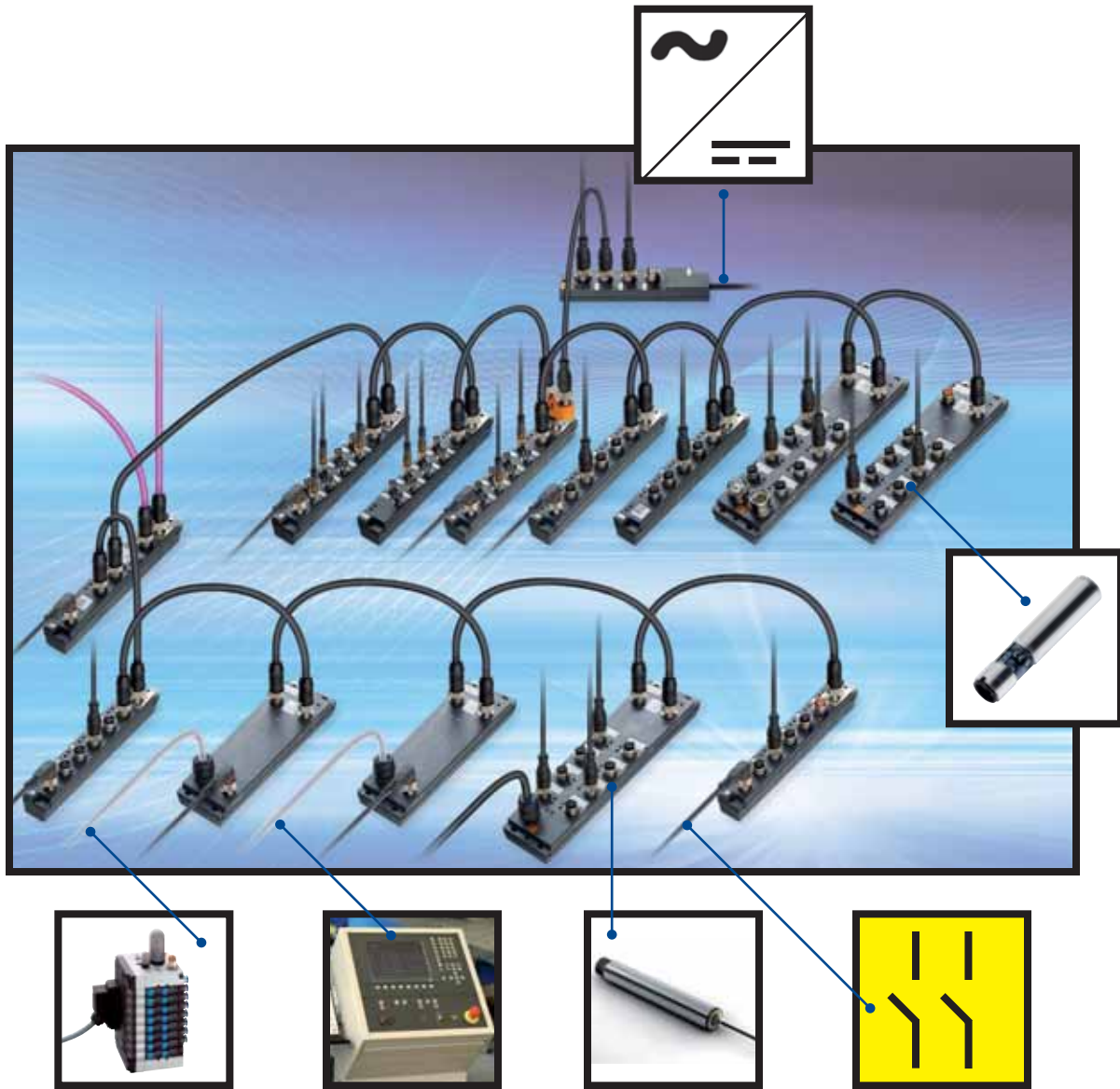


Highly resistant to oils, coolants, lubricants and emulsions.



Highly resistant to vibration and shock.

**LioN-Link Provides Flexibility in Application Design**







### Easy Wiring with Standard Connectors

Combining industry standard Lumberg Automation connectivity components with the LioN-Link system insures uninterrupted procurement and individual part inventory and availability. All of the connectors and cables necessary for the LioN-Link system can be acquired anywhere in the world. The use of standard M12 connectors provides the connection for the fieldbus and link system. Standard M8 and M12 connectors provide the connection for coupling sensors and actuators and standard M12 and 7/8" connectors provide the connection for the power supply.

#### Advantages

- Reduced variety of part types.
- Easy worldwide procurement.

#### Link Wiring With:



CAN / DeviceNet Thin Cables

...or



Standard Actuator/Sensor Cordsets, Single and Double Ended

...or



Field Attachable M12 Connectors

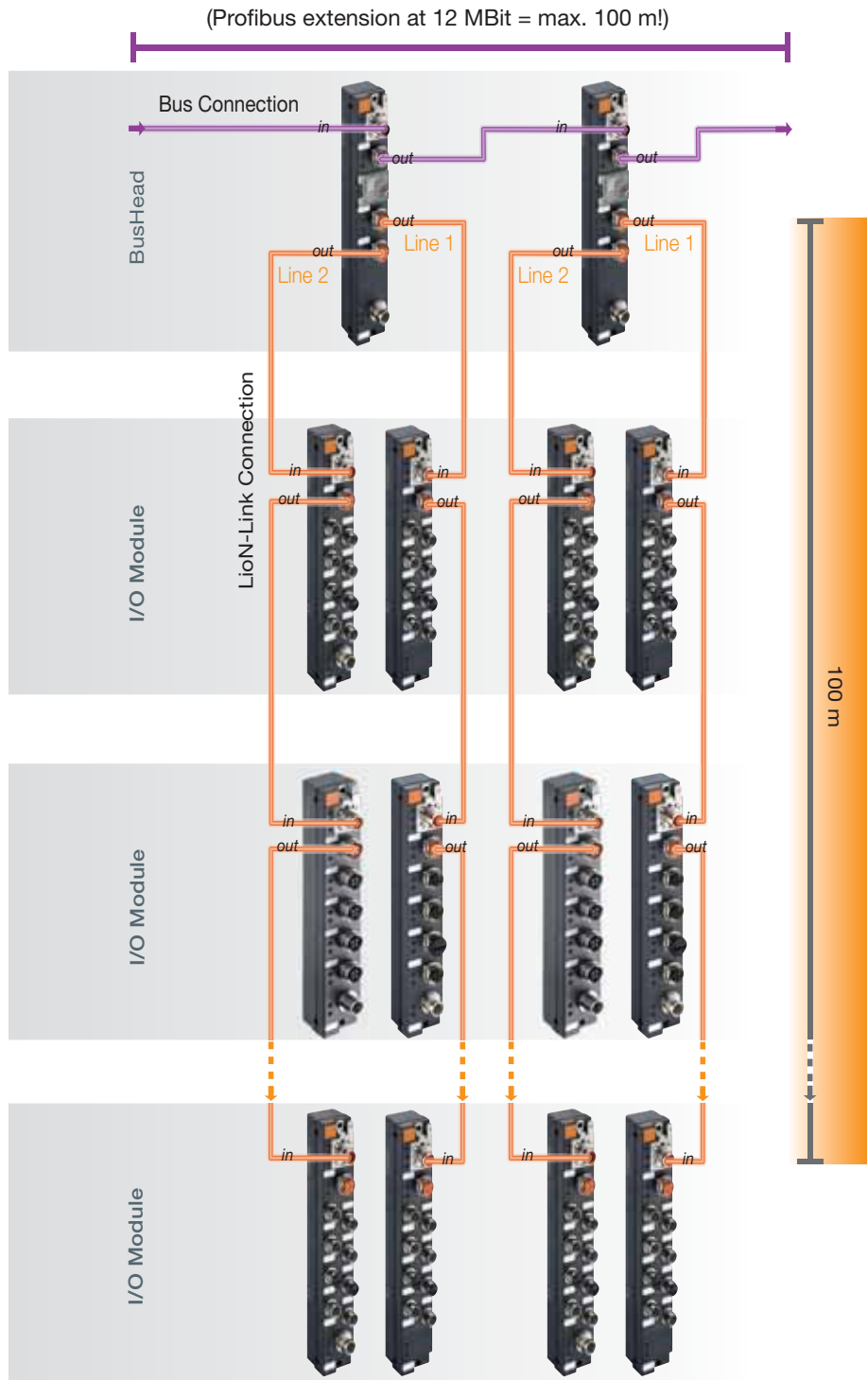


**LioN-Link Wiring is Ideal for Large I/O Expansion**

**Effective Connectivity Solutions with the LioN-Link Power Module**



The LioN-Link 0941 UNC 601/...M power module is used for decentralized power supply for I/O modules. It has four ports, two potential circuits and a 10 m lead with a conductor gauge of 5x1 mm<sup>2</sup>. This provides for bridging distances of up to 25 m without voltage loss as well as for configuring separate potential groups each with their own fuses.



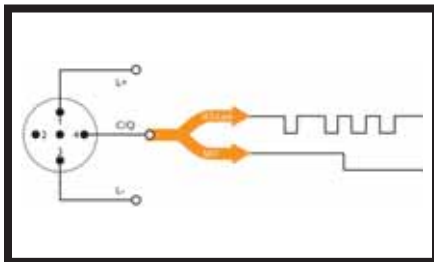


## Effective Connectivity Solutions with LioN-Link Support for I/O-Link: 0940 PSL 602/0940 ESL 601 and 0942 UEM 620

### A Strong Connection with LioN-Link and I/O-Link

From a user perspective, the issue of wiring analog signals in machines and systems has always been problematic due to the use of shielded connection cables. Although the process ability of the various components such as cables and connectors has improved significantly in recent years, the assembly of a shielded cable remains quite an elaborate procedure.

Lumberg Automation offers an effective solution to this problem. With the integration of an I/O-Link interface into the LioN-Link system in conjunction with I/O-Link capable sensors, users can now utilize standard wiring components such as unshielded M12 connection cables.



The 0942 UEM 620 I/O-Link master module provides point-to-point connections for the intelligent sensors and actuators by means of the I/O-Link protocol. The four ports can be configured as digital I/Os or for communications mode.

The module is wired with three conductors, unshielded standard cords that can be up to 20 m in length. The PROFIBUS bus coupler module allows users to connect up to six master modules. In combination with a PROFINET bus coupler module from the LioN-Link family, the I/O-Link master module can also be used in Ethernet networks.

### LioN-Link ProfiNet BusHead

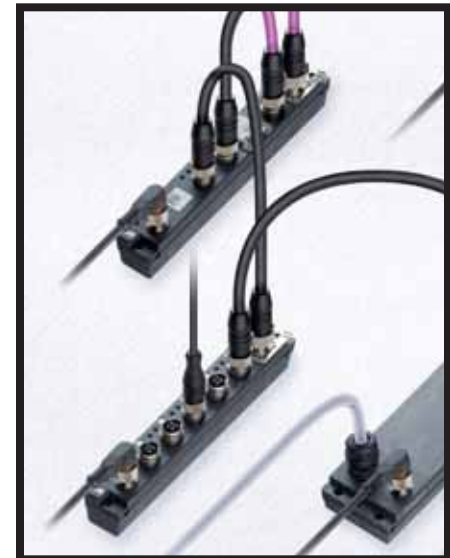
Lumberg Automation has developed a new bus coupler with PROFINET interface for the modular, decentralized LioN-Link system. This bus coupler has an integrated switch, which allows wiring of the PROFINET network in the line structure familiar from PROFIBUS networks.

There is also an integrated web server, which provides access via a standard TCP/IP connection. With this connection, the retrieval of information and the adjustment of settings using a standard web browser are possible. In addition to retrieving device information, it is also possible to set IP addresses directly as well as to display diagnostic data for the connected LioN-Link I/O modules as status information. The integration of a monitoring function facilitates the checking of the sensors and actuators connected to the I/O modules with a graphical representation of the LioN-Link system structure in the web browser.

These useful tools make the system much easier to use, particularly with regard to commissioning, installation and maintenance.

### Effective Connectivity Solutions with LioN-Link. Outputs for Safety Critical Applications with 0942 UEM 612

The 0942 UEM 612 I/O module is suitable for intrinsically safe actuator control or reliable emergency power off functions. It has four digital outputs for increased output current limiting of 2 A per line and a maximum total of 6 A. The module has outputs that are designed for safety critical applications up to Performance Level D of the new machinery directive.



## Effective Connectivity Solutions with Lion-Link Shadow Mode: 0940 PSL 603 and 0942 UEM 620

### Customized Solutions for High Flexibility

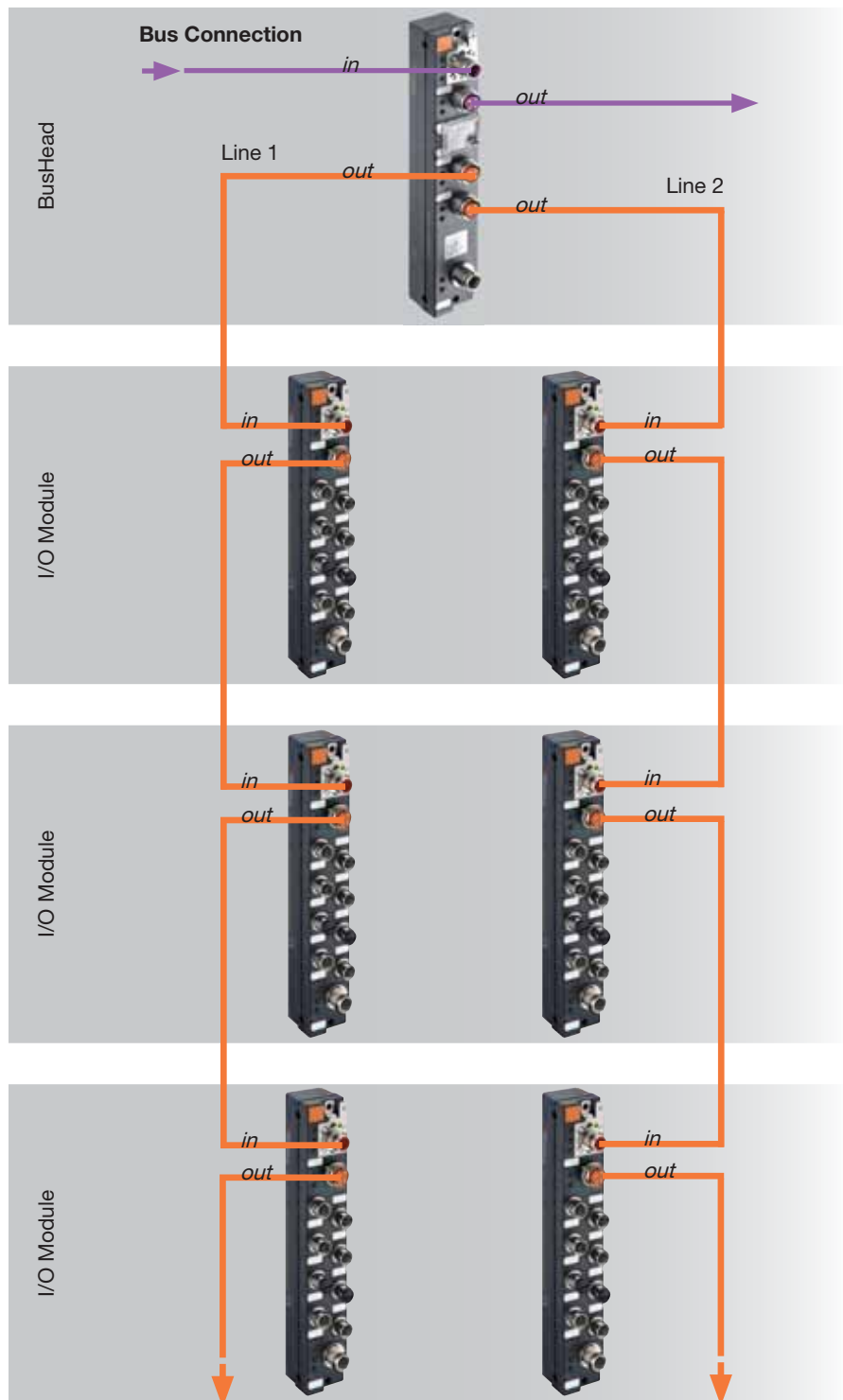
The 0940 PSL 603 bus coupler module permits the integration of up to 30 shadow modules in a Profibus network. Serving as inactive secondary components, these modules each provide eight digital I/O connections.

The bus coupler can be activated by means of a hot plug function without compromising the higher level Profibus communication. In this way, systems can be retrofitted or upgraded when in operation and without the need for additional hardware. The Lumberg Automation shadow module supports the management of dynamically adaptable, but downwards compatible control software over the entire life cycle or plant manufacture cycle.

By retaining the created hardware configuration and control program, it is possible to configure any assembly line individually in accordance with the equipment level. Partial assembly of the sub bus system (due to different equipment levels) does not lead to a bus error. The I/O modules exist logically, but not physically and ignored by the BusHead and no error message is generated. This requires a configuration file, in which the commissioning engineer specifies the available equipment. When control is activated, this configuration is transferred in the form of a binary pattern to the BusHead, which analyzes it for comparison with the original configuration and applies the differences as the status.

If a module then fails during operation, this failure is identified according to the previous Lion-Link standard and signaled as a bus error. Only universal modules of type 0942 UEM 670 (8xM8) are used in the I/O area. The I/O memory area is always reserved for a complete assembly, irrespective of the respective equipment level.

The I/O modules can also be parameterized as dedicated input or output modules, whereby the I/O address space is not affected and is nevertheless reserved (shadow mode).







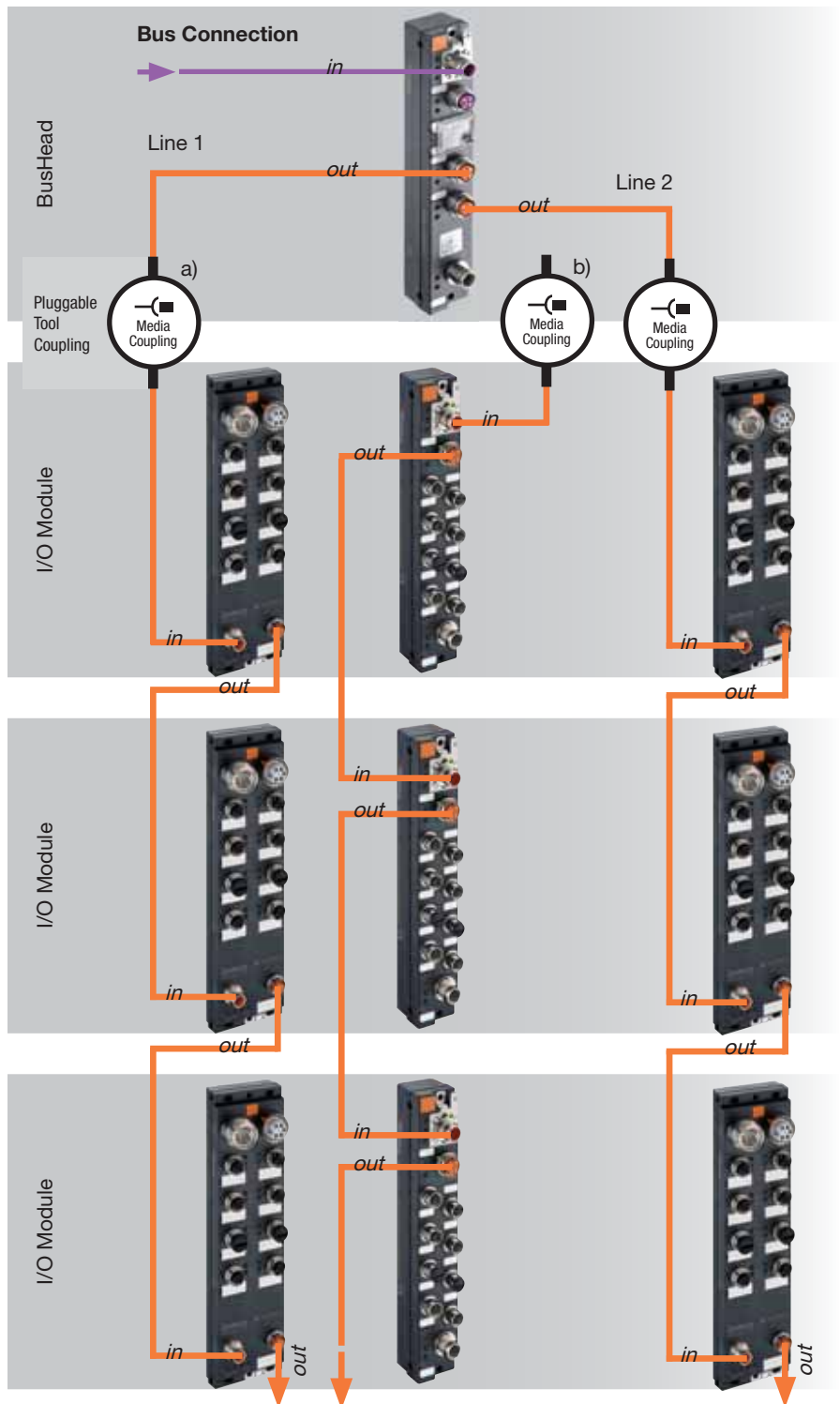
**Effective Connectivity Solutions with LioN-Link  
Tool Changer Mode: 0940 PSL 603**

**The Fast System for Increasing  
Productivity and Efficiency**

With the 0940 PSL 603 bus coupler module, Lumberg Automation has upgraded the LioN-Link product family for other areas of application and provides the options of quick and simple tool change.

The Lumberg Automation LioN-Link system can be connected or disconnected during operating time without affecting the super - imposed Profibus strand. Bus errors are thus avoided. Areas of application in this case are tool couplings on automatic assembly machines or robot systems.

The LioN-Link system from Lumberg Automation saves both time and money and thus a permanent increase in productivity.





## Effective Connectivity Solutions with LioN-Link Motion Drive Control: 0940 PSL 602 and 0942 UEM 620

The use of direct current drives is increasing in many areas of automation technology to accomplish a wide variety of tasks. The advantages are obvious – small, compact, energy efficient drives with a high degree of performance efficiency. From a cost perspective, these drives often represent a good alternative to other solutions. However, integration into a uniform bus concept is often difficult. The components needed for this purpose are not readily available.

A new module in the LioN-Link family from Lumberg Automation – Motion Drive Control, has now filled this gap. This system makes it possible to set up the connection between drives and the various bus systems.

The new module is equipped with four outlets, configured for brushless (EC) motors as well as for brush loaded (DC) motors and all types of digital actuators such as direct current motors or valves. Some of the special features of the LioN-Link Motion module include dynamic rpm control, parameterizable start/ stop ramps for EC motors and an integrated brake resistance for DC motors.

These parameters can also be modified at any time during operation when a suitable control system is utilized. The demand for increased dynamics and maximum possible flexibility has been met as a result. The module also provides eight digital inputs. The wiring complexity is thus minimized for the sensor system allocated.

The good diagnostics capability that is a feature of the entire LioN-Link system is of course included with the Motion Drive Control distribution box. As a result, motor and sensor faults can be diagnosed according to channel, both visually and in the form of software messages. And of course we have also satisfied stringent requirements with respect to the type of protective system and resistance to vibrations and shocks, as is the case with the entire LioN-Link system.

### Key Features

- Networking across multiple segments
- Each conveying zone is divided into segments. Multiple rollers are combined in each segment, i.e. communication with the bus system beyond this segment is possible
- Utilization of standard sensors
- Reduced wiring complexity through the use of connectors
- Only one 24 V network, no AC network and no pneumatic components required
- Energy saving (savings potential can be realized with effective motor control, as the motors are only started when they are needed)
- Dynamic rpm control (acceleration and deceleration) allows soft startup and braking of the rollers
- Comprehensive diagnostics options
- Up to 10,000 motors with one fieldbus master
- LioN-Link: a compact system for I/O and motor control

### Advantages for System Users

- Reduced operating costs, e.g. energy saving or control optimized utilization of rollers
- Minimal investment costs, good price/ performance ratio thanks to an optimum control concept
- Low maintenance costs thanks to standardized components. Rapid replacement through utilization of M8 /M12 connectors

### Advantages for Conveyor Manufacturers

- Activation via Profibus with diagnostic functionality and fault management
- Easy commissioning and installation thanks to minimal wiring complexity with M8/M12 connectors
- Variable motor roller running characteristics with acceleration and deceleration profiles, which can be optimized specifically for the product to be conveyed
- Interface to other fieldbus systems and Ethernet technologies

### Advantages for System Integrators and Machine Builders

- Very good diagnostics capability
- Low servicing costs loss thanks to durability and reliability
- LioN-Link: one system for all inputs and outputs plus motor control and reliability





## Advantages of the LioN-Link System

### Per BusHead:

- 15 devices per line
- 100 m extension per line
- Unlimited distance between two devices up to maximum extension
- Cycle time approx. 2 ms
- No terminators
- Wiring with standard components:
  - Reduced variety of part types and costs
  - Easy purchasing worldwide (manufacturer independent)
- Input modules are supplied using the LioN-Link, no additional connection cable required
- Plug and play commissioning without special utilities
- Diagnostics for periphery faults and bus errors
- Visual differentiation of connections by means of color coding
- Low weight, ideal for small handling robots
- No module addressing and no terminator required
- Universal modules are configuration free
- Supply of safety critical actuators can take place decentrally in the field, no individual wiring
- Expansion of the PROFIBUS network WITHOUT repeaters and retaining the max. baud rate.









## LioN-Link BusHead Profibus-Slave

0940 PSL 601

### Technical Data

#### Environmental

Degree of protection IP 67  
Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 200 g  
Housing material PBT

#### Bus system

ID number 0A36 hex  
GSD file Lum\_0A36.GSD  
Transmission rate max. 12 MBaud  
Address range 1–125 dec  
Rotary address switches 1–99 dec  
Default address 99 dec

#### Profibus DP

#### System/sensors

##### power supply

Rated voltage 24 V DC  
Voltage range 19–30 V DC  
Power consumption typ. 100 mA  
Reverse polarity protection yes  
Indication LED green  
Output current per branch max. 3 A

##### Us1, Us2\*

#### Included in

**delivery/accessories** Dust covers M12, attachable labels

\* Both supply points on the BusHead must always be connected.

### Diagnostic

Diagnosis according to Profibus specification, diagnosis for communication status, module breakdown and periphery faults in the Link system

### Purpose

BusHead for LioN-Link standard modules

#### Part Number

0940 PSL 601



The application of these products in harsh environments should always be checked before use.  
Specifications subject to alteration.



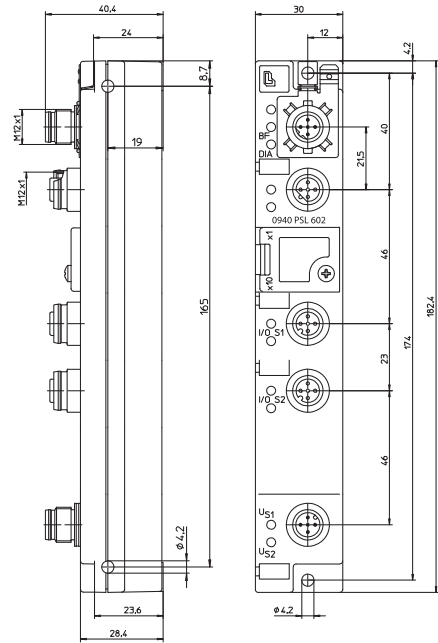
0940 PSL 602



## LioN-Link BusHead Profibus-Slave

LioN-Link BusHead IP 67 bus coupler module for the connection between the higher level fieldbus and the fieldbus independent I/O modules, with M12 bus connection, rotary switches for addressing, M12 LioN-Link connection, M12 power supply connection

- Supports Profibus DP-V1 (acyclic communication) -



### Diagnostic Indication

LED	Indication	Condition
I/O Line 1, I/O Line 2	red green off	wrong configuration /module exchanged online, communication with PLC branch not in use (module not connected)
US1	green	sensor/system power supply Line 1
US2	green	sensor/system power supply Line 2
BF	red	bus error
DIA	red	common indication for periphery faults

### Pin Assignment

Bus connection M12, B coded	LioN-Link connection M12	Power supply M12
<p>1 = +5 V<sup>1</sup> 2 = Line A 3 = GND (0 V)<sup>1</sup> 4 = Line B 5 = Earth</p>	<p>1 = Drain 2 = 24 V System 3 = 0 V System 4 = Data + 5 = Data -</p>	<p>1 = +24 V 2 = +24 V 3 = 0 V 4 = 0 V 5 = Earth</p>

<sup>1</sup> = internal signals



## LioN-Link BusHead Profibus-Slave

0940 PSL 602

### Technical Data

#### Environmental

Degree of protection IP 67  
Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 200 g  
Housing material PBT

#### Bus system

ID number 0B99 hex  
GSD file Lum\_0B99.GSD  
Transmission rate max. 12 MBaud  
Address range 1–125 dec  
Rotary address switches 1–99 dec  
Default address 99 dec

#### Profibus DP

#### System/sensors

##### power supply

Rated voltage 24 V DC  
Voltage range 19–30 V DC  
Power consumption typ. 100 mA  
Reverse polarity protection yes  
Indication LED green  
Output current per branch max. 3 A

##### Us1, Us2\*

#### Included in

**delivery/accessories** Dust covers M12, attachable labels

\* Both supply points on the BusHead must always be connected.

### Diagnostic

Diagnosis according to Profibus specification, diagnosis for communication status, module breakdown and periphery faults in the Link system

### Purpose

BusHead for LioN-Link standard modules, Motion module "0942 UEM 783" and I/O-Link module "0942 UEM 620"

#### Part Number

0940 PSL 602



The application of these products in harsh environments should always be checked before use.  
Specifications subject to alteration.



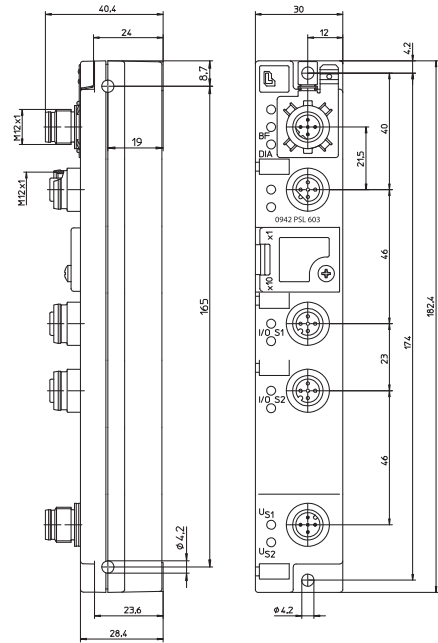
0940 PSL 603



## LioN-Link BusHead Profibus-Slave

LioN-Link BusHead IP 67 bus coupler module for the connection between the higher level fieldbus and the fieldbus independent I/O modules, with M12 bus connection, rotary switches for addressing, M12 LioN-Link connection, M12 power supply connection

– Profibus-Slave, for applications such as tool change or options handling with LioN-Link I/O module 0942 UEM 670 –



### Diagnostic Indication

LED	Indication	Condition
I/O Line 1, I/O Line 2	red green off	wrong configuration /module exchanged online, communication with PLC branch not in use (module not connected)
Us1	green	sensor/system power supply Line 1
Us2	green	sensor/system power supply Line 2
BF	red	bus error
DIA	red	common indication for periphery faults

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## LioN-Link BusHead Profibus-Slave

0940 PSL 603

### Technical Data

#### Environmental

Degree of protection IP 67  
Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 200 g  
Housing material PBT

#### Bus system

ID number OB98 hex  
GSD file Lum\_OB98.GSD  
Transmission rate max. 12 MBaud  
Address range 1–125 dec  
Rotary address switches 1–99 dec  
Default address 99 dec

#### Profibus DP

#### System/sensors

##### power supply

Rated voltage 24 V DC  
Voltage range 19–30 V DC  
Power consumption typ. 100 mA  
Reverse polarity protection yes  
Indication LED green  
Output current per branch max. 3 A

##### Us1, Us2\*

#### Included in

**delivery/accessories** Dust covers M12, attachable labels

\* Both supply points on the BusHead must always be connected.

### Diagnostic

Diagnosis according to Profibus specification, diagnosis for communication status, module breakdown and periphery faults in the Link system

### Purpose

BusHead for LioN-Link standard modules, "shadow module 0942 UEM 670" and "tool change mode"

#### Part Number

0940 PSL 603



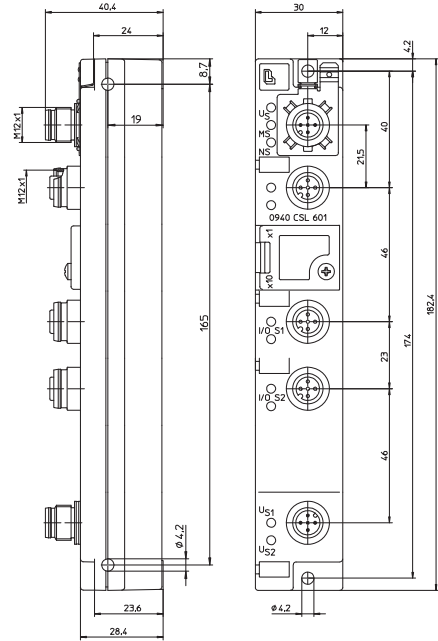
The application of these products in harsh environments should always be checked before use.  
Specifications subject to alteration.

**CANopen**
**LioN-Link BusHead CANopen®-Slave**

0940 CSL 601






LioN-Link BusHead IP 67 bus coupler module for the connection between the higher level fieldbus and the fieldbus independent I/O modules, with M12 bus connection, rotary switches for addressing, M12 LioN-Link connection, M12 power supply connection


**Diagnostic Indication**

LED	Indication	Condition
I/O Line 1, I/O Line 2	red green off	wrong configuration / module exchanged online, communication with PLC branch not in use (module not connected)
Us1	green	sensor/system power supply Line 1
Us2	green	sensor/system power supply Line 2
MS	green green flashing red red flashing red/ green flashing	device is ready for operating wrong configuration unrecoverable fault recoverable fault self test is running
NS	green green flashing red flashing red	online, communication with PLC online, no communication with PLC timeout state of one or more I/O connections failed communication device, BUS-OFF status, duplicate MAC-ID

**Pin Assignment**

Bus connection M12	LioN-Link connection M12	Power supply M12
 <ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = 24 V</li> <li>3 = GND (0 V)</li> <li>4 = CAN_H</li> <li>5 = CAN_L</li> <li>Housing / = Earth</li> </ul>	 <ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = 24 V Sensor/System</li> <li>3 = 0 V Sensor/System</li> <li>4 = Data +</li> <li>5 = Data -</li> </ul>	 <ul style="list-style-type: none"> <li>1 = +24 V</li> <li>2 = +24 V</li> <li>3 = 0 V</li> <li>4 = 0 V</li> <li>5 = Earth</li> </ul>



**LioN-Link BusHead CANopen®-Slave**

0940 CSL 601

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 200 g  
 Housing material PBT

**Bus system**

**CANopen®**  
 GSD/ EDS file 0940CSL601.EDS  
 Transmission rate max. 1 MBaud  
 Address range 1–99 dec  
 Rotary address switches 1–99 dec  
 Default address 63 dec

**Supply of the fieldbus interface**

**Us**  
 Rated voltage 24 V DC  
 Voltage range 11–30 V DC  
 Power consumption typ. 10 mA  
 Reverse polarity protection yes  
 Indication LED green

**System/sensors power supply**

**Us1, Us2\***  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption system: typ. 60 mA /  
 fieldbus: typ. 10 mA  
 Reverse polarity protection yes  
 Indication LED green  
 Output current per branch max. 3 A

**Included in**

**delivery/accessories** Dust covers M12, attachable labels

**Diagnostic**

Diagnosis for communication status, module breakdown and periphery faults in the Link system

**Purpose**

A maximum of 16 LioN-Link I/O modules can be operated on this BusHead

\* Both supply points on the BusHead must always be connected.

**Part Number**

0940 CSL 601



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.

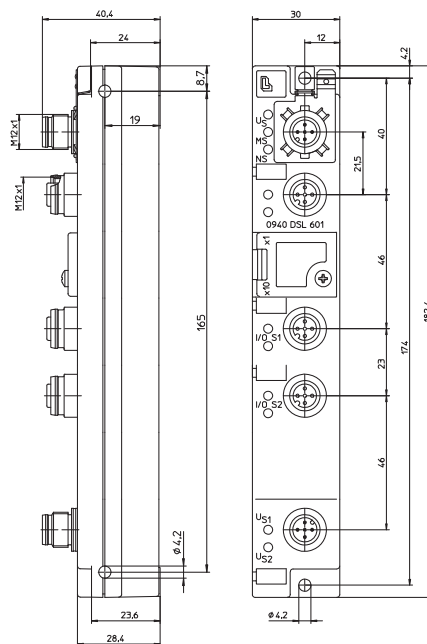


0940 DSL 601



## LioN-Link BusHead DeviceNet-Slave

LioN-Link BusHead IP 67 bus coupler module for the connection between the higher level fieldbus and the fieldbus independent I/O modules, with M12 bus connection, rotary switches for addressing, M12 LioN-Link connection, M12 power supply connection



### Bit Assignment




Bit	7	6	5	4	3	2	1	0
	<b>Input</b>							
<b>Byte 0</b>	0	0	0	0	US1	US2	KS1	KS2
<b>Byte 1</b>	DIAG S <sub>8</sub>	DIAG S <sub>7</sub>	DIAG S <sub>6</sub>	DIAG S <sub>5</sub>	DIAG S <sub>4</sub>	DIAG S <sub>3</sub>	DIAG S <sub>2</sub>	DIAG S <sub>1</sub>
<b>Byte 2</b>	DIAG S <sub>16</sub>	DIAG S <sub>15</sub>	DIAG S <sub>14</sub>	DIAG S <sub>13</sub>	DIAG S <sub>12</sub>	DIAG S <sub>11</sub>	DIAG S <sub>10</sub>	DIAG S <sub>9</sub>
<b>Byte 3</b>	STATUS S <sub>8</sub>	STATUS S <sub>7</sub>	STATUS S <sub>6</sub>	STATUS S <sub>5</sub>	STATUS S <sub>4</sub>	STATUS S <sub>3</sub>	STATUS S <sub>2</sub>	STATUS S <sub>1</sub>
<b>Byte 4</b>	STATUS S <sub>16</sub>	STATUS S <sub>15</sub>	STATUS S <sub>14</sub>	STATUS S <sub>13</sub>	STATUS S <sub>12</sub>	STATUS S <sub>11</sub>	STATUS S <sub>10</sub>	STATUS S <sub>9</sub>

USx: Low voltage Line x  
 KSx: Short circuit on Line x  
 DIAG S<sub>x</sub>: Diagnostic message I/O module x  
 STATUS S<sub>x</sub>: Configuration error I/O module x

### Diagnostic Indication

LED	Indication	Condition
I/O Line 1, I/O Line 2	red green off	wrong configuration / module exchanged online, communication with PLC branch not in use (module not connected)
Us	green	power supply of fieldbus interface
Us1	green	sensor/system power supply Line 1
Us2	green	sensor/system power supply Line 2
MS	green green flashing red red flashing red/green flashing	device is ready for operating wrong configuration unrecoverable fault recoverable fault self test is running
NS	green green flashing red flashing red	online, communication with PLC online, no communication with PLC timeout state of one or more I/O connections failed communication device, BUS-OFF status, duplicate MAC-ID

### Pin Assignment

Bus connection M12	LioN-Link connection M12	Power supply M12
 <p>1 = Drain 2 = 24 V 3 = GND (0 V) 4 = CAN_H 5 = CAN_L Housing / = Earth</p>	 <p>1 = Drain 2 = 24 V Sensor/System 3 = 0 V Sensor/System 4 = Data + 5 = Data -</p>	 <p>1 = +24 V 2 = +24 V 3 = 0 V 4 = 0 V 5 = Earth</p>



**LioN-Link BusHead DeviceNet-Slave**

0940 DSL 601

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 200 g  
 Housing material PBT

**Bus system**

EDS file 00\_0940DSL601.eds  
 Transmission rate max. 500 kBaud  
 Address range 1–63 dec  
 Rotary address switches 1–63 dec  
 Default address 63 dec

**Supply of the fieldbus interface**

Rated voltage 24 V DC  
 Voltage range 11–30 V DC  
 Power consumption typ. 10 mA  
 Reverse polarity protection yes  
 Indication LED green

**System/sensors power supply**

Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 50 mA  
 Reverse polarity protection yes  
 Indication LED green  
 Output current per branch max. 3 A

**Included in**

**delivery/accessories** Dust covers M12, attachable labels

\* Both supply points on the BusHead must always be connected.

**Diagnostic**

Diagnosis for communication status, module breakdown and periphery faults in the Link system

**Purpose**

A maximum of 16 LioN-Link I/O modules can be operated on this BusHead

**Part Number**

0940 DSL 601



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.





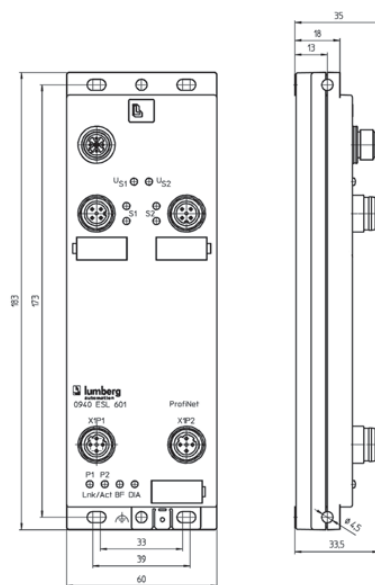
0940 ESL 601



## LioN-Link BusHead ProfiNet-I/O-Device-Slave (ProfiNet LAN)

LioN-Link BusHead IP 67 bus coupler module for the connection between the higher level fieldbus and the fieldbus independent I/O modules, with M12 LioN-Link connection, M12 power supply connection




– M12 LAN connection, D coded, integrated 3-port switch, web server, IRT (Isochrone Real Time communication) –



### Diagnostic Indication

LED	Indication	Condition
I/Os <sub>1</sub>	red green	wrong configuration /module exchanged online, communication with PLC
I/Os <sub>2</sub>	red green off	wrong configuration /module exchanged online, communication with PLC branch not in use
U <sub>S1</sub>	green	sensor/system power supply Line 1
U <sub>S2</sub>	green	sensor/system power supply Line 2
LNK/ACT	green orange (flashing)	connection to an Ethernet device I/O device exchanging data
BF	red	no I / O controller or wrong LioN-Link configuration
DIA	red	common indication for periphery faults

### Pin Assignment

Bus connection M12, D coded	LioN-Link connection M12	Power supply M12
 <p>1 = TD+ 2 = RD+ 3 = TD- 4 = RD Housing = Shield</p>	 <p>1 = Drain 2 = 24 V Sensor/System 3 = 0 V Sensor/System 4 = Data + 5 = Data -</p>	 <p>1 = +24 V 2 = +24 V 3 = 0 V 4 = 0 V 5 = Earth</p>



**LioN-Link BusHead ProfiNet-I/O-Device-Slave (ProfiNet LAN)**

0940 ESL 601

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 800 g  
 Housing material PBT

**Bus system**

**PROFINET IO**

VendorID 0016A hex  
 DeviceID 0302 hex  
 GSDML file GSDML-V2.2-Lumberg Automation-LioN Link-20100408.xml  
 Transmission rate 100 Mbit/s full duplex  
 Transmission method 100Base-TX  
 Default IP address 0

**System/sensors**

**power supply**

**US1, US2\***

Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 100 mA  
 Reverse polarity protection yes  
 Indication LED green  
 Output current per branch max. 3 A  
 Connection M12 plug insert (5 poles), see pin assignment

**Included in**

**delivery/accessories**

Dust covers M12, attachable labels

\* Both supply points on the BusHead must always be connected.

**Purpose**

BusHead for LioN-Link standard modules, Motion module "0942 UEM 783" and I/O-Link module "0942 UEM 620"

**Part Number**

0940 ESL 601



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.

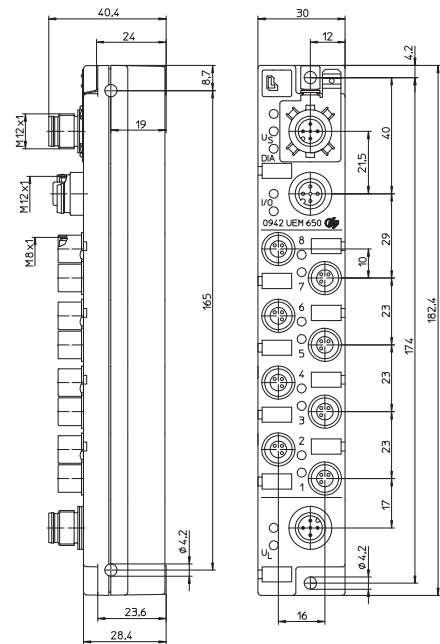
## LioN-Link I/O Module with 8 Digital Inputs and Outputs

0942 UEM 650



### 8 IN / 8 OUT (Universal)

LioN-Link I/O module with 8 digital I/O channels, channels can be used universally as inputs or outputs, M8 sockets (8x), 3 poles, M12 actuator supply






### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M8 Input</b>								
Byte 0	8	7	6	5	4	3	2	1
<b>M8 Output</b>								
Byte 0	8	7	6	5	4	3	2	1

### Diagnostic Indication

LED	Indication	Condition
1...8	yellow	channel status
1...8	red	periphery faults (actuator short circuit/overload)
I/O	red red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
Ul	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

Bus connection M12	Actuator/sensor connection M8	Actuator supply M12
 <p>1 = Drain 2 = 24 V Sensor/System 3 = 0 V Sensor/System 4 = Data + 5 = Data -</p>	 <p>1 = +24 V 3 = 0 V 4 = In /Out</p>	 <p>1 = +24 V 2 = n.c. 3 = GND (0 V) 4 = n.c. 5 = Earth</p>



## LioN-Link I/O Module with 8 Digital Inputs and Outputs

0942 UEM 650

### Technical Data

#### Environmental

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 175 g  
 Housing material PBT

#### System/sensors

**power supply**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 70 mA  
 Operating indication LED green

#### Input power supply

**Us**  
 Voltage range min. (USystem – 1.5 V)  
 Sensor current 700 mA/module  
 Short circuit proof yes  
 Indication LED green

#### Input wiring

**Type 3 acc. to IEC 61131-2**  
 Rated input voltage 24 V DC  
 Channel type N.O. p-switching  
 Number of digital channels max. 8  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

#### Output power supply

**Ul**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Reverse polarity protection yes/antiparallel diode  
 Indication LED green

#### Output wiring

Rated output current 0.5 A per channel  
 Short circuit proof yes  
 Max. output current 4 A per module  
 Overload proof yes  
 Number of digital channels max. 8  
 Channel type N.O. p-switching  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

#### Included in

**delivery/accessories** Dust covers M12, attachable labels

#### Diagnostic

Periphery fault diagnosis for sensor short circuit, actuator short circuit, sensor low voltage detection

### Part Number

0942 UEM 650



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.



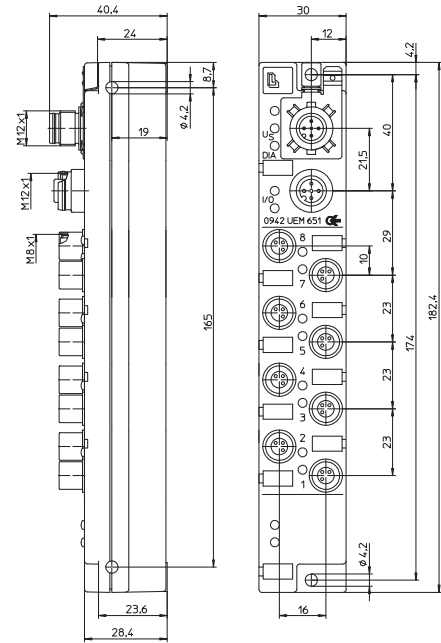
## LioN-Link I/O Module with 8 Digital Inputs

0942 UEM 651



### 8 IN

LioN-Link I/O module with 8 digital inputs to connect standard sensors, M8 sockets (8 x), 3 poles



### Bit Assignment

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

### Diagnostic Indication

LED	Indication	Condition
1...8	yellow	channel status
1...8	red	periphery fault
I/O	red red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
DIA	red	common indication for periphery faults

### Pin Assignment

Bus connection M12	Actuator/sensor connection M8
<p>1 = Drain 2 = 24 V Sensor/System 3 = 0 V Sensor/System 4 = Data + 5 = Data -</p>	<p>1 = +24 V 3 = 0 V 4 = In /Out</p>





## LioN-Link I/O Module with 8 Digital Inputs

0942 UEM 651

### Technical Data

#### Environmental

Degree of protection IP 67  
Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 175 g  
Housing material PBT

#### System/sensors

**power supply** Us  
Rated voltage 24 V DC  
Voltage range 19–30 V DC  
Power consumption typ. 70 mA  
Operating indication LED green

#### Input power supply

**Us**  
Voltage range min. (U<sub>System</sub> – 1.5 V)  
Sensor current 700 mA/module  
Short circuit proof yes  
Indication LED green

#### Input wiring

**Type 3 acc. to IEC 61131-2**  
Rated input voltage 24 V DC  
Channel type N.O. p-switching  
Number of digital channels max. 8  
Channel status indicator LED yellow per channel  
Diagnostic indication LED red per channel

#### Included in

**delivery/accessories** Dust covers M12, attachable labels

### Diagnostic

Periphery fault diagnosis for sensor short circuit, sensor low voltage detection

#### Part Number

0942 UEM 651



The application of these products in harsh environments should always be checked before use.  
Specifications subject to alteration.

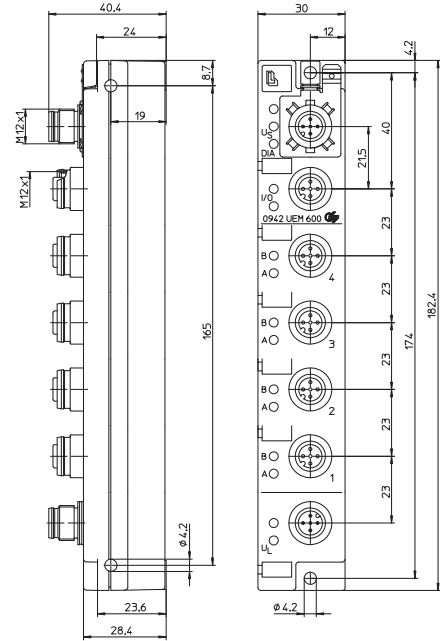
## LioN-Link I/O Module with 8 Digital Inputs and Outputs

0942 UEM 600



### 8 IN / 8 OUT (Universal)

LioN-Link I/O module with 8 digital I/O channels, channels can be used universally as inputs or outputs, M12 sockets (4 x), 5 poles, M12 actuator supply






### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M12 Input</b>								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A
<b>M12 Output</b>								
Byte 0	4B	4A	3B	3A	2B	2A	1B	1A

### Diagnostic Indication

LED	Indication	Condition
1...4 A/B	yellow	channel status
1...4 A/B	red	periphery fault
I/O	red red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
Ul	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

Bus connection M12	Actuator/sensor connection M12	Actuator supply M12
 <ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = 24 V Sensor/System</li> <li>3 = 0 V Sensor/System</li> <li>4 = Data +</li> <li>5 = Data -</li> </ul>	 <ul style="list-style-type: none"> <li>1 = +24 V</li> <li>2 = In /Out B</li> <li>3 = 0 V</li> <li>4 = In / Out A</li> <li>5 = Earth</li> </ul>	 <ul style="list-style-type: none"> <li>1 = +24 V</li> <li>2 = n.c.</li> <li>3 = GND (0 V)</li> <li>4 = n.c.</li> <li>5 = Earth</li> </ul>



**LioN-Link I/O Module with 8 Digital Inputs and Outputs**

0942 UEM 600

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 200 g  
 Housing material PBT

**System/sensors**

**power supply**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 70 mA  
 Operating indication LED green

**Input power supply**

Voltage range min. (U<sub>System</sub> – 1.5 V)  
 Sensor current 700 mA/module  
 Short circuit proof yes  
 Indication LED green

**Input wiring**

Rated input voltage 24 V DC  
 Channel type N.O. p-switching  
 Number of digital channels max. 8  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

**Output power supply**

Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Reverse polarity protection yes/antiparallel diode  
 Indication LED green

**Output wiring**

Rated output current 1.6 A per channel  
 Short circuit proof yes  
 Max. output current 4 A per module  
 Overload proof yes  
 Number of digital channels max. 8  
 Channel type N.O. p-switching  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

**Included in**

**delivery/accessories** Dust covers M12, attachable labels

**Diagnostic**

Periphery fault diagnosis for sensor short circuit, actuator short circuit /channel, sensor low voltage detection

**Part Number**

0942 UEM 600



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.

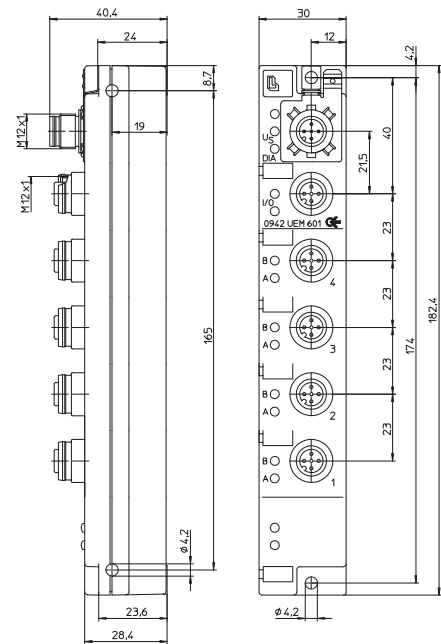
## LioN-Link I/O Module with 8 Digital Inputs

0942 UEM 601



### 8 IN

LioN-Link I/O module with 8 digital inputs to connect standard sensors, M12 sockets (4 x), 5 poles





### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M12 Input</b>								
<b>Byte 0</b>	4B	4A	3B	3A	2B	2A	1B	1A

### Diagnostic Indication

LED	Indication	Condition
1...4 A/B	yellow	channel status
1...4 A/B	red	periphery fault
I/O	red red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
DIA	red	common indication for periphery faults

### Pin Assignment

Bus connection M12	Actuator/sensor connection M12
 <ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = 24 V Sensor/System</li> <li>3 = 0 V Sensor/System</li> <li>4 = Data +</li> <li>5 = Data -</li> </ul>	 <ul style="list-style-type: none"> <li>1 = +24 V</li> <li>2 = In B</li> <li>3 = GND (0 V)</li> <li>4 = In A</li> <li>5 = Earth</li> </ul>



**LioN-Link I/O Module with 8 Digital Inputs**

0942 UEM 601

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 200 g  
 Housing material PBT

**System/sensors**

**power supply** Us  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 70 mA  
 Operating indication LED green

**Input power supply**

**Us**  
 Voltage range min. (U<sub>System</sub> – 1.5 V)  
 Sensor current 700 mA/module  
 Short circuit proof yes  
 Indication LED green

**Input wiring**

**Type 3 acc. to IEC 61131-2**  
 Rated input voltage 24 V DC  
 Channel type N.O. p-switching  
 Number of digital channels max. 8  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

**Included in**

**delivery/accessories** Dust covers M12, attachable labels

**Diagnostic**

Periphery fault diagnosis for sensor short circuit, sensor low voltage detection

**Part Number**

0942 UEM 601



The application of these products in harsh environments should always be checked before use.  
 Specifications subject to alteration.



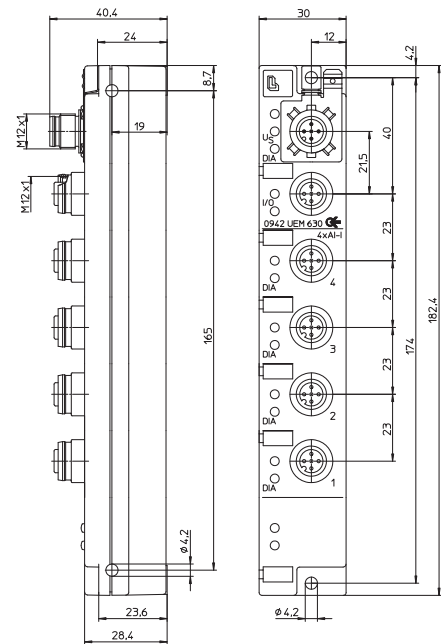
## LioN-Link I/O Module with 4 Analog Inputs

0942 UEM 630



### 4 IN

LioN-Link I/O module with 4 analog inputs  
0(4)-20 mA to connect standard sensors, M12  
sockets (4x), 5 poles





### Bit Assignment

Bit	7	6	5	4	3	2	1	0
	<b>M12 Input</b>							
Byte 0								
Byte 1	Channel 1							
Byte 2								
Byte 3	Channel 2							
Byte 4								
Byte 5	Channel 3							
Byte 6								
Byte 7	Channel 4							

### Diagnostic Indication

LED	Indication	Condition
1...4	yellow	channel status
1...4 DIA	red	periphery fault
I/O	red red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
DIA	red	common indication for periphery faults

### Pin Assignment

Bus connection M12	Sensor connection M12
 <p>1 = Drain 2 = +24 V 3 = GND (0 V) 4 = Data + 5 = Data -</p>	 <p>1 = +24 V 2 = Signal + 3 = GND (0 V) 4 = GND (0 V) 5 = Earth</p>



**LioN-Link I/O Module with 4 Analog Inputs**

0942 UEM 630

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 200 g  
 Housing material PBT

**Input power supply**

**Us**  
 Voltage range 24 V DC  
 Sensor current 700 mA/module  
 Short circuit proof yes  
 Power consumption system: typ. 50 mA

**Input wiring**

Measurement signal (0)4–20 mA  
 Resolution 12 bit + sign  
 Measuring fault (full measuring range) ±1.2%  
 Temperature fault (full measuring range) ±0.01%/K  
 Output formats Siemens S7  
 Input impedance ≤400 Ω  
 Conversion time typ. 25 ms per channel  
 Potential separation channel/channel no  
 Potential separation power/channel no  
 Number of analog channels max. 4  
 Channel status indicator LED yellow: channel active

**Module diagnostic**

Indication Module status Sensor short circuit  
 LED red/green (I/O)

**Channel diagnostic**

0–20 mA Overload at current measurement  
 4–20 mA Overload at current measurement/Underflow/Broken wire  
 Indication LED red (DIA)

**GSD configuration**

Module way Resolution 12 bit, 10 bit (Conversion time ≤3 ms/module)  
 Channel way Measuring range 0–20 mA or 4–20 mA  
 Broken wire (only 4–20 mA), Channel on/off, Diagnostic on /off

**Included in delivery/accessories**

Dust covers M12, attachable labels

**Part Number**

0942 UEM 630



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.

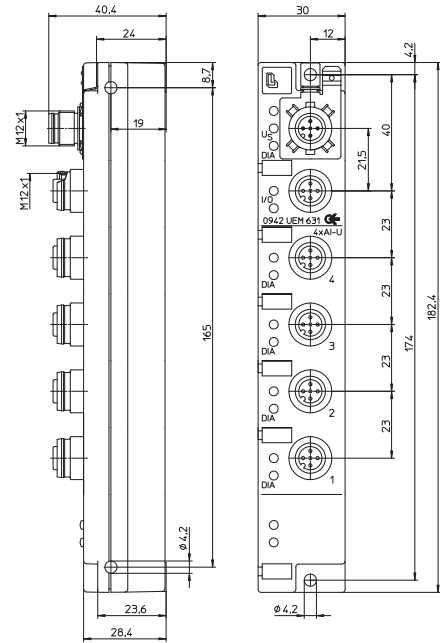
## LioN-Link I/O Module with 4 Analog Inputs

0942 UEM 631



### 4 IN

LioN-Link I/O module with 4 analog inputs 0–10 V to connect standard sensors, M12 sockets (4x), 5 poles





### Bit Assignment

Bit	7	6	5	4	3	2	1	0
	<b>M12 Input</b>							
Byte 0								
Byte 1	Channel 1							
Byte 2								
Byte 3	Channel 2							
Byte 4								
Byte 5	Channel 3							
Byte 6								
Byte 7	Channel 4							

### Diagnostic Indication

LED	Indication	Condition
1...4	yellow	channel status
1...4 DIA	red	periphery fault
I/O	red red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
DIA	red	common indication for periphery faults

### Pin Assignment

Bus connection M12	Sensor connection M12
 <ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = +24 V</li> <li>3 = GND (0 V)</li> <li>4 = Data +</li> <li>5 = Data -</li> </ul>	 <ul style="list-style-type: none"> <li>1 = +24 V</li> <li>2 = Signal +</li> <li>3 = GND (0 V)</li> <li>4 = GND (0 V)</li> <li>5 = Earth</li> </ul>



**LioN-Link I/O Module with 4 Analog Inputs**

0942 UEM 631

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 200 g  
 Housing material PBT

**Input power supply**

**Us**  
 Voltage range 24 V DC  
 Sensor current 700 mA/module  
 Short circuit proof yes  
 Power consumption system: typ. 50 mA

**Input wiring**

Measurement signal 0-10 V  
 Resolution 12 bit + sign  
 Measuring fault (full measuring range) ±1.2%  
 Temperature fault (full measuring range) ±0.01%/K  
 Output formats Siemens S7  
 Input impedance 20 kΩ  
 Conversion time typ. 25 ms per channel  
 Potential separation channel/channel no  
 Potential separation power/channel no  
 Number of analog channels max. 4  
 Channel status indicator LED yellow: channel active

**Module diagnostic**

Indication Module status Sensor short circuit

**Channel diagnostic**

Indication LED red (DIA)

**GSD configuration**

Module way Resolution 12 bit, 10 bit (Conversion time ≤3 ms/module)  
 Channel way Channel on/off, Diagnostic on /off

**Included in**

**delivery/accessories** Dust covers M12, attachable labels

**Part Number**

0942 UEM 631



The application of these products in harsh environments should always be checked before use.  
 Specifications subject to alteration.

0942 UEM 783

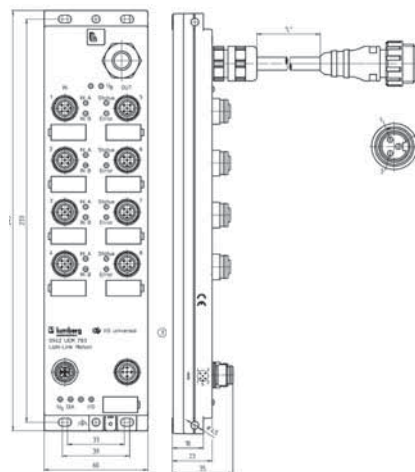


## LioN-Link I/O Module with 8 Digital Inputs and 4 Digital or Analog Outputs (Motion Drive Control)

### 8 IN/4 OUT (digital or analog)

LioN-Link Motion module with 8 digital inputs and 4 universal outputs that can be configured for the connection of brushless motors, DC motors or for valves. System specific specifications such as speed and acceleration/ deceleration can be transmitted via the DP-V1\* protocol. Power supply is supplied via a connecting cable with 7/8" connector.

\* = Only with 0940 PSL 602



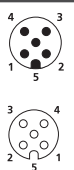
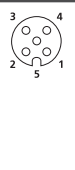

### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M12 Input</b>								
<b>Byte 0</b>	4B	4A	3B	3A	2B	2A	1B	1A
<b>M12 Output</b>								
	Socket 8		Socket 7		Socket 6		Socket 5	
<b>Byte 0</b>	4B	4A	3B	3A	2B	2A	1B	1A

### Diagnostic Indication

LED	Indication	Condition
1...4 A/B	yellow	channel status
1...4 A/B	red	periphery fault
I/O	red red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
Ul	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator/sensor connection M12	Power supply for motors
 <p>1 = Drain 2 = 24 V Sensor/System 3 = 0 V Sensor/System 4 = Data + 5 = Data -</p>	 <p><b>In</b> 1 = +24 V DC 2 = In B 3 = 0 V 4 = In A 5 = Earth</p> <p><b>Out</b> 1 = +24 V DC 2 = Dir 3 = 0 V 4 = Dia 5 = Speed (0-10 V)</p>	 <p><b>Function</b> 1 = Diag. Out 2 = +24 V 3 = 0 V</p> <p><b>Wire color</b> Black Brown Blue</p>



**LioN-Link I/O Module with 8 Digital Inputs and 4 Digital or Analog Outputs (Motion Drive Control)**  
0942 UEM 783

**Technical Data**

**Environmental**

Degree of protection IP 67  
Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 175 g  
Housing material PBT

**System/sensors**

**power supply** **Us**  
Rated voltage 24 V DC  
Voltage range 19–30 V DC  
Power consumption typ. 100 mA  
Reverse polarity protection no  
Operating indication LED green

**Input power supply**

**Us**  
Voltage range 24 V DC  
Sensor current 700 mA/module  
Short circuit proof yes  
Indication LED green  
Connection M12 connector (5 poles), see pin assignment

**Input wiring**

**Type 3 acc. to IEC 61131-2**  
Rated input voltage 24 V DC  
Input current at 24 V DC typ. 5 mA  
Short circuit proof sensor supply yes  
Channel type N.O. p-switching  
Number of digital channels max. 8  
Channel status indicator LED yellow per channel  
Diagnostic indication LED red per channel  
Connection M12 coupling (5 poles), see pin assignment

**Output power supply**

**Ul**  
Rated voltage 24 V DC  
Voltage range 19–27 V DC  
Reverse polarity protection yes/antiparallel diode  
Indication LED green  
Connection 7/8" connector (3 poles), see pin

**Output wiring I**

Rated output current  
Signal status "1"  
Signal status "0"  
Short circuit proof  
Max. output current  
Overload proof  
Number of digital channels  
Channel type N.O.  
Channel status indicator  
Diagnostic indication  
Connection

**Output wiring II**

Voltage range  
Number of channels  
Channel type  
Connection

**Included in delivery/accessories**

assignment

**Type 3 acc. to IEC 61131-2 Output module Pin 2**

1.5 A per channel  
max. 4 A (max. 50 ms)  
max. 1 mA (standard specification)  
yes  
7.2 A per module  
yes  
max. 4  
p-switching  
LED yellow per channel  
LED red per channel  
M12 coupling (5 poles), see pin assignment

**Output module Pin 5**

0–10 V DC (motor dependent)  
max. 4 analog  
PWM output  
M12 coupling (5 poles), see pin assignment

Dust covers M12, attachable labels

**Diagnostic**

Periphery fault diagnosis for sensor short circuit, actuator short circuit /channel, sensor low voltage detection

**Note**

Only to be used in combination with BusHead 0940 PSL 602. Module used to control brushless (EC) motors as well as brush loaded (DC) motors and all types of digital actuators (e.g. valves or direct current motors)

**Part Number**

0942 UEM 783



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.



## LioN-Link I/O Module with 8 Digital Inputs and Outputs (Shadow Mode)

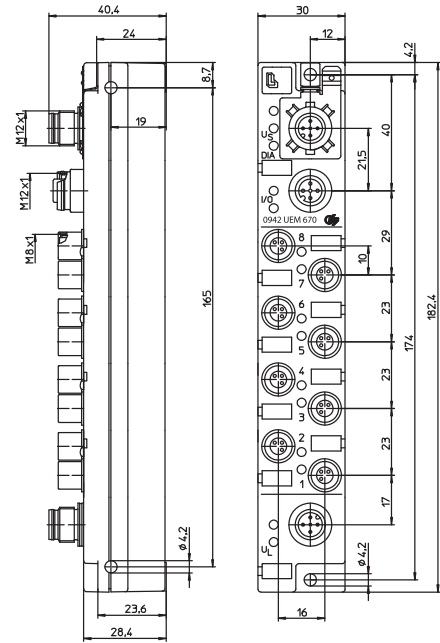
0942 UEM 670



### 8 IN / 8 OUT (Universal)

LioN-Link I/O module with 8 digital I/O channels, channels can be used universally as inputs or outputs, M8 sockets, 3 poles Input or output functionality can be switched off while retaining the respective address range\*.

\* = Only with 0940 PSL 603






### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M8 Input</b>								
Byte 0	8	7	6	5	4	3	2	1
<b>M8 Output</b>								
Byte 0	8	7	6	5	4	3	2	1

### Diagnostic Indication

LED	Indication	Condition
1...8	yellow	channel status
1...8	red	periphery faults (actuator short circuit/overload)
I/O	red red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
Ul	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator/sensor connection M8	Actuator supply M12
 <p>1 = Drain 2 = 24 V Sensor/System 3 = 0 V Sensor/System 4 = Data + 5 = Data -</p>	 <p>1 = +24 V 3 = 0 V 4 = In /Out</p>	 <p>1 = +24 V 2 = n.c. 3 = GND (0 V) 4 = n.c. 5 = Earth</p>



**LioN-Link I/O Module with 8 Digital Inputs and Outputs (Shadow Mode)**

0942 UEM 670

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 175 g  
 Housing material PBT

**System/sensors**

**power supply** **Us**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 70 mA  
 Operating indication LED green

**Input power supply** **Us**

Voltage range 24 V DC  
 Sensor current 700 mA/module  
 Short circuit proof yes  
 Indication LED green

**Input wiring** **Type 3 acc. to IEC 61131-2**

Rated input voltage 24 V DC  
 Channel type N.O. p-switching  
 Number of digital channels max. 8  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

**Output power supply** **Ul**

Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Reverse polarity protection yes/antiparallel diode  
 Indication LED green

**Output wiring**

Rated output current 0.5 A per channel  
 Short circuit proof yes  
 Max. output current 4 A per module  
 Overload proof yes  
 Number of digital channels max. 8  
 Channel type N.O. p-switching  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

**Included in**

**delivery/accessories** Dust covers M12, attachable labels

**Diagnostic**

Periphery fault diagnosis for sensor short circuit, actuator short circuit /channel, sensor low voltage detection

**Note**

This I/O module can only be used with the BusHead 0940 PSL 603. In addition to being used as a dedicated input or output module, this module can also be operated in Shadow Input and Shadow Output mode. The process data in both modes is 1 input and 1 output byte. In Shadow Input mode the input byte is set to 0. The outputs can be activated via the output byte. In Shadow Output mode, however, the outputs cannot be activated and the inputs can be used normally.

**Part Number**

0942 UEM 670



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.

## IO-Link

0942 UEM 620

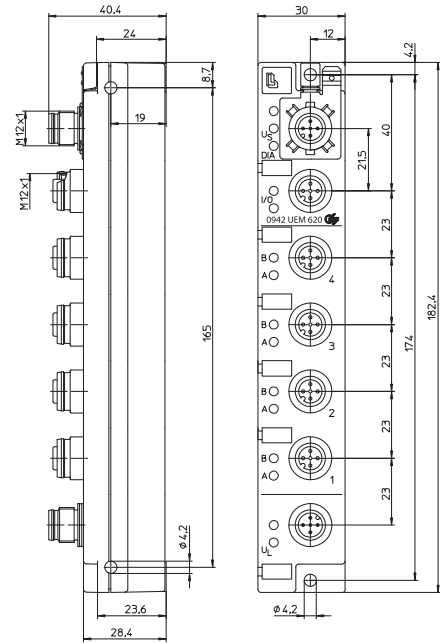


## LioN-Link I/O Module with 8 Digital Inputs and 4 I/O-Link Inputs (I/O-Link-Master)

### 8 IN/4 I/O-Link IN (Universal)

LioN-Link I/O module with 4 I/O-Link channels, each channel can be configured universally in standard digital I/O mode (SIO mode) or in communications mode, M12 sockets, 4 poles

– Only with BusHead 0940 PSL 602 or ProfiNet BusHead 0940 ESL 601 –



### Diagnostic Indication

LED	Indication	Condition
1...4 A   IOL:	green yellow	I/O Link communications mode standard I/O mode (SIO)
1...R B   DIA:	red flashing red	I/O-Link diagnostic: IOL fault SIO mode: periphery fault
I/O	yellow red red flashing green	channel status in SIO mode wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
UL	green	I/O-Link supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator/sensor connection M12	I/O-Link supply M12
<ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = 24 V Sensor/System</li> <li>3 = 0 V Sensor/System</li> <li>4 = Data +</li> <li>5 = Data -</li> </ul>	<ul style="list-style-type: none"> <li>1 = +24 V DC</li> <li>2 = In B</li> <li>3 = (0 V)</li> <li>4 = IO-Data / In A</li> <li>5 = Earth</li> </ul>	<ul style="list-style-type: none"> <li>1 = +24 V</li> <li>2 = n.c.</li> <li>3 = GND (0 V)</li> <li>4 = n.c.</li> <li>5 = Earth</li> </ul>



**LioN-Link I/O Module with 8 Digital Inputs and 4 I/O-Link Inputs (I/O-Link-Master)**

0942 UEM 620

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 175 g  
 Housing material PBT

**System/sensors**

**power supply**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 70 mA  
 Operating indication LED green

**Input power supply**

Voltage range 24 V DC  
 Sensor current 700 mA/module  
 Short circuit proof yes  
 Indication LED green

**Input wiring**

Rated input voltage  
 Channel type N.O.  
 Number of digital channels  
 Channel status indicator  
 Diagnostic indication

**I/O-Link power supply**

Rated voltage  
 Voltage range 1  
 Reverse polarity protection

**I/O-Link**

**Included in delivery/accessories**

**Type 3 acc. to IEC 61131-2**

24 V DC  
 p-switching  
 max. 8  
 LED A green/yellow  
 LED red

**UL**

24 V DC  
 9–30 V DC  
 yes/antiparallel diode

Specification 1.0

Dust covers M12, attachable labels

**Note**

The information in the operating instructions must be observed.

**Bit Assignments**

Channel: 1 byte, 1 word or not configured																																												
Byte	Byte 0								Byte 1																																			
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																												
Port	1								1																																			
Channel: 2 byte, 1 word or not configured																																												
Byte	Byte 2								Byte 3																																			
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																												
Port	2								2																																			
Assignment	I/O-Link-Device process data/High Byte								I/O-Link-Device process data/Low Byte																																			
Channel: 3 byte, 1 word or not configured																																												
Byte	Byte 4								Byte 5																																			
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																												
Port	3								3																																			
Assignment	I/O-Link-Device process data/High Byte								I/O-Link-Device process data/Low Byte																																			
Channel: 4 byte, 1 word or not configured																																												
Byte	Byte 6								Byte 7																																			
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																												
Port	4								4																																			
Assignment	I/O-Link-Device process data/High Byte								I/O-Link-Device process data/Low Byte																																			
2 Bytes (module status)																																												
Byte	Byte 8								Byte 9																																			
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																												
Port	4				3				2				1				4				3				2				1															
Assignment	Pin 4 = DI				Pin 4 = DI				Pin 4 = DI				Pin 4 = DI				1=I/O-Link 0-SIO				1=I/O-Link 0-SIO				1=I/O-Link 0-SIO				1=I/O-Link 0-SIO				Pin 2 = DI				Pin 2 = DI				Pin 2 = DI			

**Part Number**

0942 UEM 670



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.



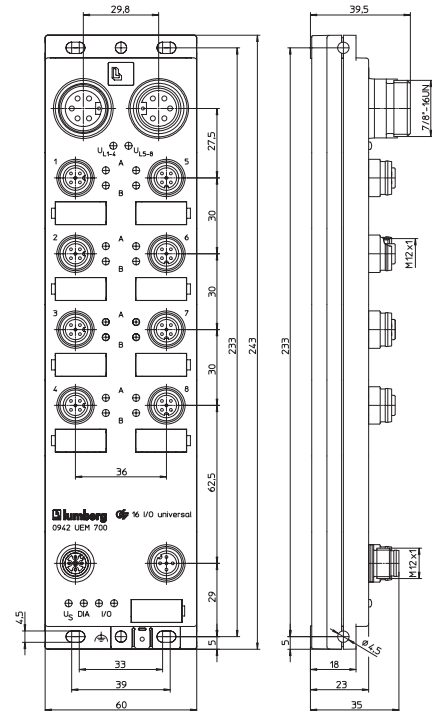
## LioN-Link I/O Module with 16 Digital Inputs and Outputs

0942 UEM 700



### 16 IN/16 OUT (Universal)

LioN-Link I/O module with 16 digital I/O channels, channels can be used universally as inputs or outputs, M12 sockets (8 x), 5 poles, 7/8" actuator supply.



### Bit Assignment

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

### Diagnostic Indication

LED	Indication	Condition
1...8 A/B	yellow	channel status
1...8	red	periphery faults (actuator short circuit/overload)
I/O	red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
UL	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator/sensor connection M12	Actuator supply 7/8"
<p>1 = Drain 2 = 24 V Sensor/System 3 = 0 V Sensor/System 4 = Data + 5 = Data -</p>	<p>1 = +24 V 2 = In /Out B 3 = 0 V 4 = In / Out A 5 = Earth</p>	<p>1 = GND (0 V) 2 = GND (0 V) 3 = Earth 4 = 24 V (UL 1-4) 5 = 24 V (UL 5-8)</p>



## LioN-Link I/O Module with 16 Digital Inputs and Outputs

0942 UEM 700

### Technical Data

#### Environmental

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 375 g  
 Housing material PBT

#### System/sensors

**power supply**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 100 mA

#### Input power supply

**Us**  
 (U<sub>System</sub> – 1.5 V)  
 Sensor current 700 mA  
 Short circuit proof yes  
 Indication LED green

#### Input wiring

**Type 3 acc. to IEC 61131-2**  
 Rated input voltage 24 V DC  
 Channel type N.O. p-switching  
 Number of digital channels max. 16  
 Channel status indicator LED yellow per channel

#### Output power supply

**UL**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Reverse polarity protection yes/antiparallel diode  
 Indication LED green

#### Output wiring

Rated output current 1.6 A per channel  
 Short circuit proof yes  
 Max. output current 9 A (12 A\*) per module

\* Test proven and approved under the following conditions:  
 · Looped through sensor / system power supply max. 2.5 A  
 · Power supply cable STL 204 (5 x1.00 mm<sup>2</sup>)  
 · Operating temperature range max. 40°C

Overload proof yes  
 Number of digital channels max. 16  
 Channel type N.O. p-switching  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

#### Diagnostic

Periphery fault diagnosis for sensor short circuit, actuator short circuit, sensor low voltage detection.

### Part Number

0942 UEM 700



The application of these products in harsh environments should always be checked before use.  
 Specifications subject to alteration.

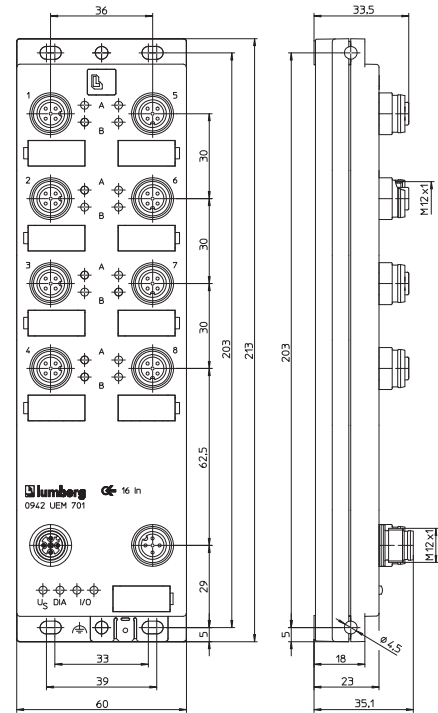
## LioN-Link I/O Module with 16 Digital Inputs

0942 UEM 701



### 16 IN

LioN-Link I/O module with 16 digital inputs to connect standard sensors, M12 sockets (8 x), 5 poles.





### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M12 Input</b>								
<b>Byte 0</b>	4B	4A	3B	3A	2B	2A	1B	1A
<b>Byte 1</b>	8B	8A	7B	7A	6B	6A	5B	5A

### Diagnostic Indication

LED	Indication	Condition
1...8 A/B	yellow	channel status
1...8	red	periphery faults (actuator short circuit/overload)
I/O	red flashing green	wrong configuration / module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator/sensor connection M12
 <ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = 24 V Sensor/System</li> <li>3 = 0 V Sensor/System</li> <li>4 = Data +</li> <li>5 = Data -</li> </ul>	 <ul style="list-style-type: none"> <li>1 = +24 V</li> <li>2 = In /Out B</li> <li>3 = 0 V</li> <li>4 = In / Out A</li> <li>5 = Earth</li> </ul>





## LioN-Link I/O Module with 16 Digital Inputs

0942 UEM 701

### Technical Data

#### Environmental

Degree of protection IP 67  
Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 275 g  
Housing material PBT

#### System/sensors

**power supply** Us  
Rated voltage 24 V DC  
Voltage range 19–30 V DC  
Power consumption typ. 100 mA

#### Input power supply

**Us**  
Voltage range min. (U<sub>System</sub> – 1.5 V)  
Sensor current 700 mA  
Short circuit proof yes  
Indication LED green

#### Input wiring

**Type 3 acc. to IEC 61131-2**  
Rated input voltage 24 V DC  
Channel type N.O. p-switching  
Number of digital channels max. 16  
Channel status indicator LED yellow per channel

### Diagnostic

Periphery fault diagnosis for sensor short circuit, sensor low voltage detection.

#### Part Number

0942 UEM 701



The application of these products in harsh environments should always be checked before use.  
Specifications subject to alteration.

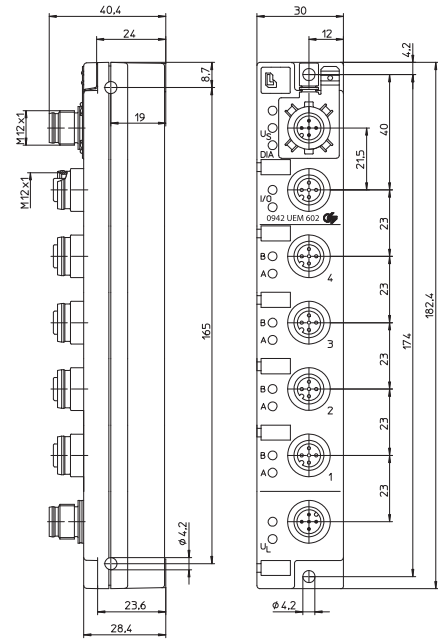
## LioN-Link I/O Module with 4 Digital Outputs

0942 UEM 602



### 4 OUT

LioN-Link I/O module with 4 digital outputs, M12 sockets (4 x), 5 poles, 2 A per channel, one channel per socket.






### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M12 Output</b>								
Byte 0	-	-	-	-	4A	3A	2A	1A

### Diagnostic Indication

LED	Indication	Condition
1...4 A	yellow	channel status
1...4 DIA	red	periphery fault /output active with no actuator supply voltage
I/O	red red flashing green	wrong configuration /module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
Ul	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator connection M12	Actuator supply M12
 <ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = 24 V Sensor/System</li> <li>3 = 0 V Sensor/System</li> <li>4 = Data +</li> <li>5 = Data -</li> </ul>	 <ul style="list-style-type: none"> <li>1 = n.c.</li> <li>2 = n.c.</li> <li>3 = 0 V</li> <li>4 = Out A</li> <li>5 = Earth</li> </ul>	 <ul style="list-style-type: none"> <li>1 = +24 V DC</li> <li>2 = +24 V DC</li> <li>3 = GND 0 V</li> <li>4 = GND 0 V</li> <li>5 = Functional earth</li> </ul>



## LioN-Link I/O Module with 4 Digital Outputs

0942 UEM 602

### Technical Data

#### Environmental

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 200 g  
 Housing material PBT

#### System/sensors

**power supply** **Us**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 70 mA

#### Output power supply

**UL**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Reverse polarity protection yes/antiparallel diode  
 Indication LED green  
 Connection M12 connector (3 or 5 poles)

#### Output wiring

Rated output current 2.0 A per channel  
 Short circuit proof yes  
 Max. output current 4 A (3 pole supply line); 6 A (5 pole supply line)  
 Overload proof yes  
 Number of digital channels max. 4  
 Channel type N.O. p-switching  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

#### Included in

**delivery/accessories** Dust covers M12, attachable labels

### Diagnostic

Periphery fault diagnosis for actuator short circuit /overload per channel.

### Note

Particularly suitable for the control of hydraulic valves.

### Part Number

0942 UEM 602



The application of these products in harsh environments should always be checked before use.  
 Specifications subject to alteration.

## LioN-Link I/O Module with 4 Digital Outputs

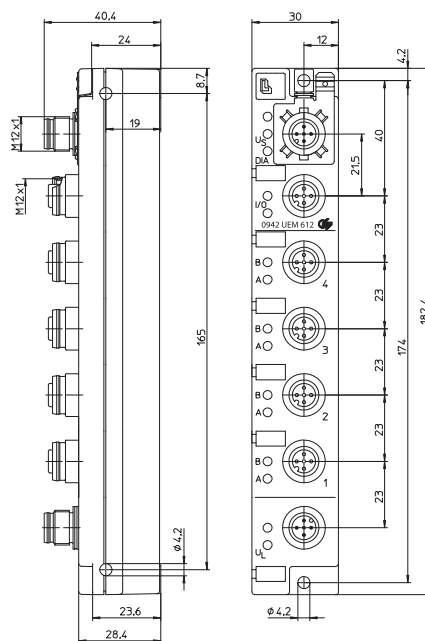
0942 UEM 612



### 4 OUT

LioN-Link I/O module with 4 digital outputs, M12 sockets (4 x), 5 poles, M12 actuator supply, 2 A per channel, one channel per socket

– Suitable for safety critical applications within Performance Levels A through D –






### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M12 Output</b>								
Byte 0	-	-	-	-	4A	3A	2A	1A

### Diagnostic Indication

LED	Indication	Condition
1...4 A	yellow	channel status
1...4 DIA	red	periphery fault /output active with no actuator supply voltage
I/O	red red flashing green	wrong configuration /module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
Ul	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator connection M12	Actuator supply M12
 <p>1 = Drain 2 = 24 V Sensor/System 3 = 0 V Sensor/System 4 = Data + 5 = Data -</p>	 <p>1 = n.c. 2 = n.c. 3 = 0 V 4 = Out A 5 = Earth</p>	 <p>1 = +24 V DC 2 = +24 V DC 3 = GND 0 V 4 = GND 0 V 5 = Functional earth</p>



## LioN-Link I/O Module with 4 Digital Outputs

0942 UEM 612

### Technical Data

#### Environmental

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 200 g  
 Housing material PBT

#### System/sensors

**power supply** **Us**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption typ. 70 mA  
 Operating indication LED green

#### Output power supply

**UL**  
 Rated voltage 24 V DC  
 Voltage range 19–28.8 V DC (SELV/PELV acc. to EN60950-1)  
 Reverse polarity protection yes/antiparallel diode, external fuse with 4/6 A medium time lag mandatory  
 Indication LED green  
 Connection M12 connector (3 or 5 poles)

#### Output wiring

Rated output current 2.0 A per channel  
 Short circuit proof yes  
 Max. output current 4 A (3 pole supply line); 6 A (5 pole supply line)  
 Overload proof yes  
 Number of digital channels max. 4  
 Channel type N.O. p-switching  
 Channel status indicator LED yellow per channel  
 Diagnostic indication LED red per channel

#### Included in

**delivery/accessories** Dust covers M12, attachable labels

### Diagnostic

Periphery fault diagnosis for actuator short circuit /overload per channel.

### Note

Due to the need to guarantee reliable, all pole disconnection of the output voltage supply on the customer side, utilization in emergency power off circuits is possible for applications up to Performance Level D. The absence of reaction between the logic and output supply circuits in the event of a hardware fault in the module is guaranteed.

The instructions in the LioN-Link manual must be observed in this case.

## Part Number

0942 UEM 612



The application of these products in harsh environments should always be checked before use. Specifications subject to alteration.

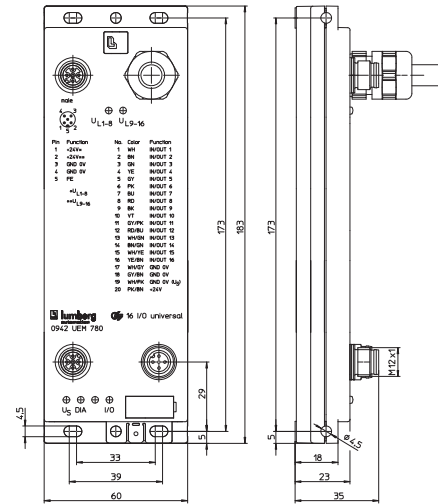
## LioN-Link I/O Module with 16 Digital Inputs and Outputs

0942 UEM 780



### 16 IN/16 OUT (Universal)

LioN-Link I/O module with 16 digital I/O channels, channels can be used universally as inputs or outputs, multipole cable interface to connect valve terminals, control consoles, manual tool changing devices, IP20 terminal boxes.



### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M12 Input</b>								
Byte 0	RD	BU	PK	GY	YE	GN	BN	WH
Byte 1	YE/BN	WH/YE	BN/GN	WH/GN	RD/BU	GY/PK	VT	BK
<b>M12 Output</b>								
Byte 0	RD	BU	PK	GY	YE	GN	BN	WH
Byte 1	YE/BN	WH/YE	BN/GN	WH/GN	RD/BU	GY/PK	VT	BK

### Diagnostic Indication

LED	Indication	Condition
I/O	red red flashing green	wrong configuration /module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
Ul	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator connection M12
<ul style="list-style-type: none"> <li>1 = Drain</li> <li>2 = 24 V Sensor/System</li> <li>3 = 0 V Sensor/System</li> <li>4 = Data +</li> <li>5 = Data -</li> </ul>	<ul style="list-style-type: none"> <li>1 = +24 V (Ul 1-8)</li> <li>2 = +24 V (Ul 9-16)</li> <li>3 = GND (0 V)</li> <li>4 = GND (0 V)</li> <li>5 = Earth</li> </ul>



## LioN-Link I/O Module with 16 Digital Inputs and Outputs

0942 UEM 780

### Technical Data

#### Environmental

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

#### Mechanical

Weight 800 g (with 5 m cable)  
 Housing material PBT

#### System/sensors

**power supply** **Us**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption 140 mA

#### Input power supply

**Us**  
 Voltage range min. (U<sub>System</sub> – 1.5 V)  
 Sensor current 700 mA  
 Short circuit proof yes  
 Indication LED green

#### Input wiring

**Type 3 acc. to IEC 61131-2**  
 Rated input voltage 24 V DC  
 Channel type N.O. p-switching  
 Number of digital channels max. 16

#### Output power supply

**UL**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Reverse polarity protection yes/antiparallel diode  
 Indication LED green

#### Output wiring

Rated output current 0.5 A per channel  
 Short circuit proof yes  
 Max. output current 6 A (3 A per group)  
 Group 1 Channel 1–8  
 Group 2 Channel 9–16  
 Overload proof yes  
 Number of digital channels max. 16  
 Channel type N.O. p-switching

### Diagnostic

Periphery fault diagnosis for sensor short circuit, actuator short circuit, sensor low voltage detection.

### Part Number

0942 UEM 780/5 M



The application of these products in harsh environments should always be checked before use.  
 Specifications subject to alteration.



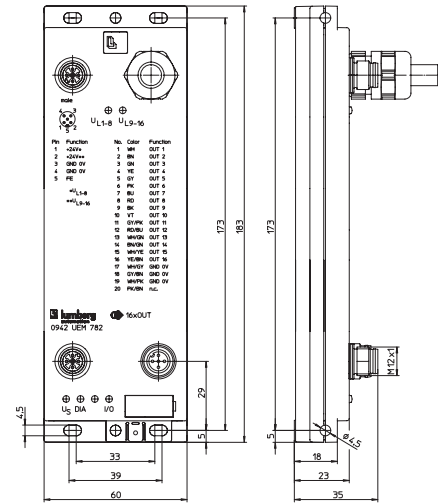
## LioN-Link I/O Module with 16 Digital Outputs

0942 UEM 782



### 16 OUT

LioN-Link I/O module with 16 digital outputs, multipole cable interface to connect valve terminals, manual tool changing devices, IP20 terminal boxes.



### Bit Assignment

Bit	7	6	5	4	3	2	1	0
<b>M12 Output</b>								
<b>Byte 0</b>	RD	BU	PK	GY	YE	GN	BN	WH
<b>Byte 1</b>	YE/BN	WH/YE	BN/GN	WH/GN	RD/BU	GY/PK	VT	BK

### Diagnostic Indication

LED	Indication	Condition
I/O	red red flashing green	wrong configuration /module exchanged not recognized by the BusHead online, communication with BusHead
Us	green	sensor/system power supply
Ul	green	actuator power supply
DIA	red	common indication for periphery faults

### Pin Assignment

LioN-Link connection M12	Actuator connection M12



**LioN-Link I/O Module with 16 Digital Outputs**

0942 UEM 782

**Technical Data**

**Environmental**

Degree of protection IP 67  
 Operating temperature range -10°C (+14°F) to +60°C (+140°F)

**Mechanical**

Weight 320 g (with 1 m cable)  
 Housing material PBT

**System/sensors**

**power supply** **Us**  
 Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Power consumption 40 mA

**Output power supply** **UL**

Rated voltage 24 V DC  
 Voltage range 19–30 V DC  
 Reverse polarity protection yes/antiparallel diode  
 Indication LED green

**Output wiring**

Rated output current 0.5 A per channel  
 Short circuit proof yes  
 Max. output current 6 A (3 A per group)  
 Group 1 Channel 1–8  
 Group 2 Channel 9–16  
 Overload proof yes  
 Number of digital channels max. 16  
 Channel type N.O. p-switching

**Diagnostic**

Periphery fault diagnosis for actuator short circuit.

**Part Number**

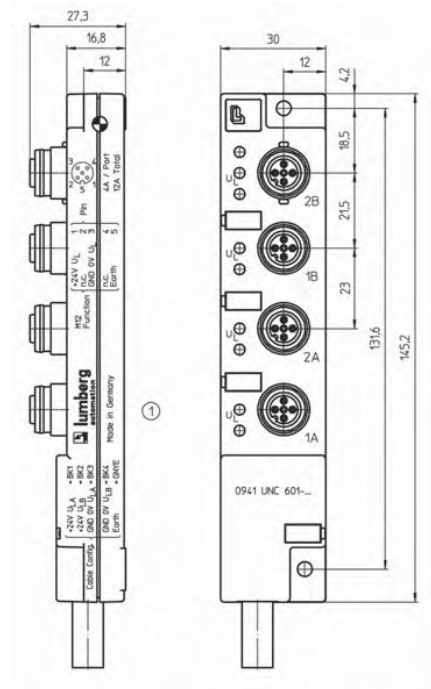
0942 UEM 782/1 M



The application of these products in harsh environments should always be checked before use.  
 Specifications subject to alteration.

### Power Distributor with 4 M12 Sockets

**0941 UNC 601**

 LioN-Link power distributor, 4x M12 ports, 2 potential circuits, 10 m lead with 5x1 mm<sup>2</sup>.


#### Pin Assignment

##### Power supply 1A- & 2A-M12



- 1 = 24 V U<sub>LA</sub>
- 2 = n.c.
- 3 = GND 0V U<sub>LA</sub>
- 4 = n.c.
- 5 = Earth

##### 1B- & 2B-M12



- 1 = 24 V U<sub>LB</sub>
- 2 = n.c.
- 3 = GND 0V U<sub>LB</sub>
- 4 = n.c.
- 5 = Earth

##### Cable assignment

Function	Wire color
+24 V U <sub>LA</sub>	black 1
+24 V U <sub>LB</sub>	black 2
GND 0 V U <sub>LA</sub>	black 3
GND 0 V U <sub>LB</sub>	black 4
Earth	green/ yellow



## Power Distributor with 4 M12 Sockets

0941 UNC 601

### Technical Data

#### Environmental

Degree of protection IP 67  
Operating temperature range -25°C (-13°F) to +70°C (+158°F)

#### Mechanical

Housing PBT  
Contact holder PA  
Contact M12 CuSn, pre-nickel and 0.3 µm gold plated  
Threaded bush CuZn, nickel plated  
O-ring FKM

#### Electrical data

Rated current at 40°C 4 A / port, 12 A / module  
Rated voltage 10–30V  
Operating indication LED green  
Insulation resistance >10<sup>9</sup> Ω  
Degree of contamination 3

#### Included in

**delivery/accessories** Dust covers M12, attachable labels

### Part Number

0941 UNC 601/10M










The application of these products in harsh environments should always be checked before use.  
Specifications subject to alteration.

**BusHead Wiring Accesories**

0940 PSL 601

0940 CSL 601



Bus Connection, 5 Poles	Designation	Description
	0975 254 10...	Profibus signal cable, M12, B coded
	0935 253 10...	CAN/ DeviceNet signal cable, Thin Cable, M12
	0979 PTX 101	Profibus terminating resistor, M12, B coded
	0939 CTX 101	CAN/DeviceNet terminating resistor, M12
LioN-Link Connection, 5 Poles	Designation	Description
	0935 253 10...	CAN/ DeviceNet signal cable, Thin Cable, M12
	RST 5...	Actuator /sensor cordset, M12 male connector with molded cable
	RK(W)T 5...	Actuator /sensor cordset, M12 female/ female right angle connector with molded cable
	RST 5-RKT 5...	Actuator /sensor cordset, M12 male and female connector
	RSC(W) 5/9	Field attachable connector , M12 male/male right angle connector or M12 female/ female right angle connector, with threaded joint
	RSC(W) 5/9	
Power Supply Connection, 5 Poles	Designation	Description
	RKT 5...	Actuator /sensor cordset, M12 female/ female right angle connector with molded cable
	RKWT 5...	
	0906 UTP 101	T-connector with M12 male/female connector, 5 poles



**I/O Module Wiring Accesories**

LioN-Link Connection, 5 Poles	Designation	Description
	0935 253 10...	CAN/ DeviceNet signal cable, Thin Cable, M12
	RST 5...	Actuator /sensor cordset, M12 male connector with molded cable
	RK(W)T 5...	Actuator /sensor cordset, M12 female/ female right angle connector with molded cable
	RST 5-RKT 5...	Actuator /sensor cordset, M12 male and female connector
	RSC(W) 5/9 RSC(W) 5/9	Field attachable connector , M12 male/male right angle connector or M12 female/ female right angle connector, with threaded joint
	0906 UTP 104	T-connector/ splitter, 2-way, with mounting hole, M12 female connector with two M12 male connectors, 5-poles
Actuator/Sensor Connection, 3 & 5 Poles	Designation	Description
	RSMV...	Actuator /sensor cordset, M8 male connector with molded cable
	RSMC... RSMCW...	Field attachable connector, M8 male/ male right angle connector, with threaded joint
	RST...	Actuator /sensor cordset, M12 male connector with molded cable
	RSMV-RKM(W)... RST-RKM...	Actuator /sensor cordset, M8/M12 male connector and M8/M12 female/female right angle connector
	RSC(W) 5/9 RSC(W) 5/9	Field attachable connector , M12 male/ male right angle connector or M12 female/ female right angle connector, with threaded joint
Power Supply Connection, 5 Poles	Designation	Description
	RKT 5...	Actuator /sensor cordset, M12 female/ female right angle connector with molded cable
	RKWT 5...	
	0906 UTP 101	T-connector with M12 male/female connector, 5 poles





## I/O Module Wiring Accesories

0942 UEM 78...

0942 UEM 70...



Power Supply Connection, 5 Poles	Designation	Description
----------------------------------	-------------	-------------

	RKT 5... RKWT 5...	Actuator /sensor cordset, M12 female/ female right angle connector with molded cable
--	-----------------------	--

	0905 204 3...	Power supply double, 7/ 8", single or double ended, straight or angular
--	---------------	--

	RKC(W) 5... RKC 50...	Field attachable connector, M12/ 7/8" female/ female right angle connector with threaded joint
--	--------------------------	--

Actuator/Sensor Connection, 5 Poles	Designation	Description
-------------------------------------	-------------	-------------

	RST...	Actuator /sensor cordset, M12 male connector with molded cable
--	--------	---

	RST-RKM...	Actuator /sensor cordset, M12 male connector and M8/M12 female connector
--	------------	---

	RSC... RSCW...	Field attachable connector , M12 male/male right angle connector, with threaded joint
--	-------------------	--

LioN-Link Connection, 5 Poles	Designation	Description
-------------------------------	-------------	-------------

	0935 253 10...	CAN/ DeviceNet signal cable, Thin Cable, M12
--	----------------	--

	RST 5...	Actuator /sensor cordset, M12 male connector with molded cable
--	----------	---

	RK(W)T 5...	Actuator /sensor cordset, M12 female/ female right angle connector with molded cable
--	-------------	---

	RST 5-RKT 5...	Actuator /sensor cordset, M12 male and female connector
--	----------------	--

	RSC(W) 5/9 RSC(W) 5/9	Field attachable connector , M12 male/male right angle connector or M12 female/ female right angle connector, with threaded joint
--	--------------------------	---





### LioN-Link Configurator for Intermediate Supply

A free calculation program is available to assist in designing a LioN-Link network. Planning the necessary intermediate supplies accurately and selecting the optimum location within the network is a critical step in the network design process.

**Ausdehnung des LioN-Link-Systems in Abhängigkeit vom Spannungsabfall sowie von der Strombelastbarkeit der Steuerleitungen**

Startwerte: Engangsspannung U<sub>in</sub> 24,0 V, U<sub>em</sub> für UEM 19,5 V, I<sub>max</sub> für Bushead 3,0 A, I<sub>max</sub> für Link-Module 3,0 A, U<sub>em</sub> max (berechnet) 4,5 V, U<sub>em</sub> max (man. Vorgabe) 3,0 V, empf. Abschleifung

Testversion: 2.15  
Achtung: Zwischenempfangung abhängig von STL-Typ u. d. Strombelastung

Leitungslänge in Link-Zweig in Meter: 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115

Systemaufbau	Zwischenempfangung	Eingangsspannung U in [V]	Modultyp STL-Typ	Leitungslänge in [m]	Kanal-Stromaufnahme										Modulstromaufnahme in [A]	Summenstrom (max. 3,5 A) in [A]	Spannungsfall in [V]	Spannungsfall in [%] bezogen auf Eingangsspannung Buskopf	Spannungsfall in [%] bezogen auf vorhergehende Modulspannung
					D17	D16	D15	D14	D13	D12	D11	D10	D9	D8					
Buskopf		24,00	0940 PSL 601: Profibus																
Link Leitung 1			STL 233	20											0,47	0,99	4,11	4,11	
Modul 1	<input type="checkbox"/> Zwischenempfangung	23,01	0942 UEM 600: 4xM12 / 8p		0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,47					
Link Leitung 2			STL 233												0,00	0,00	0,00	0,00	
Modul 2	<input type="checkbox"/> Zwischenempfangung	23,01	kein											0					
Link Leitung 3			STL 233												0,00	0,00	0,00	0,00	
Modul 3	<input type="checkbox"/> Zwischenempfangung	23,01	kein											0					
Link Leitung 4			STL 233												0,00	0,00	0,00	0,00	
Modul 4	<input type="checkbox"/> Zwischenempfangung	23,01	kein											0					
Link Leitung 5			STL 233												0,00	0,00	0,00	0,00	
Modul 5	<input type="checkbox"/> Zwischenempfangung	23,01	kein											0					

The table takes the following conditions into account:

Calculation of the voltage drop (in volts and percent) for each cable section between the designed Link modules of a Link branch, taking into account

- the Link cable length
- the Link cable cross section
- the Link module type
- the channel current load
- the module resultant current
- the total resultant current
- the Link connector M12

The program and instructions are available from the download portal at [www.beldensolutions.com](http://www.beldensolutions.com)

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