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

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

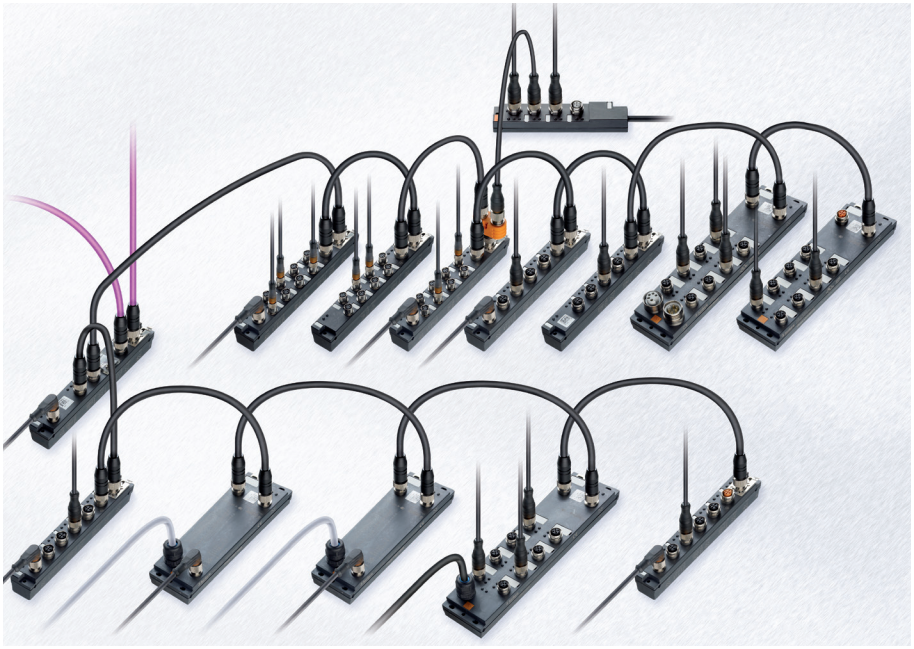
The LioN-Link Decentralized I/O Fieldbus System

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.

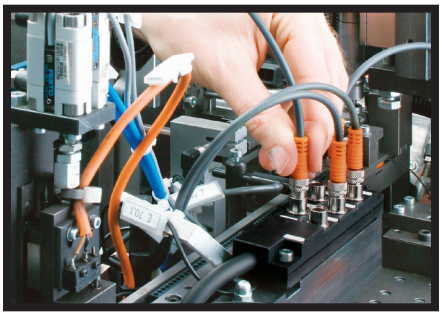
LioN-Link offers a complete range of connection components at the field level. These include:

- 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.

PROFIBUS® PROFINET® CANopen DeviceNet™ IO-Link

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

Explination of Product Features

UL approved

Highly resistant to oils, coolants, lubricants and emulsions.

Highly resistant to vibration and shock.

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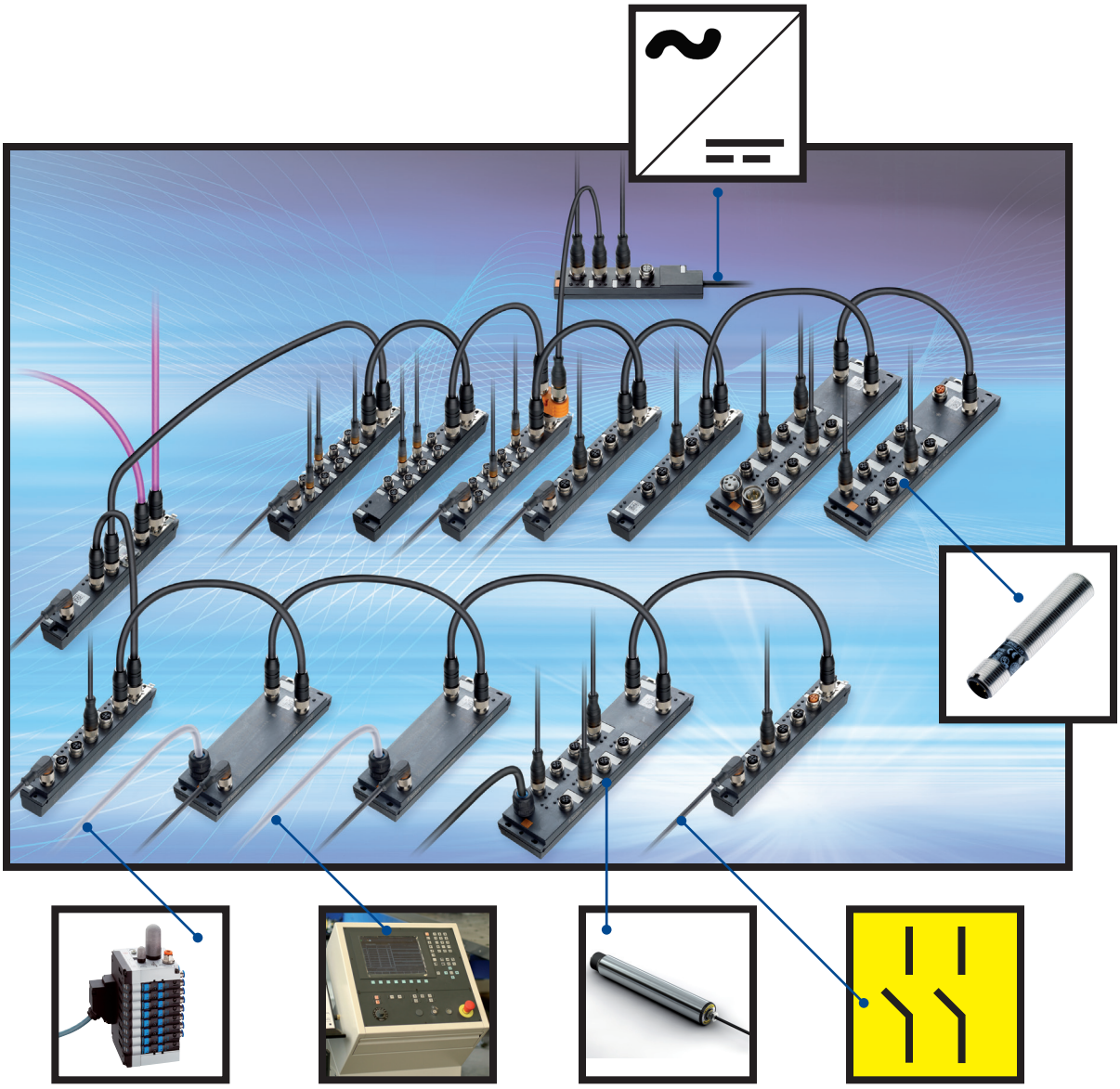
LioN-Link Provides Flexibility in Application Design



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.

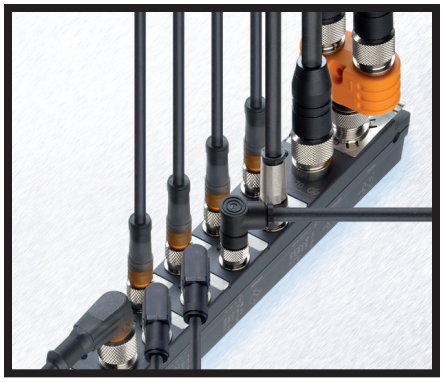
Advantages

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

Link Wiring With:

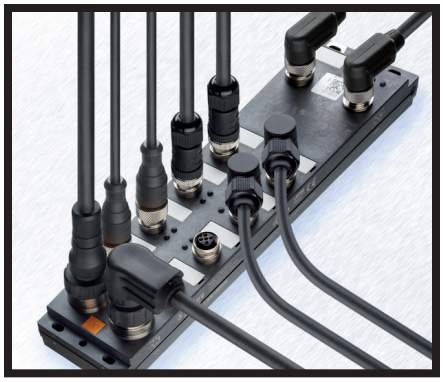
CAN / DeviceNet Thin Cables

...or



Standard Actuator/Sensor Cordsets, Single and Double Ended

...or



Field Attachable M12 Connectors

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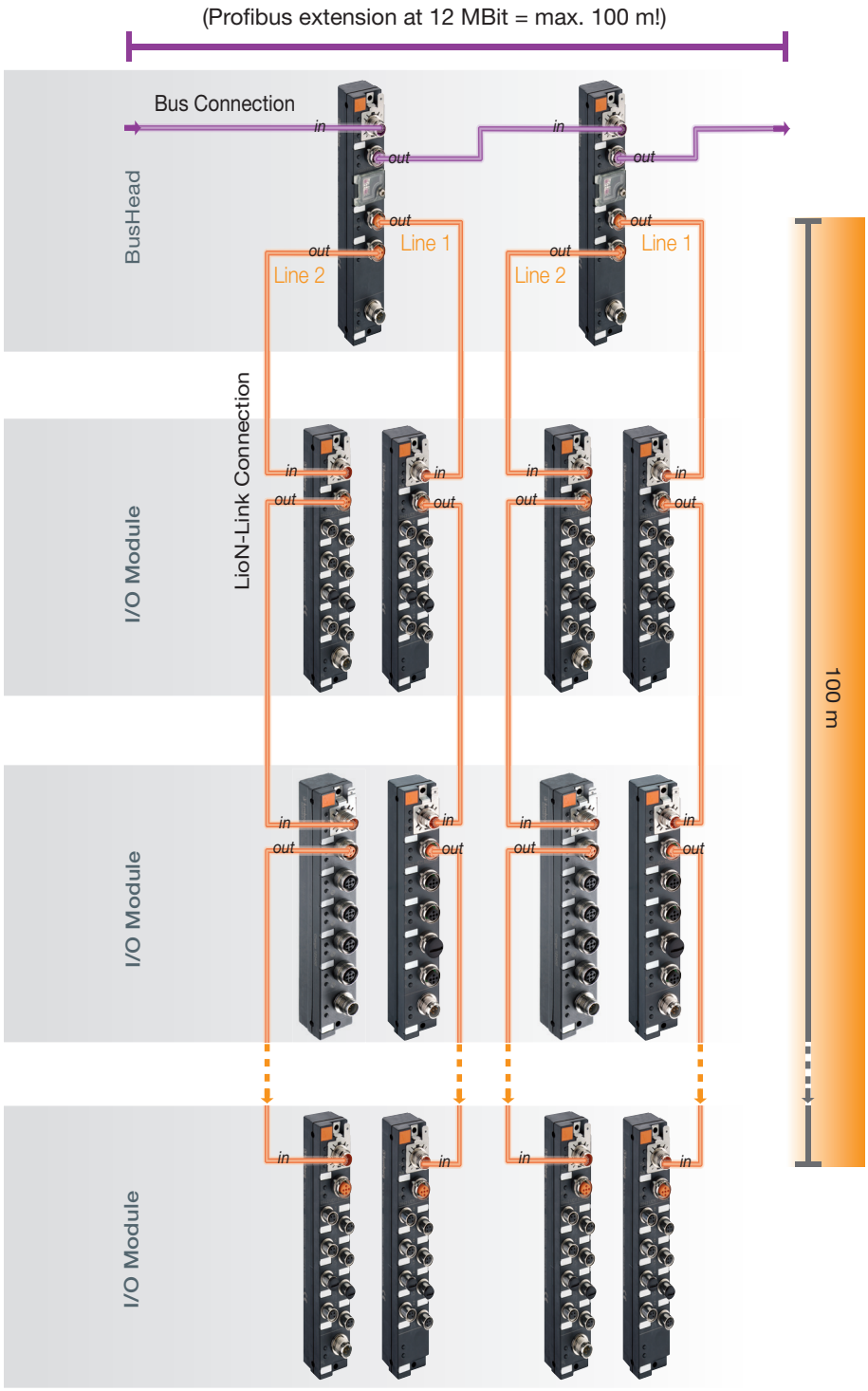
LioN-Link Wiring is Ideal for Large I/O Expansion

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 mm². 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.

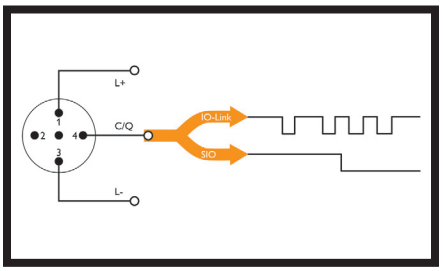


Effective Connectivity Solutions with LioN-Link
Support for I/O-Link: 0940 PSL 602/0940 ESL 601 and 0942 UEM 620

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.

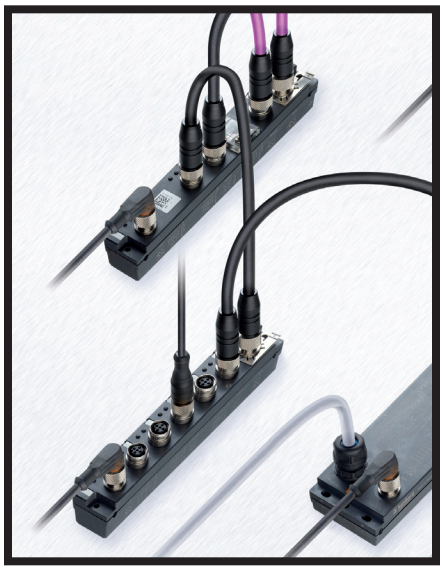
Effective Connectivity Solutions with LioN-Link. Outputs for Safety Critical Applications with 0942 UEM 612

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.

IO-Link

PROFIBUS

PROFINET



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

Customized Solutions for High Flexibility

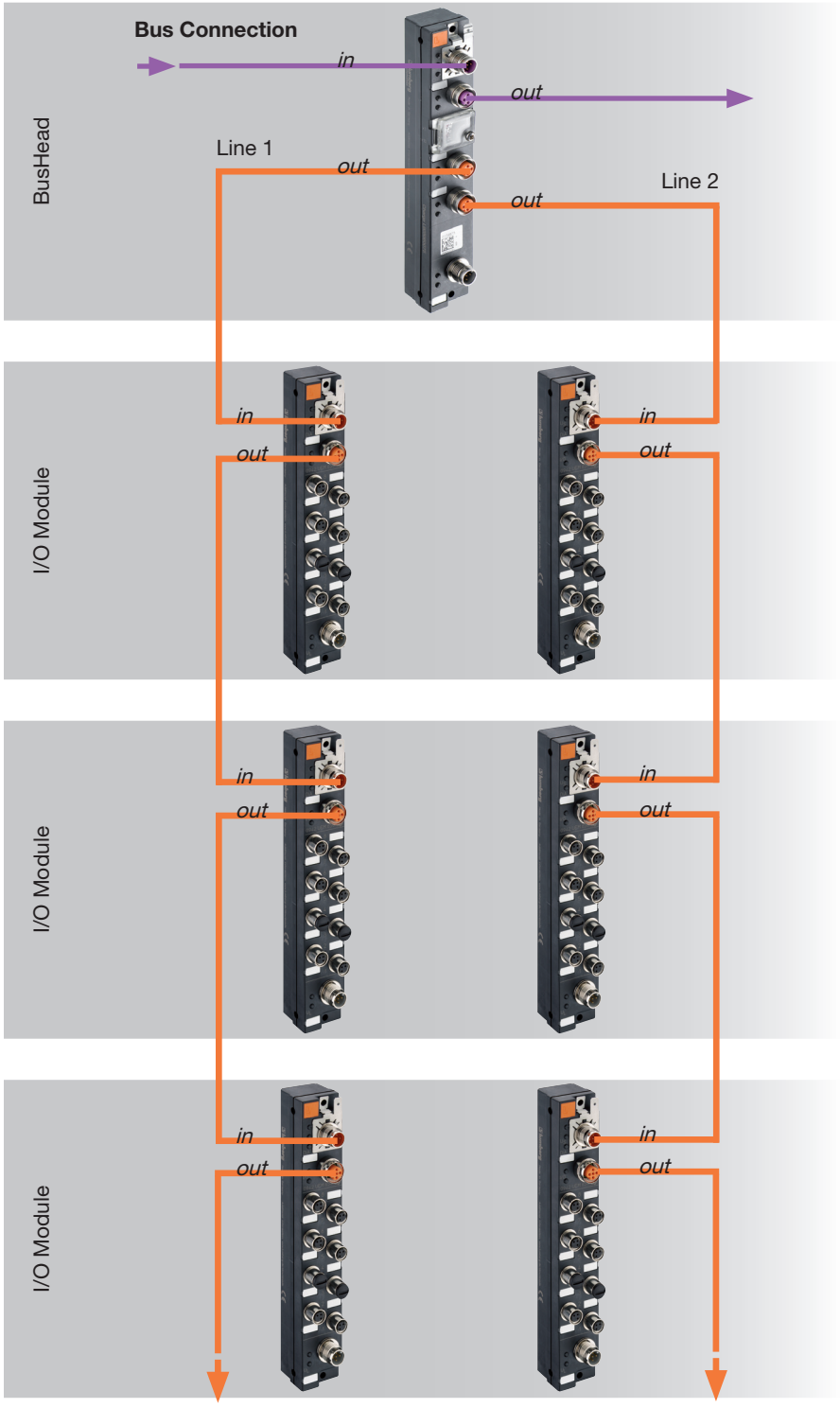
The 0940 PSL 603 bus coupler module permits the integration of up to 30 shadow modules in a Profibus network. Serving as inactive secondary components, these modules each provide eight digital I/O connections.

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).



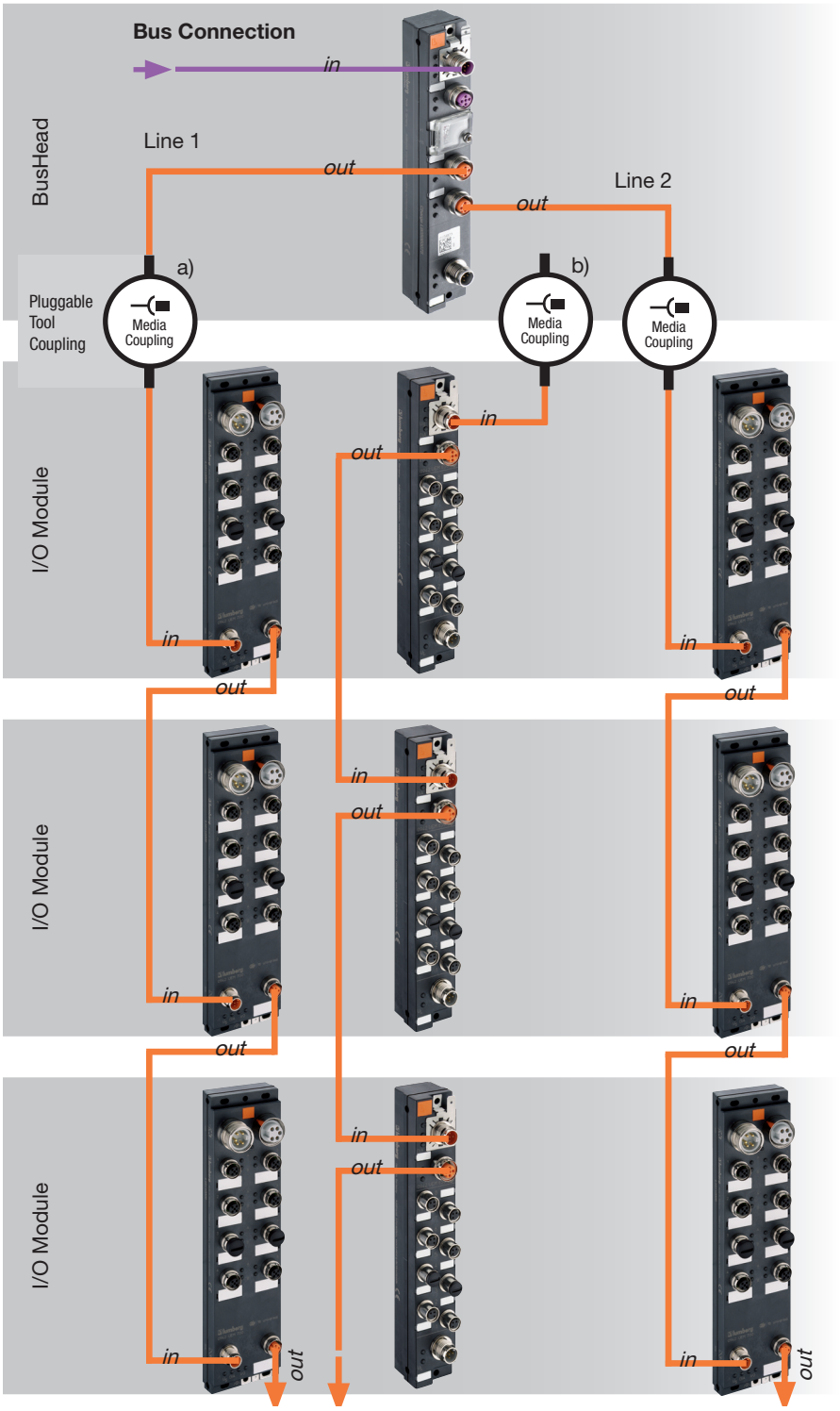
Effective Connectivity Solutions with LioN-Link
Tool Changer Mode: 0940 PSL 603

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.



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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 controland 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.