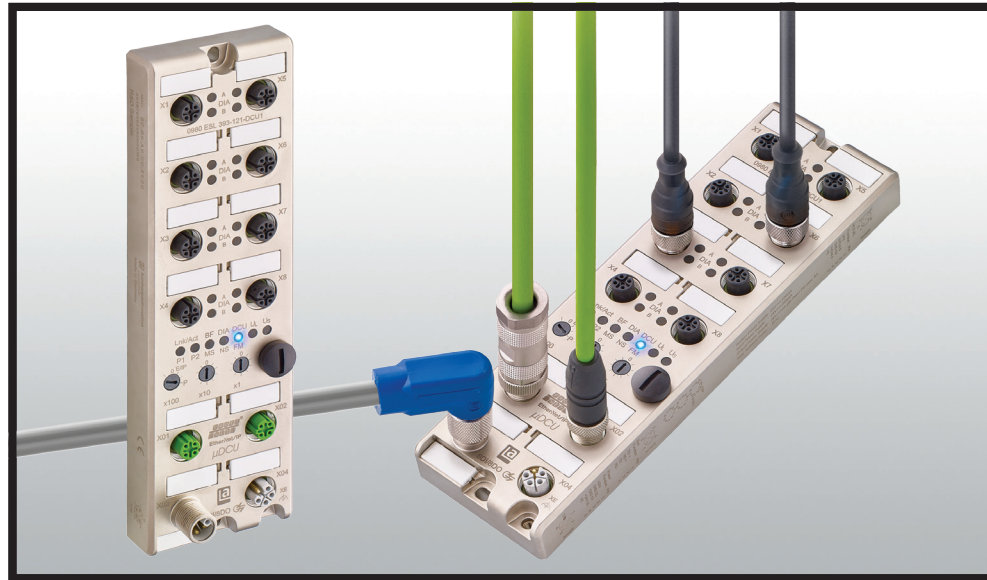


## Product Bulletin

**PB00085**

### One-Device Automation LioN-Power Field Level PLC ( $\mu$ DCU)

LioN-Power  $\mu$ DCU ( $\mu$  =micro) is the first device that combines the benefits of a field I/O and a programmable logic controller (PLC).



**Distributed control units (DCUs) are IP67 I/O modules with integrated programmable logic controller (PLC) functionality that can perform a range of functions – from simple logical operations to solving more complex control problems directly on the module, making one-device automation a reality.**

- **Innovative** – get the world's first field programmable controller I/O module that provides multiprotocol support with M12 Power technology.
- **Highly Flexible** – use the  $\mu$ DCU as a slave I/O to a central PLC, as a standalone controller or in a mixed DCU mode in combination with a PLC.
- **Transformative** – make fieldbus machines instantly Ethernet-ready by placing a  $\mu$ DCU in the machine and tapping into existing sensor data.

Designed for the Industrial Internet of Things (IIoT), the LioN-P  $\mu$ DCU provides you with the next innovation in I/O modules, including integrated PLC functionality. This allows you to perform tasks in the field (IP67) without a control cabinet higher level PLC.

#### Applications

With LioN-Power  $\mu$ DCU modules, you can easily handle a variety of automation applications in the DCU operation mode -- such as sorting pieces on a conveyor belt -- without any higher level PLC.

Furthermore, you can use these modules to make existing fieldbus machines IP-ready. That means  $\mu$ DCUs are ideal if you don't want to undergo a complete redesign to upgrade to new technologies.

#### Your Benefits

LioN-Power  $\mu$ DCUs offer the flexibility to meet your evolving needs.  $\mu$ DCU modules independently control applications, perform timer, counter and more functions, and exchange data with higher-level controllers. They enable fast, intuitive installation and maintenance because they can retain configuration and be programmed for a "plug-and-play-like" module exchange.

**Multi-PROTOCOL**



**EtherNet/IP**

**EtherCAT**



DCUs execute communication, separate diagnostic data from process data and allow cyber physical connections – all of which alleviate the burden typically placed on the PLC.

### LioN-Power Distributed Control Units – The $\mu$ DCU for Ladder Logic Programming

LioN-Power  $\mu$ DCUs represent the latest innovation in I/O modules, providing an economical solution for field level automation. You can program  $\mu$ DCUs with the freeware programming tool LDmicro in Ladder Logic (LAD). This gives you an accelerated, cost-effective path to field-level automation and the capabilities of IIoT. This makes  $\mu$ DCU well suited for smaller automation applications and smaller machine builders.

$\mu$ DCUs are able to:

- Control the on-board I/Os independently from the higher level PLC
- React to diagnostic events (short-circuit, under voltage)
- Communicate simultaneously with a connected PLC
- Share information on an Industrial Ethernet network

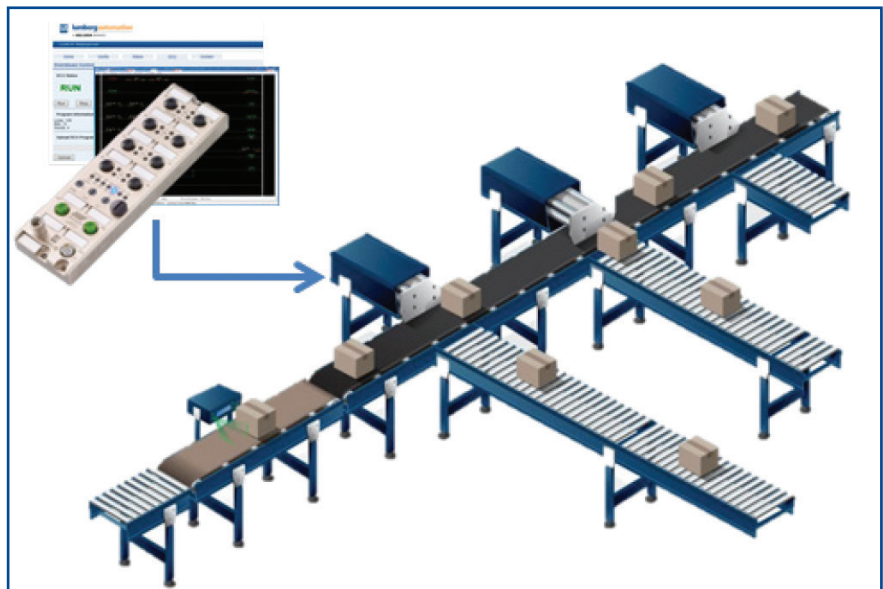
The computational capabilities of a DCU may also be employed to process diagnostics data to feed predictive maintenance tools and other cloud services.

These modules are a part of Lumberg Automation's LioN-Power system, a one-stop solution for all your automation needs including connectivity, adapters, other I/O modules and more.

### Example application: Sorting pieces on a conveyor belt in a mixed DCU / PLC mode

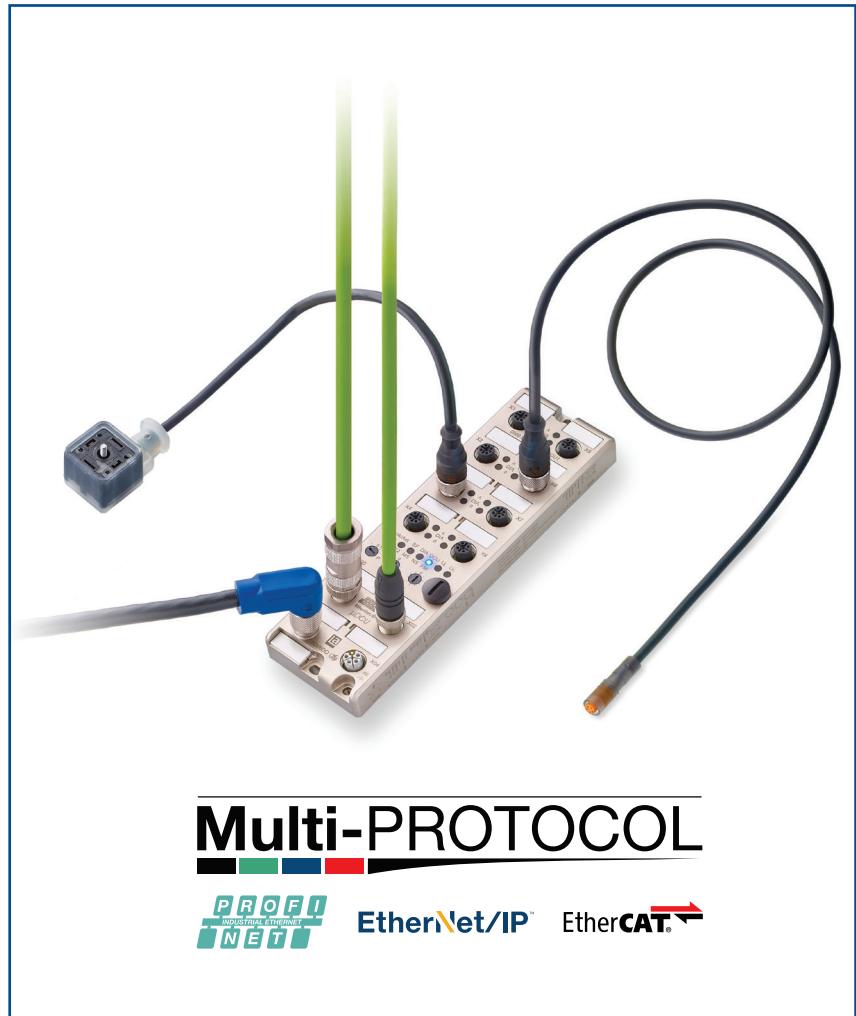
In this application, the  $\mu$ DCU is tasked to process the sensor inputs that detect the presence of packages. In the next sequence, the  $\mu$ DCU activates the actuators that move the workpiece to the correct end-point palletizer. The  $\mu$ DCU will trigger the movement when receiving the "go" signal from the higher level PLC via the Industrial Ethernet network. This way the intelligence sits directly in the machine.

Standalone One-Device Automation directly where you need it, for the highest application flexibility in the field level



#### Benefits at a Glance

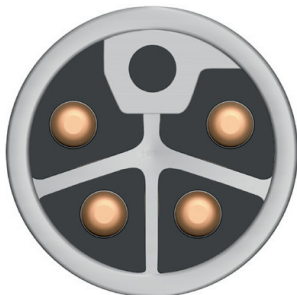
- Achieve one-device automation through field-level PLC functionality
- Easily program through the freeware tool LDmicro in ladder logic (maximum of 99 rungs)
- Easily upload the application program using the µDCU's embedded webserver
- Meet multiple needs with a variety of operation modes, including I/O device, standalone DCU mode or mixed DCU mode in combination with a higher-level PLC
- Secure strong DCU performance with a minimum 10 millisecond cycle time
- Expand data exchange with 8 digital inputs and 8 digital outputs on-board, galvanic isolation and up to 2 A output current per port
- Be global-ready with UL 61010-1 approval and multiprotocol support for PROFINET, EtherNet/IP and EtherCAT
- Employ the highest current rating in the industry to increase power transmission using a 2 x M12 L-coded power supply connection with up to 16 amps
- Withstand harsh conditions – IP65, IP67 and IP69K-rated tolerances for mechanical stress



World's first field programmable controller I/O module providing multiprotocol support with M12 Power L-coding technology

**M12 L-coded**

**24 V / 16 A**













**Power**

**61076-2-111/CD IEC (E)**



## LioN-Power Distributed Control Unit – LDmicro (Ladder Logic)

### Technical Information

Product Description	
Type	0980 ESL 393-121-DCU1
	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">   </div> <div style="text-align: center;">  </div> <div style="text-align: center;">      </div> <div style="text-align: center;">   </div> <div style="text-align: center;"> <p>LDmicro</p> </div> </div>
Description	LioN-P Distributed Control Unit, LDmicro Programmable (Ladder), Multi-protocol (PROFINET, EtherNet/IP or EtherCAT device), 8 digital input and 8 digital output channels with galvanic isolation, M12 LAN connection, 4-pole, D-coded, M12 L-coded power supply, 5-pole
Order No.	934879005
Technical Data	
Protection Degree	IP65, IP67, IP69K (only if mounted and locked in combination with Hirschmann/Lumberg connector)
Ambient Temperature (Operation)	-20 °C to +70 °C
Dimensions (W x H x D)	59.6 x 30.7 x 200 (mm)
Weight	500 g
Housing Material	Metal, Zinc Die-cast
Control System	
Programming Tool	Ldmicro: Ladder programming tool (LAD)
Programming Language	LAD: Ladder Logic
Program Deployment	via Webservice
Realtime Clock	No
Performance	min. 10 ms
Program Memory	max. 99 Rungs/max. 99 Bit Variables/max. 99 Integer Variables
Flash Memory	16 MB
Persistent Memory	No
Processor	200 MHz RISC CPU
Operation Modes	Standalone, Slave/Device, Mixed
Communication Interfaces	Ethernet/TCP
Webservice	Integrated
Bus System	
Protocol	PROFINET / EtherNet/IP / EtherCAT I/O Device
Connection	M12 LAN, 4-pole, D-coded
Transmission Rate	Fast Ethernet (10/100 Mbit/s), Full Duplex
Rotary Address Switches	Yes, 3x
Power Supply	
Nominal Voltage	24 V DC (SELV/PELV)
Nominal Voltage Range	18 to 30 V DC
Connection	M12 Power, 5-pole, L-coded
Current Carrying Capacity of Connector	16 A
Current Consumption (typ.)	160 mA (+/-20% at 24 V DC)
On-Board Input Channels	
Number of Channels	8
Connection	M12, 5-pole, A-coded
Channel Type	Type 3 acc. to IEC 61131-2
Nominal Voltage	24 V DC via US (system power supply)
Sensor Current Supply	200 mA per Port
Sensor Type	PNP
On-Board Output Channels	
Number of Channels	8
Connection	M12, 5-pole, A-coded
Channel Type	p-switching
Nominal Voltage	24 V DC via Uaux (actuator power supply)
Output Current per Channel	max. 2 A
Output Current per Module	max. 9 A
Protective Circuit	Electronically: Overload protection, short-circuit protection
Galvanically Isolated	Yes



## LDmicro: Ladder Logic Programming Tool

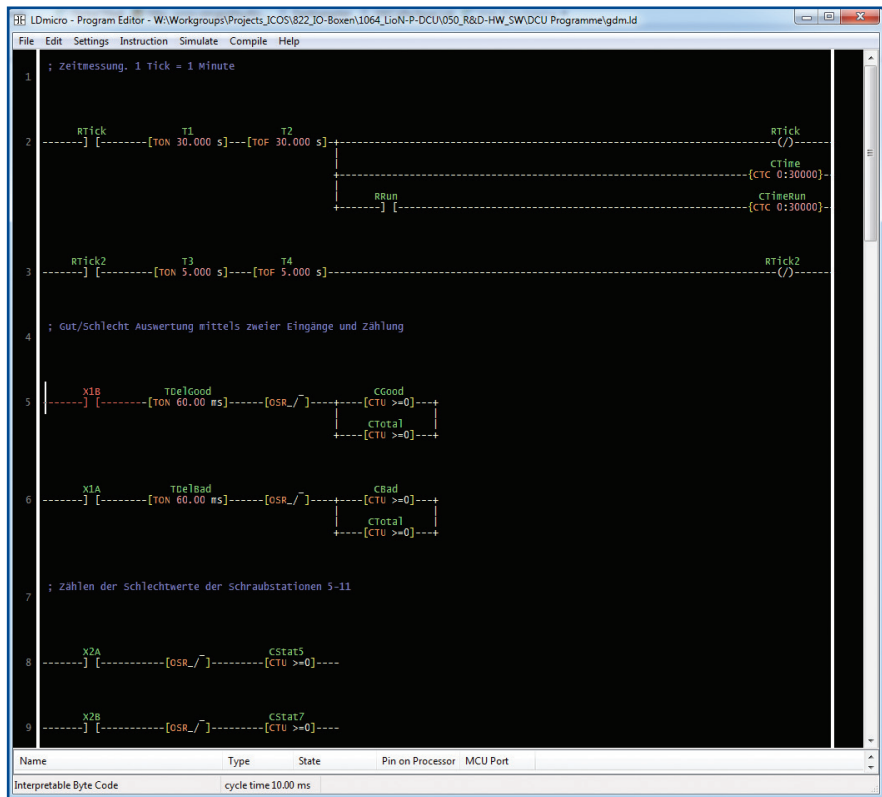
With LDmicro, you can create programs for µDCUs in a Ladder Diagram style according to EN61131-3. LDmicro offers a large number of instructions:

- Bit operations such as contact, coils, set/reset
- Edge detection
- Timers and turn on / off delays
- Up / down / circular counters
- 16 Bit signed arithmetic operations

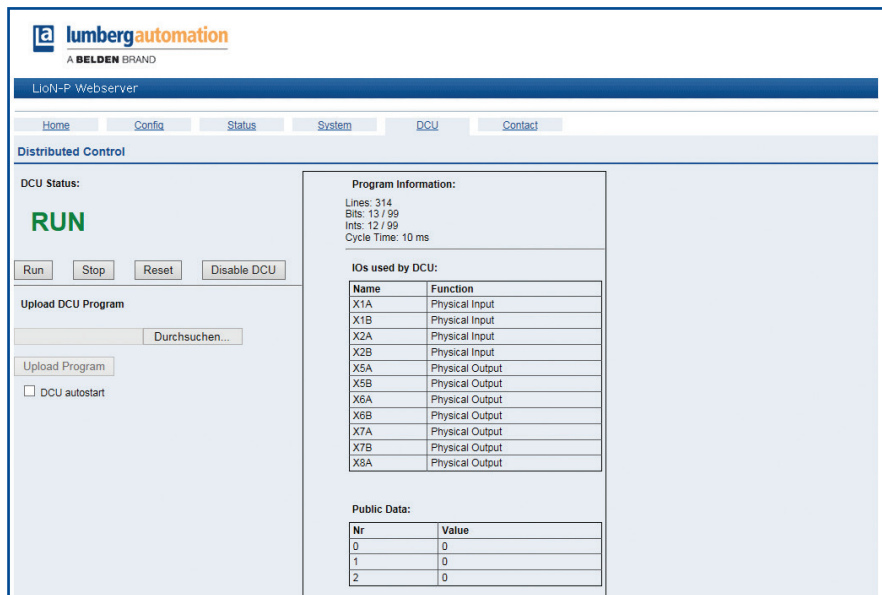
### About Ladder Logic

Originally introduced as a method for documenting design and construction of relay racks used in manufacturing and process control, Ladder Logic uses a graphical programming approach. Each relay rack displays on screen as a rung, positioned on a ladder. The vertical rails of the ladder represent connections to the devices below.

Ladder logic has evolved into a more robust programming language that now uses a graphical diagram based on the circuit diagrams of relay logic hardware. It is commonly used to develop software for programmable logic controllers (PLCs) in industrial control applications.




LDmicro supports a maximum of 99 rungs in ladder logic.



The application program can be easily uploaded through the µDCU's embedded webserver.



Type	0980 ESL 3xx-121-DCU1	
Power Supply	M12 Power L-coded	
		
I/O Variant	8DI 8DO	16DIO
<b>Multi-PROTOCOL</b>	0980 ESL 393-121-DCU1	0980 ESL 390-121-DCU1
	934879005	In 2017



## Belden Competence Center

As the complexity of communication and connectivity solutions has increased, so have the requirements for design, implementation and maintenance of these solutions. For users, acquiring and verifying the latest expert knowledge plays a decisive role in this. As a reliable partner for end-to-end solutions, Belden offers expert consulting, design, technical support, as well as technology and product training courses, from a single source: Belden Competence Center. In addition, we offer you the right qualification for every area of expertise through the world's first certification program for industrial networks. Up-to-date manufacturer's expertise, an international service network and access to external specialists guarantee you the best possible support for products. Irrespective of the technology you use, you can rely on our full support – from implementation to optimization of every aspect of daily operations.

### About Belden

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

For more information, visit us at [www.beldensolutions.com](http://www.beldensolutions.com) and follow us on Twitter [@BeldenIND](https://twitter.com/BeldenIND).