

Manual

LioN-P multiprotocol

Digital I/O modules and IO-Link Master:

0980 ESL 390-121

0980 ESL 391-121

0980 ESL 392-121

0980 ESL 393-121

0980 ESL 390-121-DCU1

0980 ESL 393-121-DCU1

0980 ESL 390-111

0980 ESL 391-111

0980 ESL 392-111

0980 ESL 393-111

0980 ESL 199-121

0980 ESL 199-122

0980 ESL 199-331

0980 ESL 199-332

0980 ESL 398-121

0980 ESL 399-121



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1 About this manual

1.1 General information

Please read the explanations and configuration instructions in this manual carefully before starting up the LioN-P multiprotocol modules. Keep this manual where it is accessible to all users.

The texts, illustrations, diagrams, and examples serve to illustrate the multiprotocol functionality of the LioN-P multiprotocol modules.

Please contact us if you have any detailed questions on installing and starting up the devices. We will be happy to help you.

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Belden Deutschland GmbH – Lumberg Automation™ – reserves the right to make technical changes or changes to this manual at any time without notice.

1.2 Version information

Index	Created	Changed	Changed
Version number	Version 1.0	Version 1.1	Version 1.2
Date	February 2016	September 2016	February 2017
Name/department	Lieb/R&D	MJ/R&D	GL/MJ/R&D

Table 1: Overview of manual revisions

2 About the LioN-P module series

LioN modules (Lumberg input/output Network) function as the interface in an industrial fieldbus system: They enable a central controller on the management level to communicate with the decentralized sensors and actuators on the field level. The line or ring topologies that they can be used to create not only ensure reliable data communication but also significantly reduce the cables required and thus also the costs for installation and maintenance. They additionally enable easy, quick extension.

The modules of the LioN-P series have been substantially reduced in size compared with the well-known LioN-R family; the modules have a very rugged metal housing made of die-cast zinc. Housing variants with widths of 30mm and 60mm and different connector types are available. The completely cast device housing protects the module electronics from environmental effects and allows the device to be used in a wide temperature range. Despite the sturdy construction, the modules have compact dimensions and a low weight. They are especially suitable for use in machines and installations with a moderate I/O concentration over separate assemblies.

3 Multiprotocol

The multiprotocol modules allow you to select different protocols for communication within a fieldbus system. In this way the multiprotocol modules can be integrated into different networks without it being necessary to purchase modules specific for each protocol. This technology also gives you the option to use the same module in different environments.

Using rotary encoding switches at the bottom of the modules, you can easily and conveniently set both the protocol and the address of the module, if the protocol to be used supports this. Once you have made a protocol selection and started the cyclical communication, the module remembers this setting and uses the selected protocol from this point on. To use another supported protocol with this module, perform a factory reset.

For more about general settings, refer to the following sections on how to set the protocol for EtherNet/IP, PROFINET and EtherCAT or how to perform a factory reset if necessary.

4 Protocol settings for Digital I/O modules

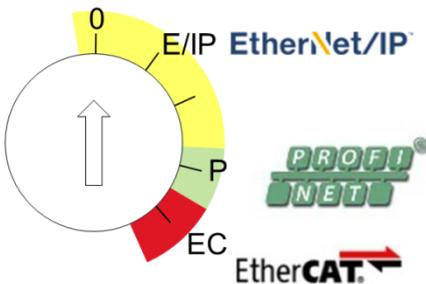
4.1 EtherNet/IP – PROFINET – EtherCAT

The following Digital - I/O modules support multiprotocol application for the protocols EtherNet/IP (E/IP), PROFINET (P) and EtherCAT (EC):

- ▶ 0980 ESL 390-121
- ▶ 0980 ESL 391-121
- ▶ 0980 ESL 392-121
- ▶ 0980 ESL 393-121
- ▶ 0980 ESL 390-121-DCU1
- ▶ 0980 ESL 393-121-DCU1
- ▶ 0980 ESL 390-111
- ▶ 0980 ESL 391-111
- ▶ 0980 ESL 392-111
- ▶ 0980 ESL 393-111

The multiprotocol modules have a total of three rotary encoding switches. With the first rotary encoding switch (x100) you set the protocol by using the corresponding switch position.

With the other rotary encoding switches, you set the last two digits of the IP address when you are using EtherNet/IP.



Protocol	x100	x10	x1
EtherNet/IP	0-2	0-9	0-9
PROFINET	P	-	-
EtherCAT	EC	-	-

Table 2: Assignment of the rotary encoding switches for each protocol

The setting you make to select a protocol is described detailed in the protocol-specific sections.

In delivery state no protocol settings are stored in the module. In this case only the desired protocol has to be chosen. To take over a changed rotary switch setting (protocol setting), a power cycle or “Reset” from the web interface is necessary.

Please wait 10 seconds before power cycling the device after start-up with changed rotary switch settings due to internal memory write processes.

Once you have set the protocol using the rotary encoding switches, the module stores this setting when it starts in cyclic communication. Changing the protocol using the rotary encoding switch is no longer possible after this point. The module will always start using the stored protocol from that point on. The IP address can be changed depending on the selected protocol.

To change the protocol, carry out a factory reset. In this way you restore the factory settings of the respective module. How you perform the factory reset for your module is described in chapter [“Factory reset” on page 10](#).

If you position the rotary encoding switch in a manner that is invalid, the device signals this to you with a blink code (the BF/MS/ERR LED blinks in red three times).

4.1.1 EtherNet/IP

If you decide to use EtherNet/IP as a protocol, use the first rotary encoding switch to set the 100 value of the last octet of the IP address of the module. Using the first switch, a value from 0 to 2 can be set for the IP address. The second rotary encoding switch (x10) can be used to configure the 10 position of the last octet of the IP address, and the third rotary encoding switch (x1) allows you to configure the 1 position. Values between 0 and 9 can be selected for the second and third switches. The first three octets of the IP address are set by default to 192.168.1.

For example, the rotary encoding switch setting 2(x100), 1(x10) and 0(x1) gives you an IP address of 192.168.1.210 for EtherNet/IP.

For more information use the LiON-P EtherNet/IP Digital I/O manual.

4.1.2 PROFINET

If you decide to use PROFINET, set the first rotary encoding switch to the value of P. For more Information use the LioN-P PROFINET Digital I/O manual.

4.1.3 EtherCAT

If you decide to use EtherCAT, set the first rotary encoding switch to the value of EC. For more information use the LioN-P EtherCAT Digital I/O manual.

4.2 Factory reset

A factory reset restores the original factory settings and thus resets the changes and settings you have made up to that point. It also resets the protocol selection. To perform a factory reset, set the first rotary encoding switch (x100) to 9, the second (x10) to 7, and the third (x1) also to 9. Afterwards perform a power cycle and wait 10 seconds.

Follow the steps from section [“EtherNet/IP – PROFINET – EtherCAT”](#) on [page 8](#) again to select a new protocol.

	x100	x10	x1
Factory Reset	9	7	9

5 Protocol settings for IO-Link master

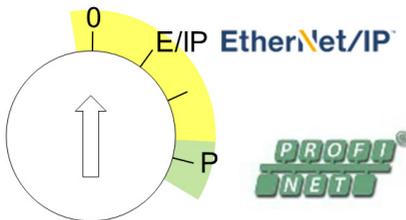
5.1 EtherNet/IP – PROFINET

The following LioN-P IO-Link master modules support multiprotocol application for the protocols EtherNet/IP (E/IP) and PROFINET (P):

- ▶ 0980 ESL 199-121
- ▶ 0980 ESL 199-122
- ▶ 0980 ESL 199-331
- ▶ 0980 ESL 199-332
- ▶ 0980 ESL 398-121
- ▶ 0980 ESL 399-121

The multiprotocol modules have a total of three rotary encoding switches. With the first rotary encoding switch (x100) you set the protocol by using the corresponding switch position.

With the other rotary encoding switches, you set the last two digits of the IP address when you are using EtherNet/IP.



Protocol	x100	x10	x1
EtherNet/IP	0-2	0-9	0-9
PROFINET	P	-	-

Table 3: Assignment of the rotary encoding switches for each protocol

The setting you make to select a protocol is described detailed in the protocol-specific sections.

In delivery state no protocol settings are stored in the module. In this case only the desired protocol has to be chosen. To take over a changed rotary switch setting (protocol setting), a power cycle or “Reset” from the web interface is necessary.

Once you have set the protocol using the rotary encoding switches, the module stores this setting when it starts in cyclic communication. Changing the protocol using the rotary encoding switch is no longer possible after this point. The module will always start using the stored protocol from that point on. The IP address can be changed depending on the selected protocol.

To change the protocol, carry out a factory reset. In this way you restore the factory settings of the respective module. How you perform the factory reset for your module is described in chapter “[Factory reset](#)” on [page 13](#).

If you position the rotary encoding switch in a manner that is invalid, the device signals this to you with a blink code (the BF/MS LED blinks in red three times).

5.1.1 EtherNet/IP

If you decide to use EtherNet/IP as a protocol, use the first rotary encoding switch to set the 100 value of the last octet of the IP address of the module. Using the first switch, a value from 0 to 2 can be set for the IP address. The second rotary encoding switch (x10) can be used to configure the 10 position of the last octet of the IP address, and the third rotary encoding switch (x1) allows you to configure the 1 position. Values between 0 and 9 can be selected for the second and third switches. The first three octets of the IP address are set by default to 192.168.1.

For example, the rotary encoding switch setting 2(x100), 1(x10) and 0(x1) gives you an IP address of 192.168.1.210 for EtherNet/IP.

For more information use the LioN-P EtherNet/IP IO-Link manual.

5.1.2 PROFINET

If you decide to use PROFINET, set the first rotary encoding switch to the value of P.

For more information use the LioN-P PROFINET IO-Link manual.

5.2 Factory reset

A factory reset restores the original factory settings and thus resets the changes and settings you have made up to that point. It also resets the protocol selection. To perform a factory reset, set the first rotary encoding switch (x100) to 9, the second (x10) to 7, and the third (x1) also to 9. Afterwards perform a power cycle and wait 10 seconds due to internal memory write processes.

Follow the steps from section [“EtherNet/IP – PROFINET” on page 11](#) again to select a new protocol.

	x100	x10	x1
Factory Reset	9	7	9