

PB 327

**Lumberg Automation™
EtherNet/IP™ Modules
for Industrial Automation
Applications**

These 16 digital I/O channels with universal input/output functionality for direct connections between sensors/actuators and control systems offer a high level of flexibility.



Easy, Fast and Secure Operations with the New Ethernet/IP Modules from the Lion-M Series are Particularly Suitable for Use in Mechanical Engineering, Materials Handling and Filling and Packaging Systems.

EtherNet/IP is one of the most important network standards in the field of automation. These two new Lion-M I/O modules support the latest EtherNet/IP protocols and connect sensors and actuators directly to control systems.

The I/O modules integrated dual-port switch facilitates a line topology as well as star topology. They also enable one to continue using existing communications structures, such as cable trays and energy chains, without modifying the physical layout, which leads to cost savings.

These modules also facilitate a high-availability ring topology: if the connection goes down, the device level ring protocol (DLR) immediately switches to an alternative ring segment without interrupting machinery operations.

These two I/O modules provide 16 digital channels. In one version (16DI) the channels are used as inputs. The universal modules (16DIO universal) provide both 16 digital inputs and outputs – in any desired combination and without any need for individual parameterization. Accordingly, these modules offer a very high level of flexibility not only at the planning stage but also when making changes during commissioning or subsequent upgrades.

In addition, the “easy diagnostic” concept with a diagnostic display for each I/O port enables one to pinpoint any fault. The same information is also available via the Ethernet/IP protocol, facilitating detailed analysis on a centralized control and display system – without any need to configure the module. Thus, time-consuming error localization is outdated: minimizing downtimes and maintenance periods, while increasing the availability of installation.

The color-coding of the individual plug-in connectors enables immediate recognition of the function of various sockets (fieldbus, power supply or I/O). At a glance, one can see which cable connection is required. The optimized arrangement of the M12 I/O sockets considerably simplifies the installation process – even T distributors can be installed with ease.

Benefits:

- High degree of flexibility
- Functional stability
- Ease of use
- Reduces install and maintenance costs



LioN-M I/O Modules from Lumberg Automation™



Connections at a Glance:

The power supply, connected via two gray four-pole 7/8" sockets, has a rated voltage of 24 V and a range of 11 to 30 V.

The eight black I/O sockets, each of which can send and/or receive two digital signals, have five-pole A-coded M12 connectors. Each of these 16 digital channels has a rated output current of up to 1.6 A and a maximum current density of 9 A. The optimized arrangement of the M12 I/O sockets considerably simplifies the installation process, permitting the ease of installation of Tee-distributors. The two network ports have four-pole D-coded M12 connectors. To prevent confusion, the network ports – like the casing of the EtherNet/IP cables – are marked in green.

The IP address can conveniently be set up using rotary switches. The I/O modules are configured directly via the user interface of the control unit. You can download the necessary base data from "www.lumberg-automation.com".

The I/O modules are remarkable for their strong PBT (polybutylene terephthalate) housings and measure 243L x 60W x 39.5H mm, including the sockets for the power supply. They also fulfill the requirements for an ingress protection rating of IP 67 and are designed for use within the temperature range -10°C to +60°C.

The Advantages at a Glance:

- Connection of sensors and actuators to EtherNet/IP networks
- Integrated dual-port switch (10/100 Mbit/s) facilitates line topology
- Ring topology by means of the device level ring protocol
- 16 digital channels, either as inputs (0980 ESL 711) or universally as inputs and/or outputs (980 ESL 710)
- M12 connections for network ports and I/O sockets
- Fail-safe connections - color coding of network ports
- Rotary switches for easy IP address selection
- Configuration via the control system's user interface
- Strong and compact PBT housing
- Ingress protection rating IP67
- Temperature range -10°C to +60°C
- Power supply with voltage rating of 24 V
- Flexible front or side mounting

These new Ethernet/IP I/O modules fully support the device level ring (DLR) protocol and permit both ring and line topologies.



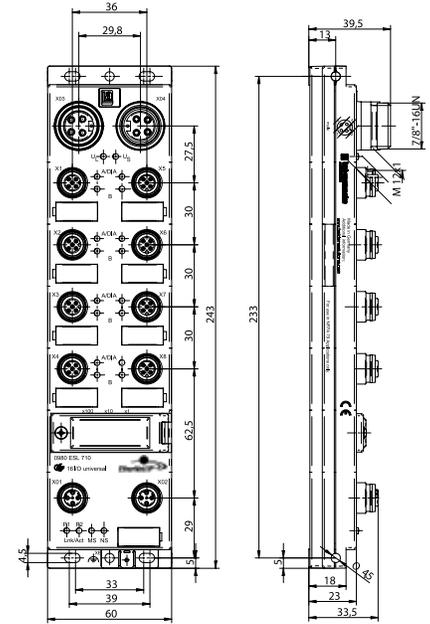
0980 ESL 710



EtherNet/IP I/O Modules with 16 Digital Inputs and 16 Digital Outputs

16 IN / 16 OUT (universal)

EtherNet/IP Device with 16 digital I/O channels, channels can be used universally as inputs or outputs, M12 socket, rotary address switches for addressing, M12 LAN-Ports, D-coded, 7/8" power supply.



Bit Assignment

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

Diagnostic Indication

LED	Indication	Condition
1...8 A	Yellow	Channel status 1
1...8 DIA A	Red	Periphery fault
1... 8 B	Yellow	Channel status 2
1... 8 DIA B	Red	Periphery fault
Us	Green Off	Sensor power supply applied Sensor power supply missing
Ul	Green Off	Actuator power supply applied Actuator power supply missing
P1 Lnk/Act	Green Yellow flashing	Connected to an Ethernet device I/O device exchanging data
P2 Lnk/Act	Green Yellow flashing	Connected to an Ethernet device I/O device exchanging data
MS (Module status)	Green Green flashing Red/Green flashing Red flashing Off	Device is ready for operating Wrong configuration Self test is running Firmware update Device is off
NS (Network status)	Green Green flashing Red Red flashing Off	Connection to master exists IP address exists, but no connection to the master IP address is used by a different device Connection has timed out Device is off

Pin Assignment

LAN connection M12, D-Coded	Power supply 7/8"	Input M12
<p>1 = TD+ 2 = RD+ 3 = TD- 4 = RD Housing = shielding</p>	<p>1 = +24 V Actuators 2 = +24 V Logic/Sensors 3 = GND (0 V) Logic/Sensors 4 = GND (0 V) Actuators Housing = PE</p>	<p>1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = earth Housing = FE</p>

The use of these products in aggressive media should be verified in each case. Technical modifications reserved.

EtherNet/IP I/O Modules with 16 Digital Inputs and 16 Digital Outputs

0980 ESL 710

Technical Data

Environmental

Degree of Protection IP 67
 Operating Temperature Range -10°C (+14°F) to +60°C (+140°F)

Mechanical

Weight 380 g
 Housing Material PBT

Bus system EtherNet/IP

Transmission Rate 10/100 Mbs
 Address Range 0-255
 Rotary Address Switches 0-255
 Default Address 0

System/Sensor Power Supply

Rated Voltage 24 V DC
 Voltage Range 11–30 V DC
 Power Consumption typ. 90 mA
 Reverse Polarity Protection yes

Input power supply Us

Voltage range 19–30 V DC
 Sensor current 200 mA (at T_{amb} 30°C)
 Short-circuit proof yes
 Indication LED green

Inputs Type 3, IEC 61131-3

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 Indication LED red per socket

Output power supply Uo

Rated Voltage 24 V DC
 Voltage Range 19–30 V DC
 Reverse Polarity Protection yes/antiparallel diode
 Indication LED green

Outputs

Rated Output Current 1.6 A per channel
 Short-circuit Proof yes
 Max. Output Current 9 A (12 A) per module
 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 socket

Included in delivery/accessories

Dust covers M12 4 pieces
 Attachable labels 10 pieces

Part Number

0980 ESL 710



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



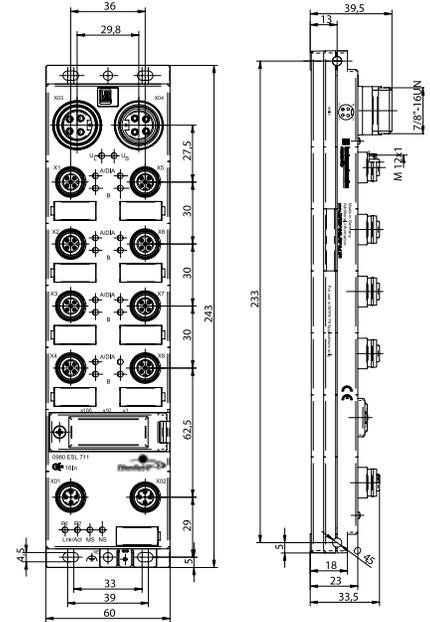
0980 ESL 711



EtherNet/IP I/O Modules with 16 Digital Inputs

16 IN

EtherNet/IP Device with 16 digital input channels, M12 socket, rotary address switches for addressing, M12 LAN-Ports, D-coded, 7/8" power supply.



Bit Assignment

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

Diagnostic Indication

LED	Indication	Condition
1...8 A	Yellow	Channel status 1
1...8 DIA A	Red	Periphery fault
1... 8 B	Yellow	Channel status 2
1... 8 DIA B	Red	Periphery fault
Us	Green Off	Sensor power supply applied Sensor power supply missing
Ul	Green Off	Actuator power supply applied Actuator power supply missing
P1 Lnk/Act	Green Yellow flashing	Connected to an Ethernet device I/O device exchanging data
P2 Lnk/Act	Green Yellow flashing	Connected to an Ethernet device I/O device exchanging data
MS (Module status)	Green Green flashing Red/Green flashing Red flashing Off	Device is ready for operating Wrong configuration Self test is running Firmware update Device is off
NS (Network status)	Green Green flashing Red Red flashing Off	Connection to master exists IP address exists, but no connection to the master IP address is used by a different device Connection has timed out Device is off

Pin Assignment

LAN connection M12, D-Coded	Power supply 7/8"	Input M12
<p>1 = TD+ 2 = RD+ 3 = TD- 4 = RD Housing = shielding</p>	<p>1 = +24 V Actuators 2 = +24 V Logic/Sensors 3 = GND (0 V) Logic/Sensors 4 = GND (0 V) Actuators Housing = PE</p>	<p>1 = +24 V 2 = IN B 3 = GND (0 V) 4 = IN A 5 = earth Housing = FE</p>

EtherNet/IP I/O Modules with 16 Digital Inputs

0980 ESL 711

Technical Data

Environmental

Degree of Protection	IP 67
Operating Temperature Range	-10°C (+14°F) to +60°C (+140°F)

Mechanical

Weight	380 g
Housing Material	PBT

Bus system EtherNet/IP

Transmission Rate	10/100 Mbps
Address Range	0-255
Rotary Address Switches	0-255
Default Address	0

System/Sensor Power Supply

Rated Voltage	24 V DC
Voltage Range	11–30 V DC
Power Consumption	typ. 90 mA
Reverse Polarity Protection	yes

Input power supply Us

Voltage range	19–30 V DC
Sensor current	200 mA (at T _{amb} 30°C)
Short-circuit proof	yes
Indication	LED green

Inputs Type 3, IEC 61131-3

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 Indication	LED red per socket

Included in delivery/accessories

Dust covers M12	2 pieces
Attachable labels	10 pieces

Part Number

0980 ESL 711



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



EtherNet/IP I/O Module Connecting Information



Featured Module: 0980 ESL 710
 EtherNet/IP Device with 16 digital I/O channels, channels can be used universally as inputs or outputs, M12 socket, rotary address switches for addressing, M12 LAN-Ports, D-coded, 7/8" power supply.

Power Supply 7/8" Male Connector, 4 Poles

	Best Part Number RSC 40/9	Description Field Attachable, Male Connector, 4-Pole, PG9 Threads
	or	
	RSC 40/11	Field Attachable, Male Connector, 4-Pole, PG11 Threads
	Best Part Number RKC 40/9	Description Field Attachable, Female Connector, 4-Pole, PG9 Threads
	or	
	RKC 40/11	Field Attachable, Female Connector, 4-Pole, PG11 Threads
	Best Part Number RK 40-XXX/...F RKW 40-XXX/...F	Description Single-Ended 4-Pole Female and Male 7/8" Power Supply Cordsets. Cable Type: TPE or PUR (U.S. Color Code) Cable Number: 637 or 602. NOTE: Also available in double-ended (male to female): RSRK 40-637/...F and RSRK 40-602/...M versions.

I/O Connection Options

	Best Part Number ASB 2-RKT 4-3-XXX/...M or ASB 2 RKT 4-3-632/...M	Description Actuator/sensor cordset, double-ended, M12 Duo male connector with one M12 male connector and one M12 female connector, selflocking threaded joint. Cable Options: 224: PUR, black, halogen-free, 632: PVC, yellow, OR 610: PUR, yellow
	Best Part Number ASBS 2 M12-5	Description Splitter/T-connector with two M12 female connectors, with self-locking Threaded joint
	Best Part Numbers RST 5-RKT 5-XXX/...M	Description Actuator/sensor cordset, double-ended, M12, 5-poles, male straight to female straight connector with self-locking thread and molded cable Cable Options: 228: PUR, black, halogen-free, 259: PUR, orange, halogen-free, weld spark proof, 612: PVC, yellow, 22 AWG, 644: PUR, yellow, 22 AWG NOTE: Also available in right-angle: RST 5-RKWT 5-XXX/...M and single-ended: RST 5-XXX/...M versions.
	Best Part Number RSC 5/7 or RSC 5/9	Description Field attachable connector, M12 male connector, 5-pole with threaded joint, assembling with screw terminals. NOTE: Also available in in right-angle: RSCW 5/7 or RSCW 5/9 and female: RKC 5/7 , RKC 5/9 , RKCW 5/7 , and RKCW 5/9 versions.

EtherNet/IP Connection Options

	Best Part Number 0986 EMC 102	Description Field Attachable, Male Connector, 4-Pole, D-Code, Shieldable with Spring-Type Terminals.
	Best Part Number 0985 XXX 100	Description Double-Ended Media Cordsets, M12, D-Code to M12, D-Code Cable Options: 706: 24 AWG, TPE, Stranded/Unshielded 707: 24 AWG, PVC, Solid/Shielded **S4549: 26 AWG, PUR Halogen-Free, Stranded/Shielded * Denotes cross-over cable ** Denotes not available in cross-over cable
	Best Part Number 0985 XXX 101	
	Best Part Number 0985 XXX 103	Description Double-Ended Media Cordsets, M12, D-Code to RJ45 Cable Options: 706: 24 AWG, TPE, Stranded/Unshielded S4549: 26 AWG, PUR Halogen-Free, Stranded/Shielded

Other EtherNet/IP Products

EtherNet/IP Cord Sets

CORD SET VERSIONS

Description	M12 to M12	M12 to RJ45	M12 to M12 Panel	RJ45 to RJ45
EtherNet/IP high flex double-ended cord set, 4-pin, D-coding, 24 gauge, TPE cable, stranded/unshielded , 2 twisted pair with teal jacket.				
Part Numbers:	0985 706 100 0985 706 101	0985 706 103	0985 706 104	0985 706 500
EtherNet/IP double-ended cord set, 4-pin, D-coding, 26 gauge, PUR halogen-free cable, stranded/shielded , 2 twisted pair with water blue jacket.				
Part Numbers:	0985 S4549 100	0985 S4549 103	0985 S4549 104	0985 S4549 500
EtherNet/IP moderate flex double-ended cord set, 4-pin, D-coding, 24 gauge, TPE cable, solid/unshielded , 2 twisted pair with teal jacket.				
Part Numbers:				0985 705 500
EtherNet/IP moderate flex double-ended cord set, 4-pin, D-coding, 24 gauge, PVC cable, solid/shielded , 2 twisted pair with teal jacket.				
Part Numbers:	0985 707 100 0985 707 101			0985 707 500

0982 EEC 100

Ethernet/IP Unmanaged Switch, IP 67, 5-port switch for 10 and 100 Mbaud transmission rates, M12 socket 4 poles D coding, M12 power supply 5 poles standard coding.



0986 EFC 101

Receptacle connector, M12 female connector, 4-pole, D-coding, PCB contacts with board lock, chassis side thread PG 9.



0986 EFC 152

Receptacle connector, M12 female connector for rear mounting, 4-pole, D-coding, printed contacts, chassis side thread PG 9 (panel nut RSKF 9).



0981 ENC 100

RJ45/M12 adaptor, female receptacle connector M12, D coding, chassis side thread PG 9, RJ45 female connector, 90 degree.



0986 EFC 151 A

Receptacle connector, M12 female connector for front mounting, 4 poles, D coding, adjustable, assembled stranded wire, solder contacts potted with epoxy, chassis side thread M16 x 1.5.

