



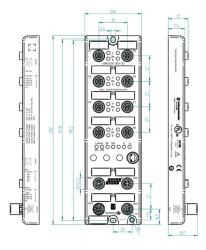
Product: <u>0980 ESL 303-121</u> ☐

LioN-P, PROFINET I/O Device, 8DI 8DO (8x M12), M12 L-coded Power Supply, Metal, 60 mm

Product Description

LioN-P, I/O Standalone, PROFINET, industrial metal housing, 60 mm, up to IP69K, 8 digital input and 8 digital output channels (2 A) with galvanic isolation, 8 x M12 A-coded I/O connection, 5-poles, 2 x M12 D-coded bus connection, 4-poles, 2 x M12 L-coded power supply connection, 5-poles

Technical Drawing



Technical Specifications

Product Description

Brand:	Belden
Product Family:	I/O Systems: Active - Standalone
Product Sub Family:	LioN-P
Item Description:	0980 ESL 303-121
Part Number:	934878003
Device Type:	I/O Module
Protocol:	PROFINET
I/O Function:	8DI 8DO
Bus Connection:	M12, 4-poles, D-coded
Power Connection (System Supply):	M12 Power, 5-poles, L-coded
I/O Connection:	M12, 5-poles, A-coded
I/O Type:	Digital Input and Digital Output

General Data

Housing Material:	Metal, Zinc Die-cast
Housing Plating:	Nickel, matt
Housing Color:	Grey Metallic
Protection Degree / IP Rating**:	IP65, IP67, IP69K
Potted:	Yes

Ambient Temperature (Operation)*: -20 °C to 70 °C Ambient Temperature (Storage/Transport): -25 °C to 85 °C Permissible Humidity (Operation): 5 % 95 % (For UL applications max. 80 %) Permissible Humidity (Storage/Transport): 5 % 95 % (For UL applications max. 80 %) Air Pressure (Operation): 80 kPa 106 kPa (up to 2000 m above sea level) Air Pressure (Storage/Transport): 80 kPa 106 kPa (up to 2000 m above sea level) Flammabilty Class: UL 94 (IEC 61010) Protection Class: UL 94 (IEC 61140, EN 61140, VDE 0140-1 Pollution Degree: 3 acc. to EN 60684-1, VDE 0110-1 Vibration Resistance: 15 g / 5 -500 Hz Shock Resistance: 50 g / 11ms Mean Time To Failure (MTTF): 692 years. acc. to Telcordia SR-332 (2011) 20°C Contact Base Material: M12, D-coded, CuSn, Gold-plated M12 Power, L-coded, CuNi, Gold-plated Contact Bearer Material: PA O-Ring Material: FKM Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (IVO Connection): M12: 0.5 Nm	Dimensions (W x H x D):	60 mm x 31 mm x 200 mm
Ambient Temperature (Storage/Transport): .25 °C to 85 °C Permissible Humidity (Operation): 5 % 95 % (For UL applications max. 80 %) Permissible Humidity (Storage/Transport): 5 % 95 % (For UL applications max. 80 %) Air Pressure (Operation): 80 kPa 106 kPa (up to 2000 m above sea level) Air Pressure (Storage/Transport): 80 kPa 106 kPa (up to 2000 m above sea level) Flammabilty Class: UL 94 (IEC 61010) Protection Class: III, IEC 61140, EN 61140, VDE 0140-1 Pollution Degree: 3 acc. to EN 60664-1, VDE 0110-1 Vibration Resistance: 15 g / 5 -500 Hz Shock Resistance: 50 g / 11ms Mean Time To Failure (MTTF): 692 years. acc. to Telcordia SR-332 (2011) 20°C Contact Base Material: M12, D-coded, CuSn, Gold-plated M12 Power, L-coded, CuNi, Gold-plated Contact Bearer Material: PA O-Ring Material: PA Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Weight:	500 g
Permissible Humidity (Operation): 5 % 95 % (For UL applications max. 80 %) Permissible Humidity (Storage/Transport): 5 % 95 % (For UL applications max. 80 %) Air Pressure (Operation): 80 kPa 106 kPa (up to 2000 m above sea level) Air Pressure (Storage/Transport): 80 kPa 106 kPa (up to 2000 m above sea level) Flammabity Class: UL 94 (IEC 61010) Protection Class: III, IEC 61140, EN 61140, VDE 0140-1 Pollution Degree: 3 acc. to EN 60664-1, VDE 0110-1 Vibration Resistance: 15 g / 5 -500 Hz Shock Resistance: 50 g / 11ms Mean Time To Failure (MTTF): 692 years. acc. to Telcordia SR-332 (2011) 20°C Contact Base Material: M12, D-coded, CuSn, Gold-plated M12 Power, L-coded, CuNi, Gold-plated Contact Bearer Material: PA O-Ring Material: FKM Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Ambient Temperature (Operation)*:	-20 °C to 70 °C
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Protection Class: III, IEC 61140, EN 61140, VDE 0140-1 Pollution Degree: 3 acc. to EN 60664-1, VDE 0110-1 Vibration Resistance: 15 g / 5 -500 Hz Shock Resistance: 50 g / 11ms Mean Time To Failure (MTTF): 692 years. acc. to Telcordia SR-332 (2011) 20°C Contact Base Material: M12, D-coded, CuSn, Gold-plated M12 Power, L-coded, CuNi, Gold-plated Contact Bearer Material: PA O-Ring Material: FKM Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection (FE)): M4: 1 Nm Fastening Torque (Bus Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Air Pressure (Storage/Transport):	80 kPa 106 kPa (up to 2000 m above sea level)
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Shock Resistance: 50 g / 11ms Mean Time To Failure (MTTF): 692 years. acc. to Telcordia SR-332 (2011) 20°C Contact Base Material: M12, D-coded, CuSn, Gold-plated M12 Power, L-coded, CuNi, Gold-plated Contact Bearer Material: PA O-Ring Material: FKM Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection (FE)): M4: 1 Nm Fastening Torque (Bus Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Pollution Degree:	3 acc. to EN 60664-1, VDE 0110-1
Mean Time To Failure (MTTF): 692 years. acc. to Telcordia SR-332 (2011) 20°C Contact Base Material: M12, D-coded, CuSn, Gold-plated M12 Power, L-coded, CuNi, Gold-plated Contact Bearer Material: PA O-Ring Material: FKM Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection (FE)): M4: 1 Nm Fastening Torque (Bus Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Vibration Resistance:	15 g / 5 -500 Hz
Contact Base Material: M12, D-coded, CuSn, Gold-plated M12 Power, L-coded, CuNi, Gold-plated Contact Bearer Material: PA O-Ring Material: FKM Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Shock Resistance:	50 g / 11ms
Contact Bearer Material: PA O-Ring Material: FKM Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection (FE)): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm M12: 0.5 Nm	Mean Time To Failure (MTTF):	692 years. acc. to Telcordia SR-332 (2011) 20°C
O-Ring Material: FKM Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection (FE)): M4: 1 Nm Fastening Torque (Bus Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Contact Base Material:	M12, D-coded, CuSn, Gold-plated M12 Power, L-coded, CuNi, Gold-plated
Mounting: 2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection (FE)): M4: 1 Nm Fastening Torque (Bus Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Contact Bearer Material:	PA
Fastening Torque (Fixing Screw): M4: 1 Nm Fastening Torque (Ground Connection (FE)): M4: 1 Nm Fastening Torque (Bus Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	O-Ring Material:	FKM
Fastening Torque (Ground Connection (FE)): M4: 1 Nm Fastening Torque (Bus Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Mounting:	2 hole screw mounting. Use standard M4 x 25 / 30 screws with toothed lock washer (as per DIN 125) and self-locking nuts.
Fastening Torque (Bus Connection): M12: 0.5 Nm Fastening Torque (Power Connection): M12: 0.5 Nm Fastening Torque (I/O Connection): M12: 0.5 Nm	Fastening Torque (Fixing Screw):	M4: 1 Nm
Fastening Torque (I/O Connection): M12: 0.5 Nm M12: 0.5 Nm M12: 0.5 Nm	Fastening Torque (Ground Connection (FE)):	M4: 1 Nm
Fastening Torque (I/O Connection): M12: 0.5 Nm	Fastening Torque (Bus Connection):	M12: 0.5 Nm
	Fastening Torque (Power Connection):	M12: 0.5 Nm
Included in Delivery: Attachable Labels: 15x, Sealing Caps: 5x M12	Fastening Torque (I/O Connection):	M12: 0.5 Nm
	Included in Delivery:	Attachable Labels: 15x, Sealing Caps: 5x M12

PROFINET

Protocol:PROFINETConnection:M12 LAN, 4-poles, D-codedNumber of Connections:2Specification:V2.3XConformance Class:CPerformance Class:RT (switch supports IRT)Netload Class:IIITransmission Rate:Fast Ethernet (10/100 Mbit/s), Full DuplexTransmission Method:100 BASE-TX, with auto negotiation and auto crossingCycle Time / Update Rate:min. 1 msAddressing:DCPFast Startup (FSU):Supported, ≤ 1000 msMedia Redundancy Protocol (MRP):Supported, MRP clientShared Device:Not Supported		
Number of Connections: 2 Specification: V2.3X Conformance Class: C Performance Class: RT (switch supports IRT) Netload Class: III Transmission Rate: Fast Ethernet (10/100 Mbit/s), Full Duplex Transmission Method: 100 BASE-TX, with auto negotiation and auto crossing Cycle Time / Update Rate: min. 1 ms Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Protocol:	PROFINET
Specification: V2.3X Conformance Class: C Performance Class: RT (switch supports IRT) Netload Class: III Transmission Rate: Fast Ethernet (10/100 Mbit/s), Full Duplex Transmission Method: 100 BASE-TX, with auto negotiation and auto crossing Cycle Time / Update Rate: min. 1 ms Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Connection:	M12 LAN, 4-poles, D-coded
Conformance Class: RT (switch supports IRT) Netload Class: III Transmission Rate: Fast Ethernet (10/100 Mbit/s), Full Duplex Transmission Method: 100 BASE-TX, with auto negotiation and auto crossing Cycle Time / Update Rate: min. 1 ms Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Number of Connections:	2
Performance Class: RT (switch supports IRT) Netload Class: III Transmission Rate: Fast Ethernet (10/100 Mbit/s), Full Duplex Transmission Method: 100 BASE-TX, with auto negotiation and auto crossing Cycle Time / Update Rate: min. 1 ms Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Specification:	V2.3X
Netload Class: III Transmission Rate: Fast Ethernet (10/100 Mbit/s), Full Duplex Transmission Method: 100 BASE-TX, with auto negotiation and auto crossing Cycle Time / Update Rate: min. 1 ms Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Conformance Class:	С
Transmission Rate: Fast Ethernet (10/100 Mbit/s), Full Duplex Transmission Method: 100 BASE-TX, with auto negotiation and auto crossing Cycle Time / Update Rate: min. 1 ms Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Performance Class:	RT (switch supports IRT)
Transmission Method: 100 BASE-TX, with auto negotiation and auto crossing Cycle Time / Update Rate: min. 1 ms Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Netload Class:	III
Cycle Time / Update Rate: min. 1 ms Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Transmission Rate:	Fast Ethernet (10/100 Mbit/s), Full Duplex
Addressing: DCP Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Transmission Method:	100 BASE-TX, with auto negotiation and auto crossing
Fast Startup (FSU): Supported, ≤ 1000 ms Media Redundancy Protocol (MRP): Supported, MRP client	Cycle Time / Update Rate:	min. 1 ms
Media Redundancy Protocol (MRP): Supported, MRP client	Addressing:	DCP
· · · · · ·	Fast Startup (FSU):	Supported, ≤ 1000 ms
Shared Device: Not Supported	Media Redundancy Protocol (MRP):	Supported, MRP client
	Shared Device:	Not Supported
Topology Detection: LLDP, SNMP V1	Topology Detection:	LLDP, SNMP V1
Easy Device Replacement: Supported, based on LLDP	Easy Device Replacement:	Supported, based on LLDP
Supported Network Protocols (Other): ARP, HTTP, Ping, SNMP V1, TCP/IP	Supported Network Protocols (Other):	ARP, HTTP, Ping, SNMP V1, TCP/IP

Power Supply

Connection Module Supply Voltage:	M12 Power, 5-poles, L-coded
Number of Connections:	2
Current Carrying Capacity of Connector:	max. 16 A
Module Supply Voltage (Nominal):	24 V DC (SELV/PELV)
Module Supply Voltage (Range):	18 V DC to 30 V DC
Current Consumption (typ.):	120 mA (at 24 V DC)
Reverse Polarity Protection:	Yes
Status Indicator (System Supply):	LED green
Diagnostic Indicator:	LED red
Connection Sensor Supply Voltage:	M12 Power, 5-poles, L-coded
Current Carrying Capacity of Connector:	max. 16 A
Sensor Supply Voltage (Nominal):	24 V DC (SELV/PELV)

Sensor Supply Voltage (Range):	18 V DC to 30 V DC
Reverse Polarity Protection:	Yes
Status Indicator (Sensor Supply):	LED green
Diagnostic Indicator:	LED red
Connection Actuator Supply Voltage:	via Module Supply Connection
Current Carrying Capacity of Connector:	max. 16 A
Actuator Supply Voltage (Nominal):	24 V DC (SELV/PELV)
Actuator Supply Voltage (Range):	18 V DC to 30 V DC
Reverse Polarity Protection:	Yes
Status Indicator (Actuator Supply):	LED green
Diagnostic Indicator:	LED red

Digital Input Channels

Number of Digital Input Channels:	max. 8, fixed
Connection:	M12, 5-poles, A-coded
Number of Ports:	4x, X1 to X4
Channel Type:	Type 3 acc. to IEC 61131-2
Input Wiring:	2-, 3-, 4-wire
Nominal Voltage:	24 V DC via US (module power supply)
Nominal Current:	typ. 5 mA
Sensor Current Supply:	max. 200 mA per port (at 30°C)
Sensor Type:	PNP
Input Voltage Range "0" signal:	-3 V DC+5 V DC
Input Voltage Range "1" signal:	11 V DC 30 V DC
Input Filter Time:	3 ms, fixed
Protective Circuit:	Electronicaly: Overload protection, short-circuit protection
Status Indicator (Inputs):	LED white or yellow per channel
Diagnostic Indicator:	LED red per port

Digital Output Channels

Number of Digital Output Channels:	max. 8, fixed
Connection:	M12, 5-poles, A-coded
Number of Ports:	4x, X5 to X8
Channel Type:	p-switching
Output Wiring:	2-, 3-wire
Nominal Voltage:	24 V DC via UL (actuator power supply)
Output Current per Channel:	max. 2 A
Output Current per Module:	max. 9 A
Galvanically Isolated:	Yes
Protective Circuit:	Electronicaly: Overload protection, short-circuit protection
Overload Behavior:	Manual restart
Status Indicator (Outputs):	LED white or yellow per channel
Diagnostic Idicator:	LED red per channel

Electrical Isolation

US (System Supply Voltage) / FE:	500 V DC
US / UL (Actuator Supply Voltage):	500 V DC
UL / FE:	500 V DC
Bus connection / FE:	2000 V DC

EMC Conformance

EMC Directive:	2014/30/EU
EN 61000-4-2 Electrostatic Discharge (ESD):	Criterion B; 4 kV contact discharge, 8 kV air discharge
EN 61000-4-3 Electromagnetic Field:	Criterion A; Field intensity: 10 V/m
EN 61000-4-4 Fast Transients (Burst):	Criterion B, 2 kV
EN 61000-4-5 Surge Voltage:	Criterion B; DC supply lines: $\pm 0.5 \text{ kV/} \pm 0.5 \text{ kV}$ (symmetrical/asymmetrical); For I/O ports with cables $\leq 30 \text{ m}$
EN 61000-4-6 Conducted immunity:	Criterion A; Test voltage 10 V

EN 55022 Radio Interference Properties:	Class A
LIV 33022 Madio interierence i roperties.	Old35 A

Safety & Environmental Compliance

CE:	Yes
RoHS Compliant:	Yes
China RoHS-Compliant:	Yes

Approvals

UL:	cULus Listed, UL 61010-1
UL-File:	E230848
CSA:	Yes, via UL
PNO:	Yes

Notes

Protection Degree / IP Rating Note:	** only if mounted and locked in combination with Hirschmann / Lumberg Automation connector.
System Power Supply Connection Note:	*do not connect / disconnect under voltage!
Update and Revision:	Revision Number: 0.82 Revision Date: 05-24-2023

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