



**Product:** [0980 XSL 3912-121-007D-00F](#) 

**LioN-X 8xIO-Link Class A with Multiprotocol**

## Product Description

LioN-X IO-Link Master, Multiprotocol (PROFINET, EtherNet/IP, EtherCAT, Modbus TCP), IoT Protocols (OPC UA, MQTT, CoAP, REST), 8 IO-Link Master Ports Class A, metal housing IP67, IP69K, 60mm, 8 x M12 A-coded I/O connection 5-poles, 2 x M12 D-coded Ethernet connection 4-poles, 2 x M12 L-coded power supply

## Technical Specifications

### Product Description

|                     |                                  |
|---------------------|----------------------------------|
| Brand:              | Belden                           |
| Product Family:     | I/O Systems: Active - Standalone |
| Product Sub Family: | LioN-X                           |
| Item Description:   | 0980 XSL 3912-121-007D-00F       |
| Part Number:        | 935700001                        |

### Product Life Cycle

|                                   |                                                            |
|-----------------------------------|------------------------------------------------------------|
| Device Type:                      | IO-Link Master                                             |
| Protocol:                         | Multiprotocol, PROFINET, EtherNet/IP, Modbus TCP, EtherCAT |
| I/O Function:                     | 8 IOL (Class A)                                            |
| 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:                         | IO-Link Master                                             |

### 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                                                                     |
| Dimensions (W x H x D):                   | 60 mm x 31 mm x 200 mm                                                  |
| Weight:                                   | 500 g                                                                   |
| Ambient Temperature (Operation)*:         | -40 °C to 70 °C                                                         |
| Ambient Temperature (Storage/Transport):  | -40 °C to 70 °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)                       |
| Flammability 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                                                             |
| Contact Base Material:                    | M12, D-coded, CuSn, Gold-plated   M12 Power, L-coded, CuNi, Gold-plated |

|                                            |                                                                                                                          |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Contact Bearer Material:                   | PA / TPU                                                                                                                 |
| 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                                                                                                              |
| Included in Delivery:                      | Attachable Labels: 15x, Sealing Caps: 5x M12                                                                             |
| Accessories to Order Separately:           | Ethernet cable, mounting adapter, sensor/actuator cable, power cable                                                     |

PROFINET

|                                      |                                                      |
|--------------------------------------|------------------------------------------------------|
| Protocol:                            | PROFINET                                             |
| Connection:                          | M12 4-poles, D-coded                                 |
| Number of Connections:               | 2                                                    |
| Specification:                       | V2.3                                                 |
| Conformance Class:                   | C (CC-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, ≤ 4000 ms                                 |
| Media Redundancy Protocol (MRP):     | Supported, MRP client                                |
| Shared Device:                       | Supported                                            |
| Shared Input:                        | not supported                                        |
| Topology Detection:                  | LLDP, SNMP V3                                        |
| Easy Device Replacement:             | Supported, based on LLDP                             |
| Supported Network Protocols (Other): | ARP, HTTP, Ping, SNMP V1, TCP/IP                     |

EtherNet/IP

|                                               |                                                      |
|-----------------------------------------------|------------------------------------------------------|
| Protocol (EtherNet/IP):                       | EtherNet/IP                                          |
| Connection:                                   | M12, 4-poles, D-coded                                |
| Number of Connections:                        | 2                                                    |
| Specification:                                | CIP V3.2x, EIP Adaption of CIP V1.2x                 |
| Transmission Rate:                            | Fast Ethernet (10/100 Mbit/s), Full Duplex           |
| Transmission Method:                          | 100 BASE-TX, with auto negotiation and auto crossing |
| Cycle Time / Requested Packet Interval (RPI): | min. 1 ms                                            |
| Addressing:                                   | BootP, DHCP, Rotary Address Switches                 |
| Address Switches Range:                       | 0 to 255 dec                                         |
| Connection Types:                             | Exclusive Owner, Input Only, Listen Only             |
| CIP Msg Connection Limit:                     | 6                                                    |
| CIP I/O Connection Limit:                     | 3                                                    |
| Device Level Ring (DLR):                      | Supported, beacon based                              |
| Quick Connect (QC):                           | Supported, ≤ 500 ms                                  |
| Supported Network Protocols (Other):          | ACD, ARP, BootP, DHCP, HTTP, IGMP, Ping, TCP/IP      |

EtherCAT

|                           |                                                      |
|---------------------------|------------------------------------------------------|
| Protocol:                 | EtherCAT                                             |
| Connection:               | M12 4-poles, D-coded                                 |
| Number of Connections:    | 2                                                    |
| Specification:            | ETG.1000 V1.2                                        |
| 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. 250 µs                                          |
| Addressing:               | Auto-increment addressing, fixed position addressing |

|                                      |                                                                                            |
|--------------------------------------|--------------------------------------------------------------------------------------------|
| Mailbox Protocols:                   | CANopen over EtherCAT (CoE), File access over EtherCAT (FoE), Ethernet over EtherCAT (EoE) |
| Supported Network Protocols (Other): | Over EoE: HTTP, Ping, TCP/IP                                                               |

Modbus TCP

|                              |                                       |
|------------------------------|---------------------------------------|
| Protocol:                    | Modbus TCP                            |
| Connection:                  | M12, 4-poles, D-coded                 |
| Number of Connections:       | 2                                     |
| Device Type:                 | Modbus Slave                          |
| Specification:               | Modbus application protocol V1.1b     |
| Supported Network Protocols: | SNMP V1, HTTP, TFTP, FTP, BootP, DHCP |

IIoT Protocols

|           |                                                    |
|-----------|----------------------------------------------------|
| OPC UA:   | Cyclic data read/write, Diagnosis data, Event data |
| MQTT:     | Cyclic data read/write, Diagnosis data, Event data |
| REST API: | Cyclic data read/write, Diagnosis data, Event data |
| CoAP:     | Cyclic data read/write, Diagnosis data, Event data |

Power Supply

|                                     |                             |
|-------------------------------------|-----------------------------|
| Connection Module Supply Voltage:   | M12 Power, 5-poles, L-coded |
| Number of Connections:              | 2                           |
| Module Supply Voltage (Nominal):    | 24 V DC (SELV/PELV)         |
| Module Supply Voltage (Range):      | 20V DC to 30 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 |
| Sensor Supply Voltage (Nominal):    | 24 V DC (SELV/PELV)         |
| Sensor Supply Voltage (Range):      | 20V DC to 30 V DC           |
| Reverse Polarity Protection:        | Yes                         |
| Status Indicator (Sensor Supply):   | LED green                   |
| Diagnostic Indicator:               | LED red                     |
| 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                     |

IO-Link Master Channels

|                                    |                                                            |
|------------------------------------|------------------------------------------------------------|
| Number of IO-Link Master Channels: | max. 8, configurable                                       |
| Connection:                        | M12, 5-poles, A-coded                                      |
| IO-Link Class A Ports:             | 8x, X1 to X8                                               |
| IO-Link Specification:             | V1.1.3                                                     |
| Parameter Storage:                 | Supported                                                  |
| Supported COM Modes:               | 4.8 kBaud (COM 1), 38.4 kBaud (COM 2), 230.4 kBaud (COM 3) |
| Cycle Time / Update Rate:          | min. 1 ms for all channels at 32 Byte IN / OUT             |
| Nominal Voltage:                   | 24 V DC via US (system power supply)                       |
| Nominal Current C/Q (Pin 4):       | 500mA                                                      |
| Nominal Current 1L+ (Pin 1):       | 4A                                                         |
| Perm. Conductor Length to Device:  | ≤ 20 m                                                     |
| Status Indicator (IOL):            | LED green per channel                                      |
| Diagnostic Indicator:              | LED red per port                                           |

Digital Input Channels

|                                   |                            |
|-----------------------------------|----------------------------|
| Number of Digital Input Channels: | up to 16                   |
| Connection:                       | M12, 5-poles, A-coded      |
| Number of Ports:                  | 8x, X1 to X8               |
| Channel Type:                     | Type 1 acc. to IEC 61131-2 |

|                                 |                                                               |
|---------------------------------|---------------------------------------------------------------|
| Input Wiring:                   | 2-, 3-, 4-wire                                                |
| Nominal Voltage:                | 24 V DC via US (module power supply)                          |
| Sensor Current Supply:          | max. 4A per port via Pin1L+                                   |
| Sensor Type:                    | PNP                                                           |
| Input Voltage Range "0" signal: | -3 V DC ...+5 V DC                                            |
| Input Voltage Range "1" signal: | 15 V DC ... 30 V DC                                           |
| Input Filter Time:              | configurable                                                  |
| Protective Circuit:             | Electronically: 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: | up to 16                                                      |
| Connection:                        | M12, 5-poles, A-coded                                         |
| Number of Ports:                   | 8x, X1 to X8                                                  |
| Channel Type:                      | p-switching                                                   |
| Output Wiring:                     | 2-, 3-wire                                                    |
| Nominal Voltage:                   | 24 V DC via US                                                |
| Output Current per Channel:        | max. 2 A                                                      |
| Output Current per Module:         | max. 16 A (for UL compliance: max 9A)                         |
| Galvanically Isolated:             | No                                                            |
| Protective Circuit:                | Electronically: Overload protection, short-circuit protection |
| Overload Behavior:                 | Auto off and on switching / Manual restart                    |
| Status Indicator (Outputs):        | LED white or yellow per channel                               |
| Diagnostic Idicator:               | LED red per port                                              |

### Electrical Isolation

|                                    |           |
|------------------------------------|-----------|
| US (System Supply Voltage) / FE:   | 500 V DC  |
| US / UL (Actuator Supply Voltage): | 500 V DC  |
| UL / FE:                           | 500 V DC  |
| Uaux / 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: $\pm 0.5$ kV/ $\pm 0.5$ kV (symmetrical/asymmetrical); For I/O ports with cables $\leq 30$ m |
| EN 61000-4-6 Conducted immunity:            | Criterion A; Test voltage 10 V                                                                                             |
| EN 55032 Radio Interference Properties:     | Class A                                                                                                                    |

### Safety & Environmental Compliance

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

### Approvals

|          |                          |
|----------|--------------------------|
| UL:      | cULus Listed, UL 61010-1 |
| CSA:     | Yes, via UL              |
| PNO:     | Yes                      |
| ODVA:    | Yes                      |
| ETG:     | Yes                      |
| IO-Link: | Yes                      |

### Notes

|                                      |                                                                 |
|--------------------------------------|-----------------------------------------------------------------|
| Protection Degree / IP Rating Note:  | *IP Rating test performed by Belden with Belden Connectors only |
| System Power Supply Connection Note: | *do not connect / disconnect under voltage!                     |

**Variants**

| Item #    | Item Description           |
|-----------|----------------------------|
| 935700001 | 0980 XSL 3912-121-007D-00F |

|                      |                                                  |
|----------------------|--------------------------------------------------|
| Update and Revision: | Revision Number: 0.143 Revision Date: 08-13-2024 |
|----------------------|--------------------------------------------------|

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