



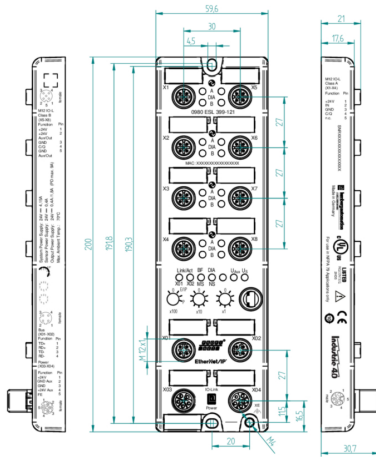
**Product:** [0980 ESL 399-121-S2](#)

LioN-P, Multiprotocol IO-Link Master, S2-Redundancy, 4DI 4DO 8IOL (8x M12), M12 L-coded Power Supply, Metal, 60 mm

**Product Description**

LioN-P, IO-Link Master, Multiprotocol (PROFINET and EtherNet/IP), S2-Redundancy, industrial metal housing, 60 mm, up to IP69K, 4 digital input and 4 digital output channels (2 A) with galvanic isolation and 8 IO-Link Master, 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 399-121-S2              |
| Part Number:        | 935021004                        |

**Product Life Cycle**

|                                   |                                       |
|-----------------------------------|---------------------------------------|
| Device Type:                      | IO-Link Master                        |
| Protocol:                         | Multiprotocol, PROFINET, EtherNet/IP  |
| I/O Function:                     | 4DI 4DO 8IOL                          |
| 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/ Digital Output/IO-Link |

**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)*:          | -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)                                                                        |
| 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                                                                                                              |
| Mean Time To Failure (MTTF):               | 582 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                                                                                                              |
| Included in Delivery:                      | Attachable Labels: 15x, Sealing Caps: 5x M12                                                                             |

PROFINET

|                                      |                                                      |
|--------------------------------------|------------------------------------------------------|
| Protocol:                            | PROFINET                                             |
| Connection:                          | M12 LAN, 4-poles, D-coded                            |
| Number of Connections:               | 2                                                    |
| Specification:                       | V2.35                                                |
| Conformance Class:                   | C                                                    |
| Performance Class:                   | RT (switch supports IRT)                             |
| Netload Class:                       | II                                                   |
| 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, ≤ 2000 ms                                 |
| Media Redundancy Protocol (MRP):     | Supported, MRP client                                |
| Shared Device:                       | Supported                                            |
| Topology Detection:                  | LLDP, SNMP V1                                        |
| 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 LAN, 4-poles, D-coded                            |
| Number of Connections:                        | 2                                                    |
| Specification:                                | CIP V3.1x, EIP Adaption of CIP V1.1x                 |
| 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):                  | Not supported                                   |
| Supported Network Protocols (Other): | ACD, ARP, BootP, DHCP, HTTP, IGMP, Ping, 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.):             | 180 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                      |

IO-Link Master Channels

|                                            |                                                            |
|--------------------------------------------|------------------------------------------------------------|
| Number of IO-Link Master Channels:         | max. 8, configurable                                       |
| Connection:                                | M12, 5-poles, A-coded                                      |
| IO-Link Class A Ports:                     | 4x, X1 to X4                                               |
| IO-Link Class B Ports:                     | 4x, X5 to X8                                               |
| IO-Link Specification:                     | V1.1.2                                                     |
| 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. 8 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):               | max. 500 mA (via US)                                       |
| Nominal Current 1L+ (Pin 1):               | max. 500 mA (via US)                                       |
| Nominal Current 2L+/Uaux (Pin 2, B Ports): | max. 2 A per port (via Uaux)                               |
| 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: | max. 12, configurable                |
| 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-wire                           |
| Nominal Voltage:                  | 24 V DC via US (module power supply) |
| Nominal Current:                  | typ. 3 mA                            |
| Sensor Current Supply:            | max. 500 mA per port via 1L+         |

|                                 |                                                               |
|---------------------------------|---------------------------------------------------------------|
| Sensor Type:                    | PNP                                                           |
| Input Voltage Range "0" signal: | -0,3V DC ... 5 V DC                                           |
| Input Voltage Range "1" signal: | 15 V DC ... 30 V DC                                           |
| 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: | max. 12, configurable                                                                          |
| Connection:                        | M12, 5-poles, A-coded                                                                          |
| Number of Ports:                   | 8x, X1 to X8                                                                                   |
| Channel Type:                      | p-switching                                                                                    |
| Output Wiring:                     | 2-wire                                                                                         |
| Nominal Voltage:                   | Pin 4: 24 V DC via US (system power supply) / Pin 2: 24 V DC via Uaux (auxiliary power supply) |
| Output Current per Channel:        | max. 2 A (Pin 2) / max. 0.5 A (Pin 4)                                                          |
| Output Current per Module:         | max. 9 A                                                                                       |
| Galvanically Isolated:             | Pin 4: No / Pin 2: Yes                                                                         |
| 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  |
| 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 55022 Radio Interference Properties:     | Class 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                      |
| ODVA:    | No                       |
| IO-Link: | 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!                                                |

Variants

| Item #    | Item Description    |
|-----------|---------------------|
| 935021004 | 0980 ESL 399-121-S2 |

|                      |                                                 |
|----------------------|-------------------------------------------------|
| Update and Revision: | Revision Number: 0.56 Revision Date: 11-14-2022 |
|----------------------|-------------------------------------------------|

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