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| Protection Degree / IP Rating**: | IP65, IP67, IP69K |
| Potted: | Yes |
| Dimensions (W x H x D): | 30 mm x 43 mm x 204 mm |
| Weight: | 450 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): | 612 years. acc. to Telcordia SR-332 (2011) 20°C |
| Contact Base Material: | M12 Hybrid, Y-coded, CuSn, 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

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| Protocol: | PROFINET |
| Connection: | M12 Hybrid, 8-poles, Y-coded |
| Number of Connections: | 2 |
| Specification: | V2.3X |
| 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

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| Protocol (EtherNet/IP): | EtherNet/IP |
| Connection: | M12 Hybrid, 8-poles, Y-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 |

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| 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

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| Connection Module Supply Voltage: | M12 Hybrid, 8-poles, Y-coded |
| Number of Connections: | 2 |
| Current Carrying Capacity of Connector: | max. 6 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. 6 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. 6 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

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| 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. 4 A per module (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

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| 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+ |

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| 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

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| Number of Digital Output Channels: | max. 8, configurable |
| Connection: | M12 5-poles, A-coded |
| Number of Ports: | 8x, X1 to X8 |
| Channel Type: | p-switching |
| Output Wiring: | 2-wire |
| Nominal Voltage: | 24 V DC via US (system power supply) |
| Output Current per Channel: | max. 0.5 A (Pin 4) |
| Output Current per Module: | max. 6 A |
| 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 Indicator: | LED red per port |

Electrical Isolation

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| US (System Supply Voltage) / FE: | 500 V DC |
| Uaux / FE: | 500 V DC |
| Bus connection / FE: | 2000 V DC |

EMC Conformance

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| 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: ± 0.5 kV/ ± 0.5 kV (symmetrical/asymmetrical); For I/O ports with cables ≤ 30 m |
| EN 61000-4-6 Conducted immunity: | Criterion A; Test voltage 10 V |
| EN 55022 Radio Interference Properties: | Class A |

Safety & Environmental Compliance

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

Approvals

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| UL: | cULus Listed, UL 61010-1 |
| UL-File: | E230848 |
| CSA: | Yes, via UL |
| IO-Link: | Yes |

Notes

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| 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 |
|-----------|------------------|
| 934964001 | 0980 ESL 199-331 |

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| Update and Revision: | Revision Number: 0.98 Revision Date: 03-04-2023 |
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