

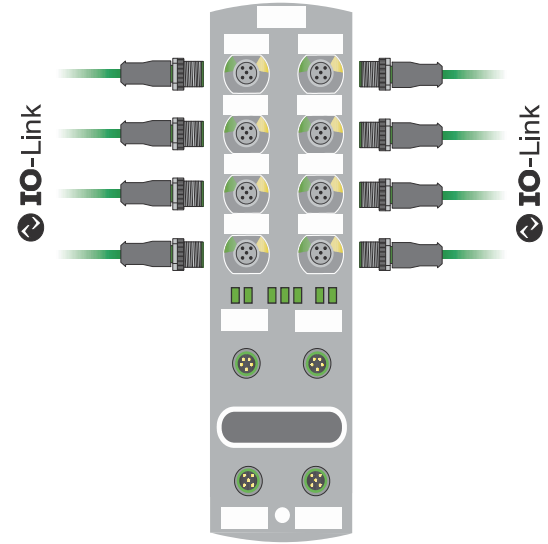
IO-Link Field I/O

IO-Link Overview

IO-Link is a standardized protocol that enables connection of intelligent devices (sensors and actuators) to an automation system.

Communication takes place between an IO-Link master and one or more IO-Link devices. IO-Link is a point-to-point communication system and is not a fieldbus. A master module has one or more ports and one device can be connected to each port.

The IO-Link master module is the interface between the controller and the IO-Link system, using EtherNet/IP or EtherCAT.



Features

- No field wiring is typically required. IO-Link devices plug into M12 ports.
- Rich sensor data can add diagnostics, history, and engineering units automatically, all delivered over one cable.
- Automatic device configuration can speed up and simplify field replacement.
- IO-Link Masters support daisy-chaining for easy installation of many devices.
- Premiere integration with Productivity PLC and BRX via EDS files

IO-Link Masters		
Part Number	Description	Price
<u>SIOL-EI8B</u>	STRIDE Basic EtherNet/IP IO-Link master, (8) IO-Link capable I/O points, up to (16) discrete I/O points, IO-Link v1.1, 8A, 1A/port, plastic housing, IP65 and IP67, -25 to 70 deg C.	\$05a48:
<u>54631</u>	Murrelektronik Premium EtherNet/IP IO-Link master, (8) IO-Link capable I/O points, up to (16) discrete I/O points, IO-Link v1.1, 16A, 2A/port, plastic housing, IP65 and IP67, -25 to 70 deg C.	\$05a49:
<u>54632</u>	Murrelektronik Premium EtherCAT IO-Link master, (8) IO-Link capable I/O points, up to (16) discrete I/O points, IO-Link v1.1, 16A, 2A/port, plastic housing, IP65 and IP67, -25 to 70 deg C.	\$,-06fdl:
<u>BNI008M</u>	Balluff EtherNet/IP IO-Link master, (8) IO-Link capable I/O points, up to (16) discrete I/O points, IO-Link v1.1.3, 9A, 2A/port, plastic housing, IP67, -5 to 70 deg C, multi-line LCD display.	\$,-06j[6:
<u>BNI00HM</u>	Balluff EtherNet/IP IO-Link master, (8) IO-Link capable I/O points, up to (16) discrete I/O points, IO-Link v1.1.3, 9A, 2A/port, die-cast zinc nickel-plated housing, IP67, -25 to 70 deg C.	\$,-06j[5:
<u>BNI006A</u>	Balluff EtherNet/IP IO-Link master, (8) IO-Link capable I/O points, up to (16) discrete I/O points, IO-Link v1.1.3, 9A, 2A/port, die-cast zinc nickel-plated housing, IP67, -5 to 70 deg C, multi-line LCD display.	\$,-06j[4:

IO-Link Hubs		
Part Number	Description	Price
<u>59507</u>	Murrelektronik IO-Link hub, up to (8) discrete I/O points, (8) 3-pin M8 ports, 24 VDC, IO-Link v1.1.2 (compatible with v1.1.3), IO-Link Class A Device, 4A, 0.5A/port, IP68. Requires IO-Link master.	\$05a4a:
<u>59710</u>	Murrelektronik IO-Link hub, up to (16) discrete input points, (8) 5-pin M12 A-coded ports, 24 VDC, IO-Link v1.1.2 (compatible with v1.1.3), IO-Link Class A Device, IP68. Requires IO-Link master.	\$05a4b:
<u>59712</u>	Murrelektronik IO-Link hub, up to (16) discrete I/O points, (8) 5-pin M12 A-coded ports, 24 VDC, IO-Link v1.1.2 (compatible with v1.1.3), IO-Link Class B Device, 4A, 2A/port, IP68. Requires IO-Link master.	\$,06fdn:
<u>59719</u>	Murrelektronik IO-Link hub, up to (16) discrete I/O points, (8) 5-pin M12 A-coded ports, 24 VDC, IO-Link v1.1.2 (compatible with v1.1.3), IO-Link Class A Device, 4A, 0.5A/port, IP68. Requires IO-Link master.	\$05a4c:
<u>59738</u>	Murrelektronik IO-Link hub, up to (16) discrete I/O points, (8) 5-pin M12 A-coded ports, 24 VDC, IO-Link v1.1.2 (compatible with v1.1.3), IO-Link Class A Device, 12A, 4A/port, IP68. Requires IO-Link master.	\$,06fdo:
<u>59840</u>	Murrelektronik IO-Link hub, up to (4) analog input channel(s), (4) 5-pin M12 A-coded port(s), current/voltage, 24-bit, IO-Link v1.1.2 (compatible with v1.1.3), IO-Link Class A Device, IP65, IP67 and IP68. Requires IO-Link master.	\$05zuz:
<u>59841</u>	Murrelektronik IO-Link hub, up to (4) temperature input channel(s), (4) 5-pin M12 A-coded port(s), RTD, 24-bit, IO-Link v1.1.2 (compatible with v1.1.3), IO-Link Class A Device, IP65, IP67 and IP68. Requires IO-Link master.	\$,06fdx:
<u>BNI00F4</u>	Balluff IO-Link hub, up to (16) discrete I/O points, up to (16) discrete input points, (8) 5-pin M12 A-coded ports, 24 VDC, IO-Link v1.1, IO-Link Class A Device, 4A, 0.2A/port, IP67. Requires IO-Link master.	\$,-06j[7:
<u>BNI00CP</u>	Balluff IO-Link hub, up to (16) discrete I/O points, up to (16) discrete input points, (8) 5-pin M12 A-coded ports, 24 VDC, IO-Link v1.1, IO-Link Class A Device, 9A, 2A/port, IP67. Requires IO-Link master.	\$,-06j[8:
<u>BNI00AJ</u>	Balluff temperature/analog IO-Link hub, up to (8) analog input channel(s), current/voltage/RTD/thermocouple, 16-bit, input RTD type(s): Pt100 and Pt1000, input thermocouple type(s): J, K, IO-Link v1.1, IP67. Requires IO-Link master.	\$,-06j[b:

IO-Link Signal Converters		
Part Number	Description	Price
<u>BNI00C6</u>	Balluff temperature/analog combo converter, 1-channel, current/voltage/RTD/thermocouple, 16-bit, input RTD type(s): Pt100 and Pt1000, input thermocouple type(s): J, K, IO-Link v1.1, stainless steel housing, IP65 and IP67. Requires IO-Link master.	\$,-06j[3:

IO-Link Masters

Features

- EtherNet/IP or EtherCAT Communication
- IP65 / IP67 rated
- Each port offers one dedicated digital I/O pin plus a second selectable pin for IO-Link, digital input or digital output.



SIOL-EI8B



54631



54632



IIoT Functions

Part Number	SIOL-EI8B	54631	54632*
Web Interface	Yes		
Energy monitoring	Yes, Current and voltage		
Temperature monitoring	Yes		
OPC UA	For IO-Link	No	Yes. Complies with Companion Specification Release 1.0 and Murrelektronik IO-Link diagnostic information model
	Transport	No	UA TCP, UA Secure Conversation, UA Binary Encoding
	Minimum release interval	No	100 ms
	Maximum sessions/clients	No	5
JSON	No	Yes, via REST API and MQTT	

*Requires an EtherCAT master with Ethernet over EtherCAT

Bus Data

Part Number	SIOL-EI8B	54631	54632
Fieldbus protocol	EtherNet/IP		EtherCAT
Transfer Rate	10/100 Mbit/s		100 Mbit/s
Addressing	BOOTP, DHCP, WebUI (Unsecure), Rotary encoder switch		Rotary encoder switch, EEPROM
Connection types	Exclusive Owner, Listen Only, Input Only		AoE, CoE, EoE, FoE
Device Level Ring (DLR)	Beacon-based		N/A
Connector	M12, 4-pin, D-coded		

IO-Link

IO-Link devices operating voltage	24VDC ---
IO-Link devices voltage range	20–30V
Transfer rate	4.8, 38.4 or 230.4 kbit/s
Standardized Master Interface (SMI)	IO-Link V1.1.3
Transfer rate recognition	Automatic

Supply

Operating voltage US	24VDC ---
Voltage range US	18–30V 20.3–30V when using IO-Link
Operating voltage UA	24V
Voltage range UA	18–30V
Sensor current US	≤16A at ≤40°C (see Derating)
Actuator current UA	≤16A at ≤40°C (see Derating)
Current consumption	≤0.18 A at idle
Connector	M12, 5-pin, L-coded
Conductor cross-section	Current per supply ≤12 A: #14 AWG Current per supply >12 A: #12 AWG

Materials

Part Number	SIOL-EI8B	54631	54632
Housing material	Plastic		

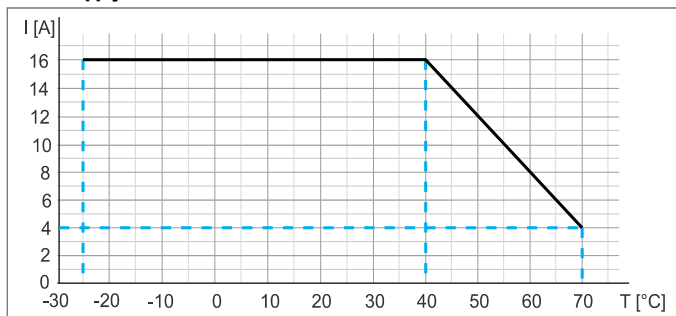
Assembly Data

Part Number	SIOL-EI8B	54631	54632
Weight (net)	470g [16.6 oz]		
Dimensions (L x W x H)	225.4 x 63 x 36 mm [8.874 x 2.5 x 1.4 in]		
Drawing	PDF	PDF	PDF

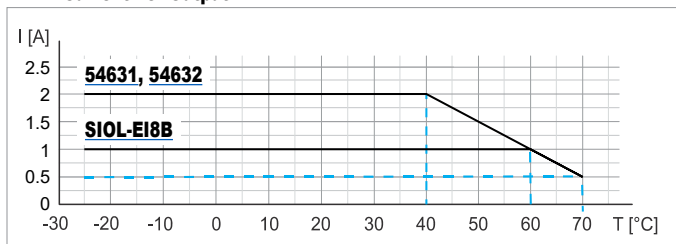
IO-Link Masters

Derating Charts

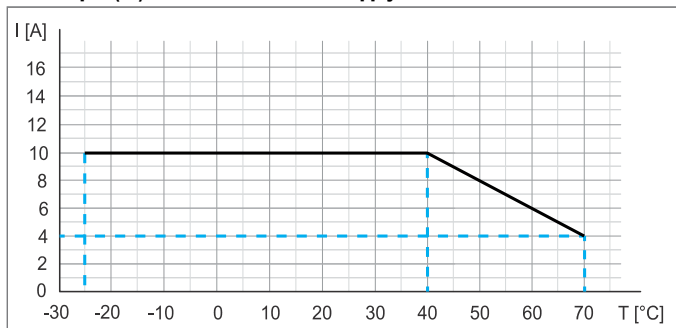
Supply Sensor Current US and Actuator Current UA



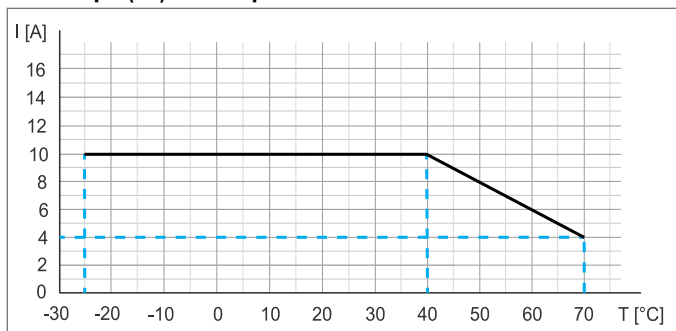
Current Per Sensor Power Supply
Current Per Output



Input (DI) Total Current Sensor Supply



Output (DO) Total Output Current



Input (DI)

Part Number	SIOL-EI8B	54631	54632
Sensor power supply (US) (see Derating)	≤1A load Automatic start, per port, at ≤60°C	≤2A load Automatic start, per port, at ≤40°C	
Total current sensor supply	≤10A at ≤40°C (see Derating)		
Filter time	0–15 ms + tcycle, adjustable		
Delay time for signal change	2–5 ms		
Input characteristic	EN 61131-2, Type 1 + Type 3		
Short-circuit protection, sensor supply	MOSFET with current measurement		
Connector	M12, 5-pin, A-coded		
Conductor cross-section	#18 AWG		
Conductor length	≤30m [98ft]		
Total current	≤2A per port	≤4A per port	

Output (DO)

Part Number	SIOL-EI8B	54631	54632
Output current DO (UA)	≤1A per channel at ≤60°C (see Derating)	≤2A per channel at ≤40°C (see Derating)	
Total output current	≤10A at ≤40°C (see Derating)		
Frequency	≤50 Hz		
Short-circuit protection actuator	MOSFET with current measurement		
Connector	M12, 5-pin, A-coded		
Conductor cross-section	#18 AWG		
Conductor length	≤30m [98ft]		
Total current	≤2A per port	≤4A per port	

Environmental

Operating temperature	-25°C to +70°C [-13°F to +158°F]
Storage & transport temperature	-25°C to +85°C [-13°F to +185°F] Provide acclimatization for commissioning
Relative humidity	≤95%
Installation altitude	≤3000m above sea level

Mechanical

Vibration test	EN 60068 Part 2-6: 10–58 Hz, Oscillation angle 0.35 mm, 58–150 Hz; 20 g
Shock test	EN 60068 Part 2-27: 50 g, duration 11 ms

Device Protection

Overvoltage protection	Yes
Overload protection module supply	Yes. To be ensured through load circuit monitoring
Reverse-polarity protection module supply US and UA	Yes
Short-circuit protection sensor supply	Electronically
Short-circuit protection output	Electronically
Protective circuit input	Suppressor diode, internal

Electrical Safety

Protection degree	EN 60529: IP67
Protection class	III, using a SELV- or PELV- power supply
Pollution degree	2

Electrical Interference


Radiated interference E-field enclosure	EN 55016-2-3
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EMC Immunity

Electrostatic discharge (ESD)	EN 61000-4-2
Electromagnetic RF fields	EN 61000-4-3
Fast transient burst	EN 61000-4-4
Surge AC	EN 61000-4-5
Conducted RF fields	EN 61000-4-6
Voltage dips	EN 61000-4-11

IO-Link Masters

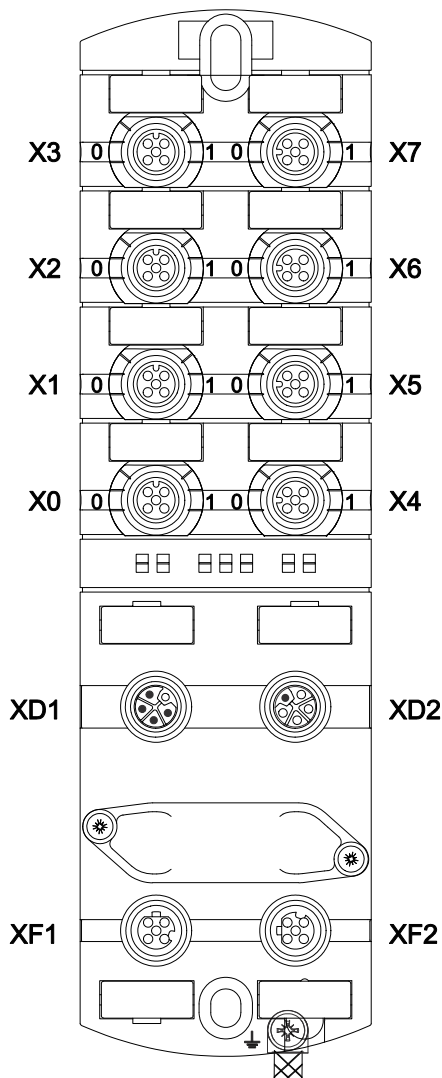
Conformity, Approvals	
Product standard	EN 61131-2, Programmable logic controllers
CE	2014/30/EU, 2011/65/EU
UKCA	Compliant
EMC	2014/30/EU
REACH	No. 1907/2006, SVHC List
WEEE	2012/19/EU, Category 5
cUL	CSA C22.2 NO. 61010-1, 3rd Ed., CSA C22.2 NO. 61010-2-201:18, 2nd Ed. E201820
ULus	UL 61010-1, 3rd Ed., UL 61010-2-201, 2nd Ed. E201820
China RoHS	GB/T 26572, 25 EPUP

Hazardous Substances		Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr (VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
	Part Name						
	Component part PCB	X	0	0	0	0	0
Connection Terminal/Screws		X	0	0	0	0	0

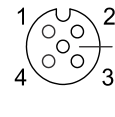
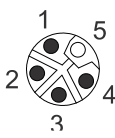
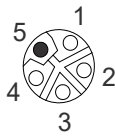
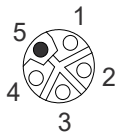

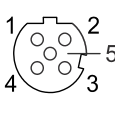
O: Indicates that the content of the harmful substance in all homogeneous materials of the component part is below the limit defined in GB/T 26572.

X: Indicates that the content of the harmful substance in at least one homogeneous material of the component part exceeds the limit defined in GB/T 26572.

Module Port Designations and Pinouts



Port Designations	
X0-X7	Digital inputs and outputs or IO-Link, M12, A-coded LED 0 corresponds to pin 4 LED 1 corresponds to pin 2
XD1	Power supply POWER IN, M12, L-coded, 5-pin
XD2	Power supply POWER OUT, M12, L-coded, 5-pin
XF1	Ethernet port 1, M12, D-coded
XF2	Ethernet port 2, M12, D-coded

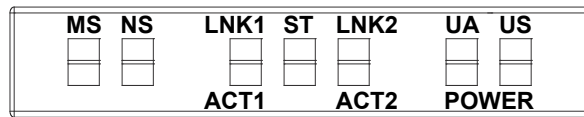
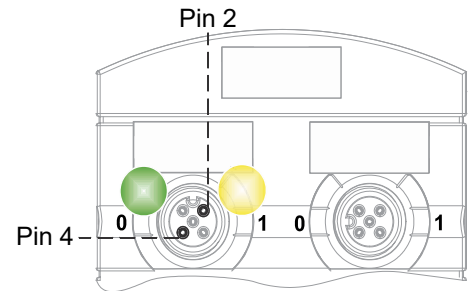
Pin Assignments	
X0-X7	M12 A-coded female connectors
	Pin 1 24VDC --- US
	Pin 2 DI/DO
	Pin 3 0V
	Pin 4 DI/DO/IO-Link
	Pin 5 0V
XD1	M12, L-coded, Power IN
	Pin 1 24VDC --- US (operating voltage)
	Pin 2 0V UA (actuator voltage)
	Pin 3 0V US
	Pin 4 24VDC --- UA
	Pin 5 
XD2	M12, L-coded, Power OUT
	Pin 1 24VDC --- US (operating voltage)
	Pin 2 0V UA (actuator voltage)
	Pin 3 0V US
	Pin 4 24VDC --- UA
	Pin 5 
XF1/XF2	M12 female connector, D-coded, Ethernet
	Pin 1 TD +
	Pin 2 RD +
	Pin 3 TD -
	Pin 4 RD -
	Pin 5 n.c.

IO-Link Masters

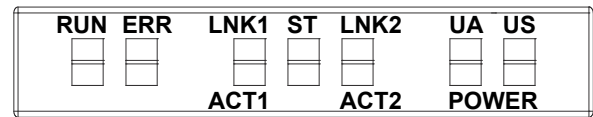
LED Indicators

The IO-Link master modules are equipped with the following separate LED indicators:

- an individual LED status indicator for each input and output pin
- NS (network status): indicates the state of the fieldbus system (models [SIOL-EI8B](#) and [54631](#))
- MS (module status): indicates the state of the module in the PLC configuration (models [SIOL-EI8B](#) and [54631](#))
- LNK/ACT (Link/Activity): indicate the state of EtherNet/IP or EtherCAT communications at each port
- RUN: indicates the device's operational mode (model [54632](#))
- ERR: indicates the device's error state (model [54632](#))
- ST: indicates the state of the overall module
- POWER UA: actuator voltage
- POWER US: operating voltage
- extended indications via blink patterns



[SIOL-EI8B, 54631](#)



[54632](#)

Web-based User Interface

The IO-Link master modules have a built-in web server for easy access to device status, configurations, and diagnostics.