

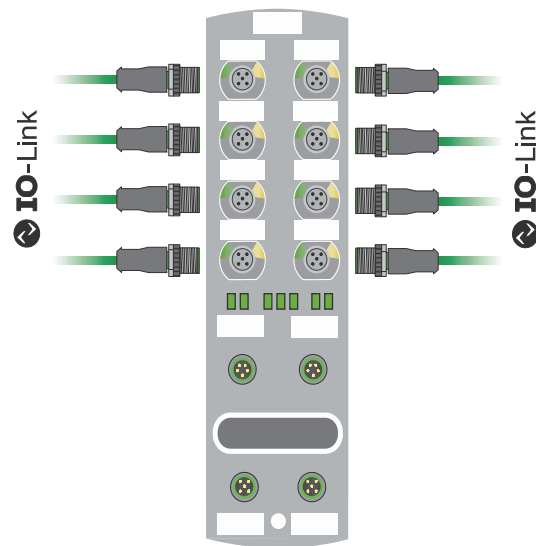
# IO-Link Field I/O

## 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
<a href="#"><b>SIOL-EI8B</b></a>	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.	\$290.00
<a href="#"><b>54631</b></a>	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.	\$385.00
<a href="#"><b>54632</b></a>	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.	\$399.00
<a href="#"><b>BNI008M</b></a>	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.	\$629.00
<a href="#"><b>BNI00HM</b></a>	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.	\$549.00
<a href="#"><b>BNI006A</b></a>	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.	\$669.00

IO-Link Hubs		
Part Number	Description	Price
<a href="#"><b>59507</b></a>	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.	\$195.00
<a href="#"><b>59710</b></a>	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.	\$180.00
<a href="#"><b>59712</b></a>	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.	\$215.00
<a href="#"><b>59719</b></a>	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.	\$215.00
<a href="#"><b>59738</b></a>	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.	\$301.00
<a href="#"><b>59840</b></a>	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.	\$229.00
<a href="#"><b>59841</b></a>	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.	\$219.00
<a href="#"><b>BNI00F4</b></a>	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.	\$291.00
<a href="#"><b>BNI00CP</b></a>	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.	\$349.00
<a href="#"><b>BNI00AJ</b></a>	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.	\$439.00

IO-Link Signal Converters		
Part Number	Description	Price
<a href="#"><b>BNI00C6</b></a>	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.	\$249.00

# 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		

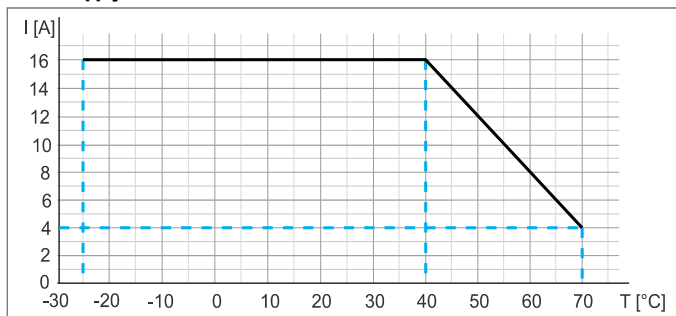
## Assembly Data

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	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>

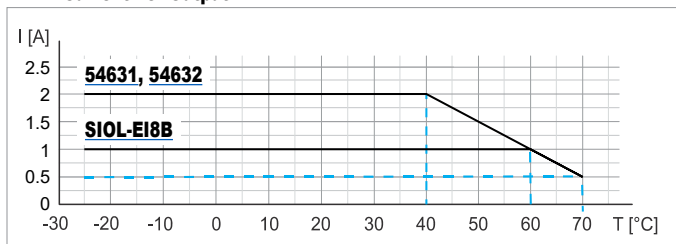
# IO-Link Masters

## Derating Charts

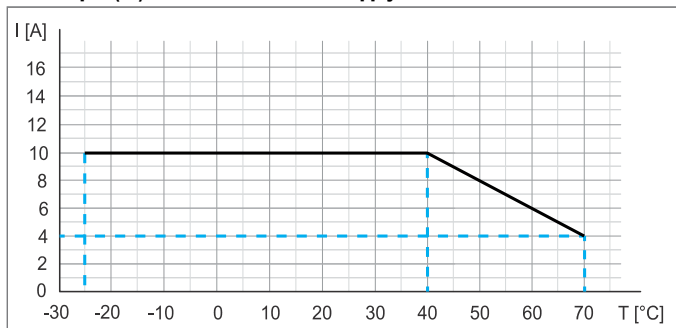
Supply Sensor Current US and Actuator Current UA



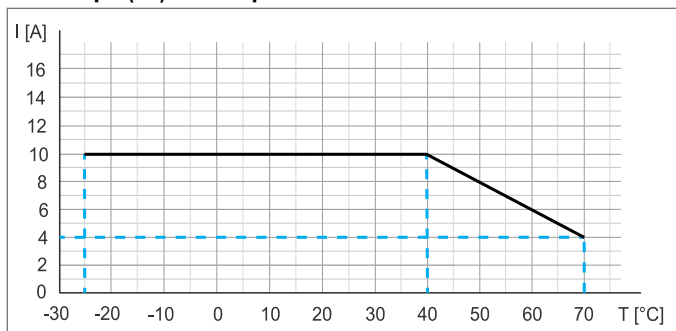
Current Per Sensor Power Supply  
Current Per Output



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

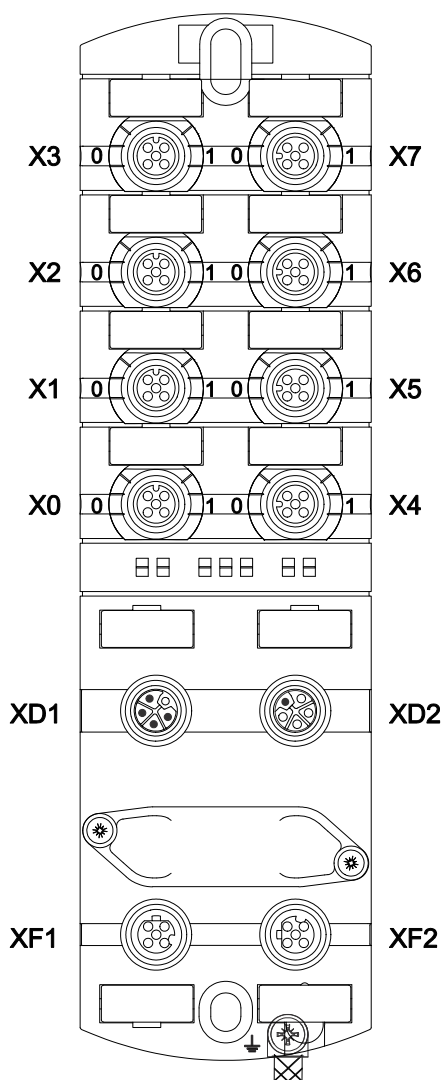
Conformity, Approvals	
<b>Product standard</b>	EN 61131-2, Programmable logic controllers
<b>CE</b>	2014/30/EU, 2011/65/EU
<b>UKCA</b>	Compliant
<b>EMC</b>	2014/30/EU
<b>REACH</b>	No. 1907/2006, SVHC List
<b>WEEE</b>	2012/19/EU, Category 5
<b>cUL</b>	CSA C22.2 NO. 61010-1, 3rd Ed., CSA C22.2 NO. 61010-2-201:18,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

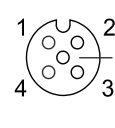
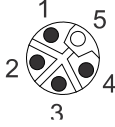
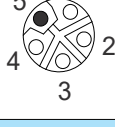
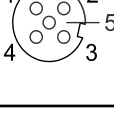
O: Indicates that the content of the harmful substance in all homogeneous materials of the component part is below the limit defined in GB/T 26572.

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

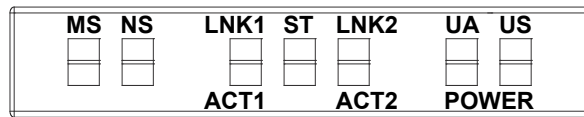
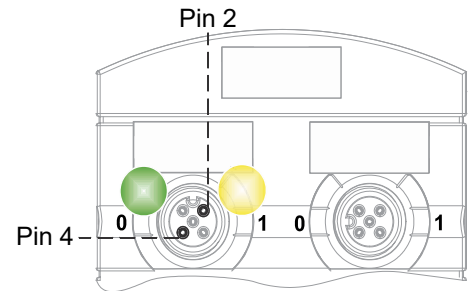
Pin Assignments	
<b>X0-X7</b>	<b>M12 A-coded female connectors</b>
	Pin 1 24VDC $\overline{\text{US}}$
	Pin 2 DI/DO
	Pin 3 0V
	Pin 4 DI/DO/IO-Link
	Pin 5 0V
<b>XD1</b>	<b>M12, L-coded, Power IN</b>
	Pin 1 24VDC $\overline{\text{US}}$ (operating voltage)
	Pin 2 0V UA (actuator voltage)
	Pin 3 0V US
	Pin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

# IO-Link Masters

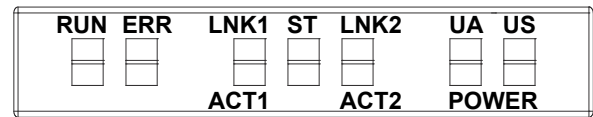
## LED Indicators

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.