

IO-LINK BLOCK

IOLB-8308

8-Point Digital Input/Output M8

User Guide



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Overview

IOLB-8308 Module Overview

The IOLB-8308 has eight digital points, each of which can be operated as an input or as an output and is connected to an IO-Link Master. Each point is configurable in that it can be used either as an input or output; the input circuit is internally connected to the output driver, so that a set output is displayed automatically in the input process image.

The outputs handle load currents of up to 0.5 A, and although the total current is limited to 4 A, they are short-circuit proof and protected against inverse polarity. The state of each signal is indicated by means of light emitting diodes. The signals are connected via M8 connectors.

The small IOLB-8308 form factor (H126 x W30 x D26.5 mm) means that they are suitable for use where space is at a premium. The small mass of the IOLB-8308 module facilitates applications with mobile I/O interface, for example, a robot arm.

The robust design of the IOLB-8308 module enables them to be used directly at the machine. Control cabinets and terminal boxes are now no longer required. The module is fully sealed and therefore ideally prepared for wet, dirty or dusty conditions (IP67).

Pre-assembled cables significantly simplify IO-Link and signal wiring. Very few wiring errors are made, so that commissioning is optimized. In addition to pre-assembled IO-Link, power and sensor cables, field-configurable connectors and cables are available for maximum flexibility. Sensors and actuators are connected through M8 connectors.

8 Digital In or Output (24VDC)

The IOLB-8308 has eight digital points, each of which can be operated as an input or as an output. You do not need to configure a point as input or output in software because the input circuit is internally connected to the output driver, so a set output is displayed automatically to the input process image.

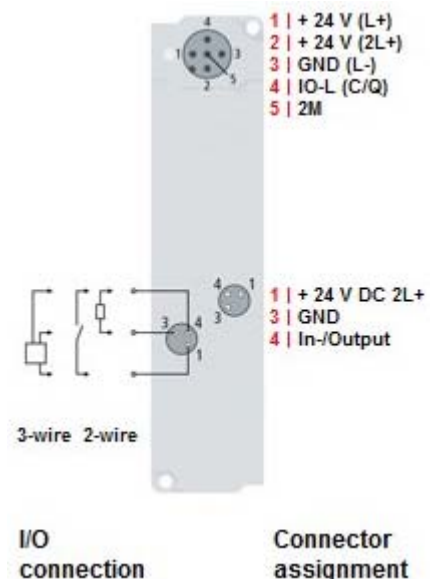
The outputs handle load currents of up to 0.5 A, are short-circuit proof and protected against inverse polarity.

The filter constant of the inputs is 3.0 ms.

The state of each signal is indicated with LEDs.


Note: The connected sensors are powered via 2L+, not from L+. The IOLB-8308 supplies digital sensors in contrast to many other modules from the additional supply voltage 2L+, not from the voltage L+. This happens because the connectors can be used alternatively as input or as output. If an overload of the sensor supply (current > 0.5 A) occurs, the 24V LED is red.


If the 2L+ supply power of the IOLB-8308 is switched through an E-Stop or similar circuit safety circuit – **DO NOT** externally power any of the devices connected to the IOLB-8308 since they could supply power to the IOLB-8308 and the outputs of the IOLB-8308 could still be powered even after 2L+ is de-energized.



IOLB-8308 LEDs

This subsection provides information about the IOLB-8308 LEDs.

X1 (IO-Link LED) 	Description
Off	IO-Link communications not active.
Flashing green (1 Hz)	IO-Link communications active.
Lit (Red)	Short circuit on C / Q line or overheating.

Power Supply LEDs 		Description
24V (L+)	Off	Voltage L+ Unavailable
	Green	Voltage L+ Ok
	Red	Voltage L+ Too Low

IOLB-8308 Technical Specifications

IOLB-8308 Technical Specifications	
Communication	IO-Link
Data transfer rate	230.4 KBaud (COM3)
IO-Link connection	1 x M8 connector, A-coded
Specification version	IO-Link V1.1, Class B
Requirements IO-Link Master	V1.1
Number of outputs	0 to 8
Output connector	M8
Load type	Ohmic, inductive, lamp load
Rated output voltage	24VDC (-15%/+20%)
Output current	Max. 0.5 A each point
Short circuit current	Max. 1.5 A
Module electronic current consumption	Typically 100 mA from L+
Output driver current consumption	Typically 20 mA
Module electronic supply	L+
Output driver supply	2L+ (Port Class B wiring)
Number of inputs	0 to 8
Input connections	M8
Nominal input voltage	24VDC (-15%/+20%)
Input filter (adjustable)	3.0 ms (default), adjustable between 0 ms and 20 ms
Input signal extension time (adjustable)	0 ms (default), adjustable between 0 ms and 100 ms
"0" signal voltage	-3...+5 V (EN 61131-2, Type 3)
"1" signal voltage	+11...+30 V (EN 61131-2, Type 3)
Input current	Typically 3 mA (EN 61131-2, Type 3)
Sensor supply	U _{S1} (derived from L+)
Process image	8 input bits, 8 output bits
Permissible ambient temperature during operation	
Note: To meet the UL requirements, the IOLB-8308 has to be operated only at an ambient temperature range of 0 to 55°C!	-25°C to +60°C

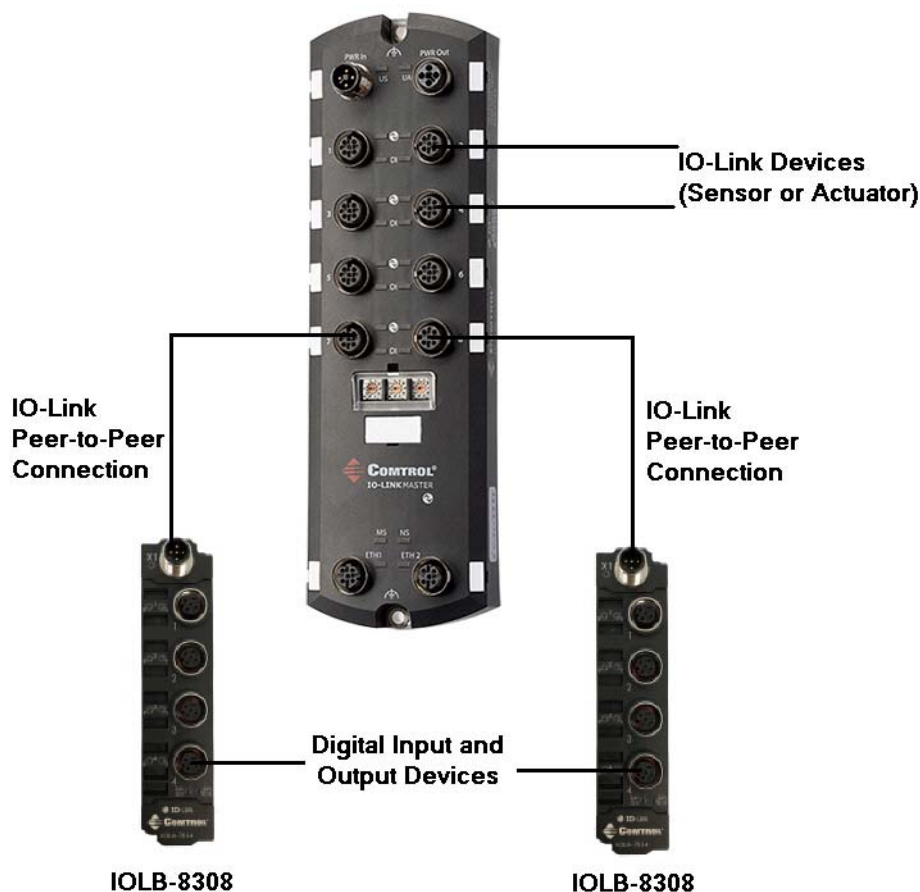
IOLB-8308 Technical Specifications	
Permissible ambient temperature during storage	-40°C to +85°C
Vibration / shock resistance	Conforms to EN 60068-2-6 / EN 60068-2-27
EMC resistance/emission	Conforms to EN 61000-6-2 / EN 61000-6-4
Protection class	IP65, IP66, IP67 (conforms to EN 60529)

IO-Link Basics

IO-Link is a communications system for connecting intelligent sensors and actuators to an automation system in IEC 61131-9 under the name *Single-drop digital communication interface for small sensors and actuators* (SDCI). Both the electrical connection data and the communication protocol are standardized and in the IO-Link specification summarized.

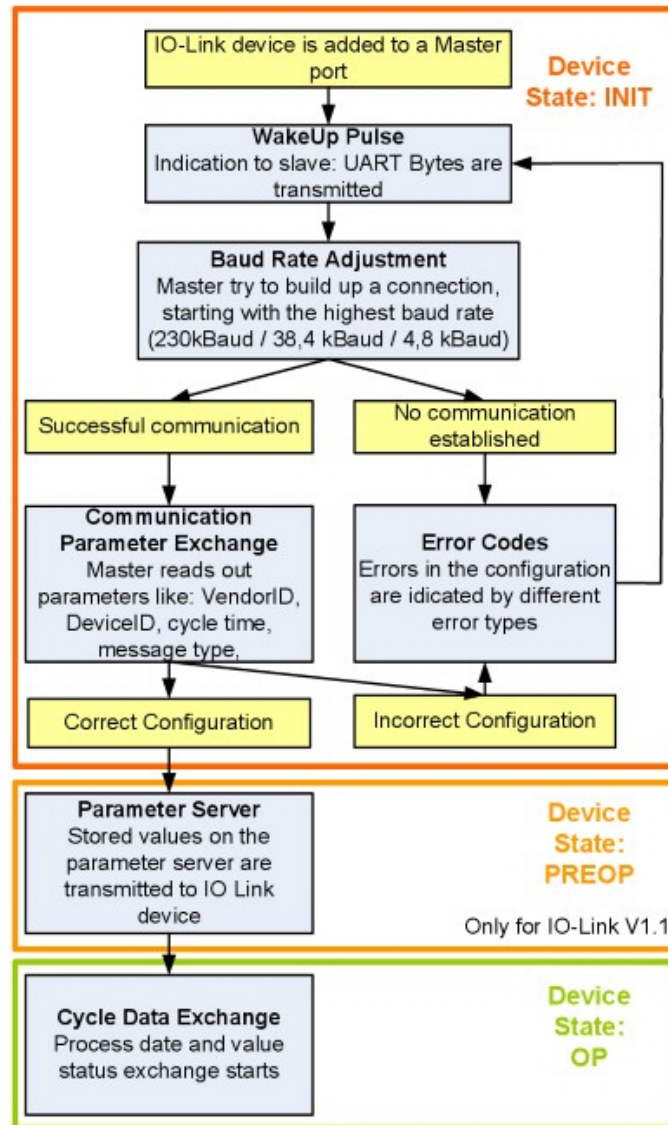
The IOLB-8308 meets the IO-Link specification 1.1. The IO-Link specification is included in the IEC standards and is accepted as IEC 61131-9 in an extended form. In this case, the new designation voltage SDCI is introduced.

An IO-Link system consists of an IO-Link Master, one or more IO-Link devices and sensors or actuators. The IO-Link Master provides the interface to the higher-level controller and controls the communication with the connected IO-Link devices. The Control IO-Link Master series has four or eight IO-Link ports at which each one IO-Link device can be connected. Therefore, IO-Link is not a fieldbus, but rather is a peer-to-peer connection as shown in the figure below.



The connected IO-Link devices have individual parameter information detected during automatic scanning with the Control IO-Link Master. Refer to [Configuring the IOLB-8308](#) on Page 19 for more information.

The structure of the IO-Link communication is shown in the following figure. In particular, this represents the sequence in the automatic scanning of the IO-Link ports.



The Pre-operate State occurs if the IO-Link device is v1.1 and if Data Storage is enabled then the device parameters are uploaded or downloaded.

Hardware Installation

This section provides installation information for the IOLB-8308.

Mounting the IOLB-8308

The following table provides information that you may require for installation.

IOLB-8308	
Housing material	PA6 (polyamide)
Casting compound	Polyurethane
Mounting	two fastening holes Ø 3 mm for M3
Metal parts	Brass, nickel-plated
Contacts	CuZn, gold-plated
Power feed through (maximum)	4 A
Installation position	Any
Protection class	IP65, IP66, IP67 (conforms to EN 60529)
Dimensions (H x W x D)	126 x 30 x 26.5 mm
Weight	Approximately 125 g

Note: While mounting the IOLB-8308, protect all connectors against contamination. All connectors must have either a cable or plug to guarantee IP67 rating.

Keep the following in mind when mounting the IOLB-8308.

- Mount the IOLB-8308 with two M3 bolts.
- The bolts must be longer than 15 mm. The fixing holes of the modules are not threaded.
- When assembling, remember that the connectors increases the overall height.

Connecting the IOLB-8308

Use the appropriate procedure to connect the IOLB-8308 to an IO-Link Master.

- [Installation With an IP67 Class A IO-Link Master](#) on Page 13
- [Installation With a Class A IP20 IO-Link Master](#) on Page 16

IOLB-8308 Power Supply Requirements

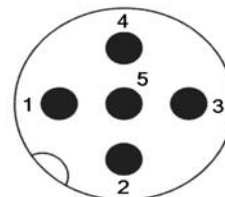
The power supply and safety circuit that you connect to the IOLB-8308 must meet the following requirements:

- 24VDC supplied by an isolating source and protected by means of a fuse (in accordance with UL248), rated maximum 4A or a 24VDC power source that satisfies NEC Class 2.
- A NEC Class 2 power supply shall not be connected in series or parallel with another (Class 2) power source.
- To meet the UL requirements, the IOLB-8308 must not be connected to unlimited power sources!

Note: To meet the UL requirements, the IOLB-8308 must not be connected to telecommunications networks and must be operated at the ambient temperature range specified in the specifications.

For additional information, see [IOLB-8308 Technical Specifications](#) on Page 7.

Pin	Input - Male
1	24V (L+) - electronics power
2	24V (L2+) - sensor or device power
3	GND (L-)
4	IO-Link (C/Q)
5	GND (2M)



The connected sensors are powered via 2L+, not from L+. The IOLB-8308 supplies digital sensors in contrast to many other modules from the additional supply voltage 2L+, not from the voltage L+. This happens because the connectors can be used alternatively as input or as output. If an overload of the sensor supply (current > 0.5 A) occurs, the 24V LED is red.

If the 2L+ supply power of the IOLB-8308 is switched through an E-Stop or similar circuit safety circuit – **DO NOT** externally power any of the devices connected to the IOLB-8308 since they could supply power to the IOLB-8308 and the outputs of the IOLB-8308 could still be powered even after 2L+ is de-energized.

The following Control cables and M12 Y-splitter can be used to connect the IOLB-8308 to the Class A IP67 IO-Link Master models.

Control Part Number	Description
1200143	Y Splitter, M12 5-poles, A-Coded, M to 2F
Varies by length†	Sensor cable, M12 5-poles, A-coded, M to F
Varies by length†	Power Cable, Control IOLB, M12 A-Coded, M to wires
† Contact Control Sales for the part number.	

Note: It is recommended to pull the M12 connectors tight with a nut torque of 0.6 Nm.

Installation With an IP67 Class A IO-Link Master

Use the following procedure to connect the IOLB-8308 to a Class A IP67 IO-Link Master.

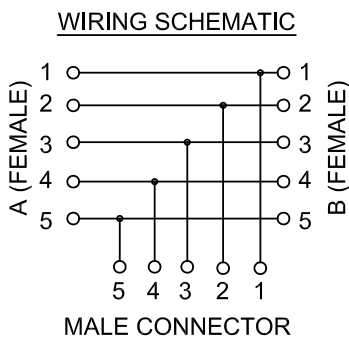
The images in this subsection shows connecting the 8-port IP67 model. Please note that the same procedures work for the 4-port model.

Note: This procedure assumes that the IO-Link Master is powered on, connected to the network and the IP address has been programmed for your environment.

1. Connect the M12 Y splitter to an available Control IO-Link Master IO-Link port.

This image shows:

- IO-Link sensor cable connected between the IO-Link Master port and the Y Splitter (1200143).
- Y Splitters connected directly to Ports 4 and 5.



Note: In the next step, make sure that the 24V power supply or switched through an E-Stop or similar circuit safety circuit is not energized during the wiring.

2. Connect the white and green wires of the Control IOLB power cable to a U_a power source.
 - a. Connect the white wire to the positive 24V terminal.
 - b. Connect the green wire to the negative 24V terminal.
3. Connect the M12 connector end of the Control IOLB power cable to Port B on the Y-Splitter.



Note: Connectors A and B are interchangeable on the Y Splitter.



4. Connect the 5-pole (M12) sensor cable between Port A on the Y-splitter and the IOLB-8308 IO-Link Port X1.



5. Apply power to the U_a power source connected to the IOLB-8308.

6. Verify that the following LEDs are lit:

- Green 24V (L+) and 24V (2L+) LEDs on the IOLB-8308
- Green IO-Link on the Control IO-Link Master is lit
- Amber DI LED on the Control IO-Link Master flickers because power is being injected into the DI pin to power the IOLB-8308.

Note: Refer to [IOLB-8308 LEDs](#) on Page 6 for detailed LED information.



Installation With a Class A IP20 IO-Link Master

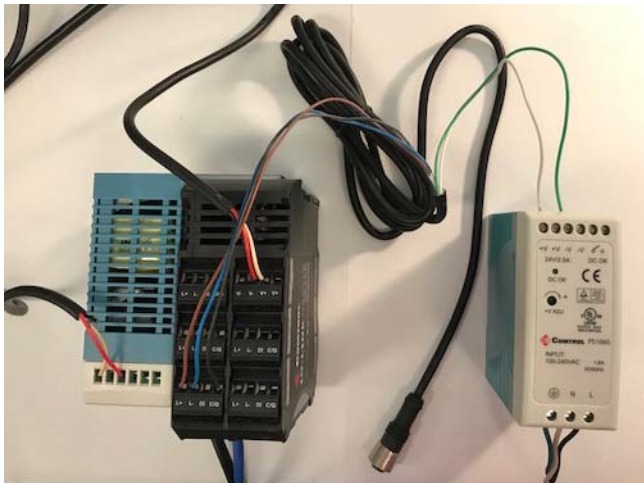
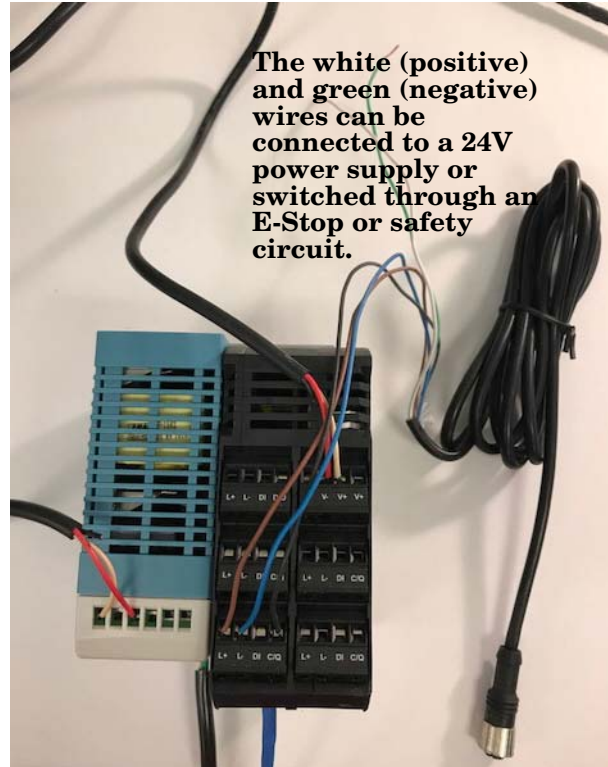
Use the following procedure to connect the IOLB-8308 to a Class A IP20 (DIN rail model) IO-Link Master.

Note: This procedure assumes that the IO-Link Master is powered on, connected to the network and the IP address has been programmed for your environment.

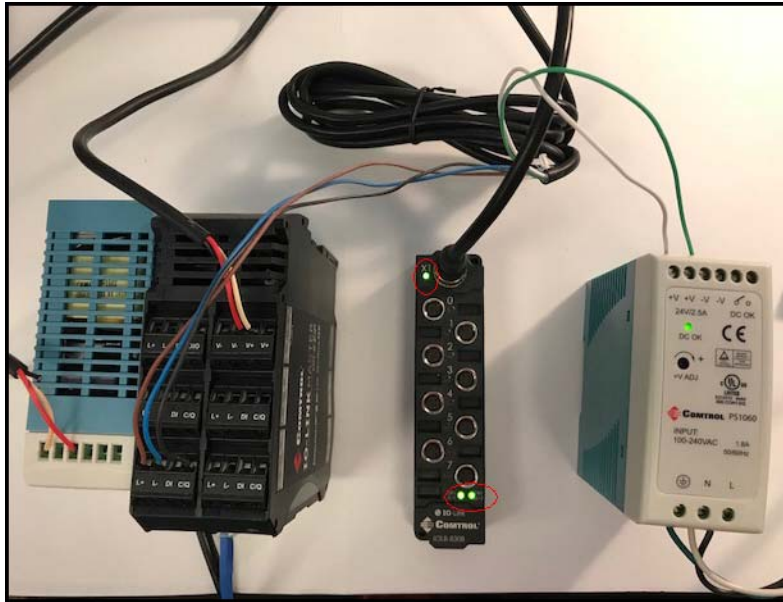
1. Connect a M8 A-coded to bare wire cable to the IO-Link Master:
 - Black to C/Q
 - Blue to L-
 - Brown to L+

Note: In the next step, make sure that the 24V power supply or switched through an E-Stop or similar circuit safety circuit is not energized during the wiring.

2. Connect the white and green wires of the IO-Link cable to a U_a power source. The image below illustrates connecting to a power supply.
 - c. Connect the white wire to the positive 24V terminal.
 - d. Connect the green wire to the negative 24V terminal.
 - e. Apply power to the U_a power source.



3. Connect the M8 connector from the IO-Link Master to the IOLB-8308 X1 connector.



4. Verify that the following LEDs are lit:
- Green 24V (L+) and 24V (2L+) LEDs on the IOLB-8308
 - Green IO-Link on the Control IO-Link Master is lit

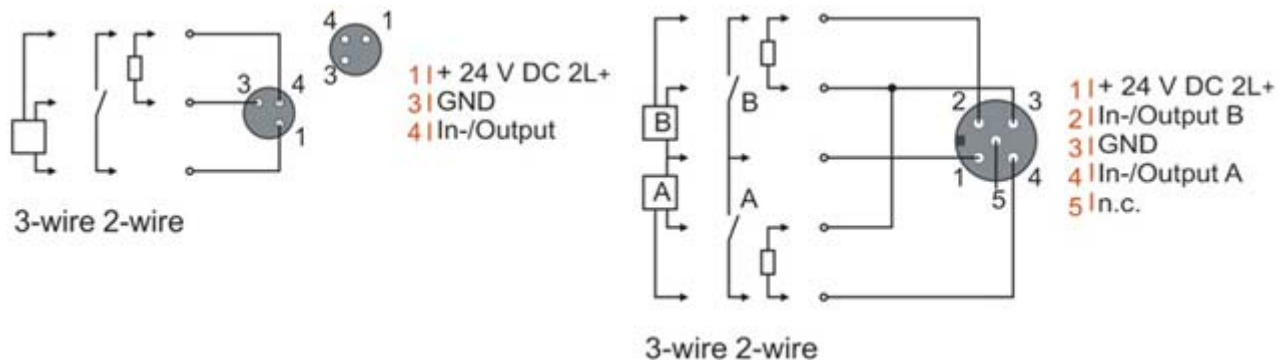
Note: Refer to [IOLB-8308 LEDs](#) on Page 6 for detailed LED information.

Digital In-/Outputs (M8)

Each of the points of the IOLB-8308 optionally operated as an input or as an output.

The digital inputs acquire the binary control signals from the process level and transmit them to the higher-level automation unit. The digital outputs connect the binary control signals from the automation unit on to the actuators at the process level.

The signals are connected via screw-in M8 connectors. The inputs/outputs indicate their status through light emitting diodes.




The outputs are protected against short-circuits and the inputs are protected against reverse voltage.

Control IO-Link Master Diagnostic Page

You can also verify the IOLB-8308 operation by viewing the Control IO-Link Master **IO-Link Diagnostics** page.

- 1. Log into the Control IO-Link Master using the IP address.
- 2. Click **Diagnostics | IO-Link**.

HomeDiagnosticsConfigurationAdvancedAttached DevicesHelpIO-Link Master 8-PNIOLogout

IO-LINKPROFINET IOMODBUS/TCP

IO-Link Diagnostics 

UPDATE

STOP LIVE UPDATES

RESET STATISTICS

This image does not display the complete Diagnostics page

IO-LINK PORT STATUS	PORT 1								
Port Name	IO-Link Port 1								
Port Mode	IOLink								
Port Status	Operational, PDI Valid								
IOLink State	Operate								
Device Vendor Name	Control Corporation								
Device Product Name	Control IOLB-8308								
Device Serial Number	9655-000005								
Device Hardware Version	00								
Device Firmware Version	03								
Device IO-Link Version	1.1								
Actual Cycle Time	4.0ms								
Device Minimum Cycle Time	0.5ms								
Configured Minimum Cycle Time	4ms								
Data Storage Capable	Yes								
Automatic Data Storage Configuration	Disabled								
Auxiliary Input (AI) Bit Status	Off								
Device PDI Data Length	1								
PDI Data Valid	Yes								
Last Rx PDI Data (MS Byte First)	00								

Welcome Admin

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Configuring the IOLB-8308

This section discusses loading the IODD on the Control IO-Link Master.

Locating the IOLB-8308 IODD Files

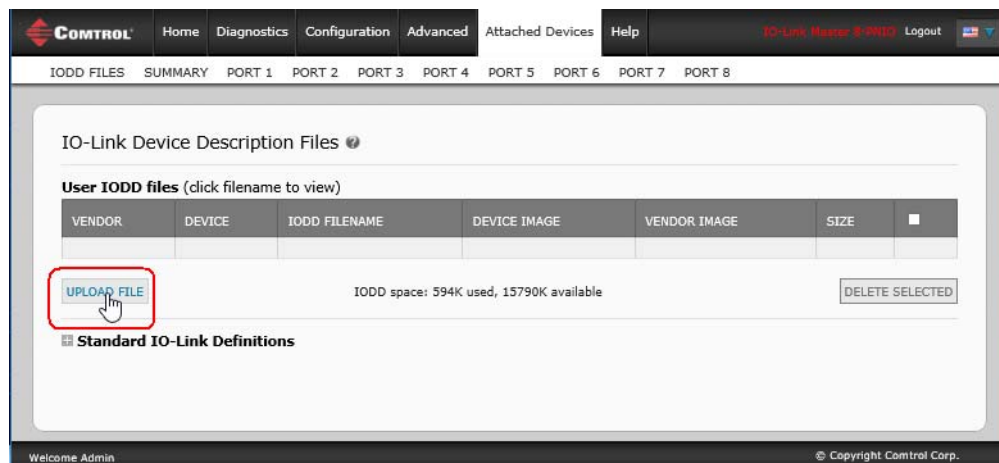
The IOLB-8308 IODD files are located on the Control download site using one of these addresses:

- http://downloads.control.com/IO_Link_Block/IOLB-8308/IODD/
- ftp://ftp.control.com/IO_Link_Block/IOLB-8308/IODD/

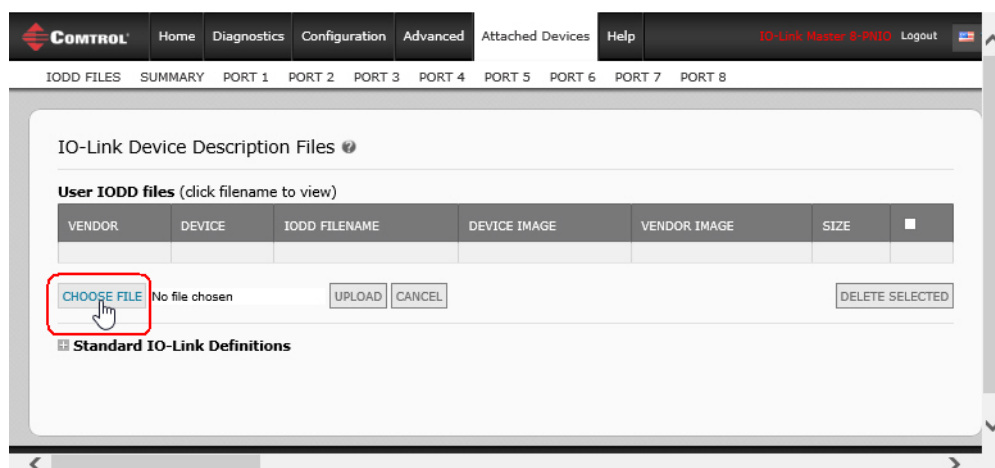
Loading the IODD Files Onto the Control IO-Link Master

Use the following procedure to load the IOLB-8308 IODD file.

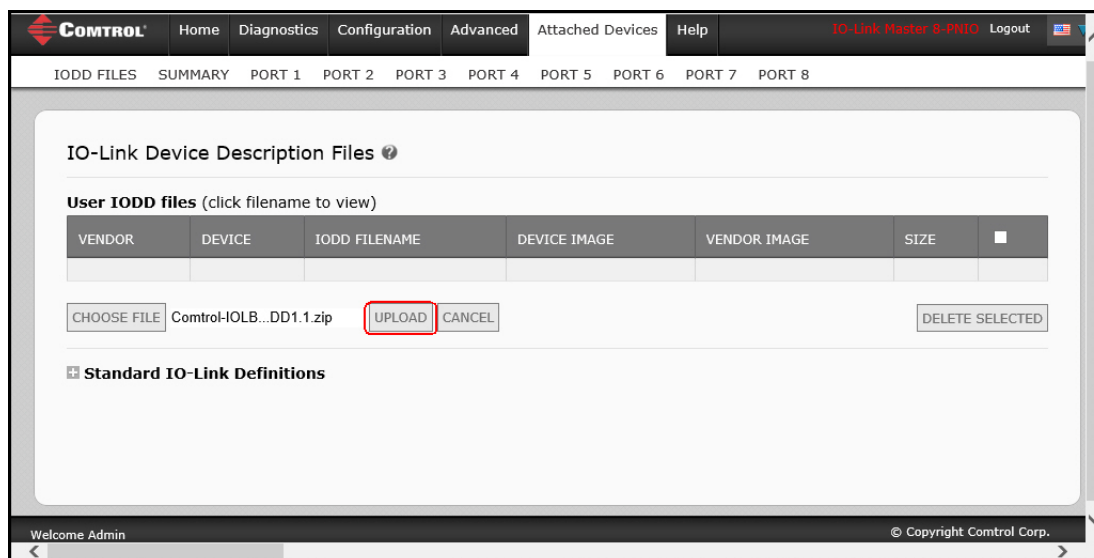
1. If necessary, download the IOLB-8308 IODD files.
2. Log into the Control IO-Link Master using the IP address.
3. Click **Attached Devices**.
4. Click the **UPLOAD FILE** button.



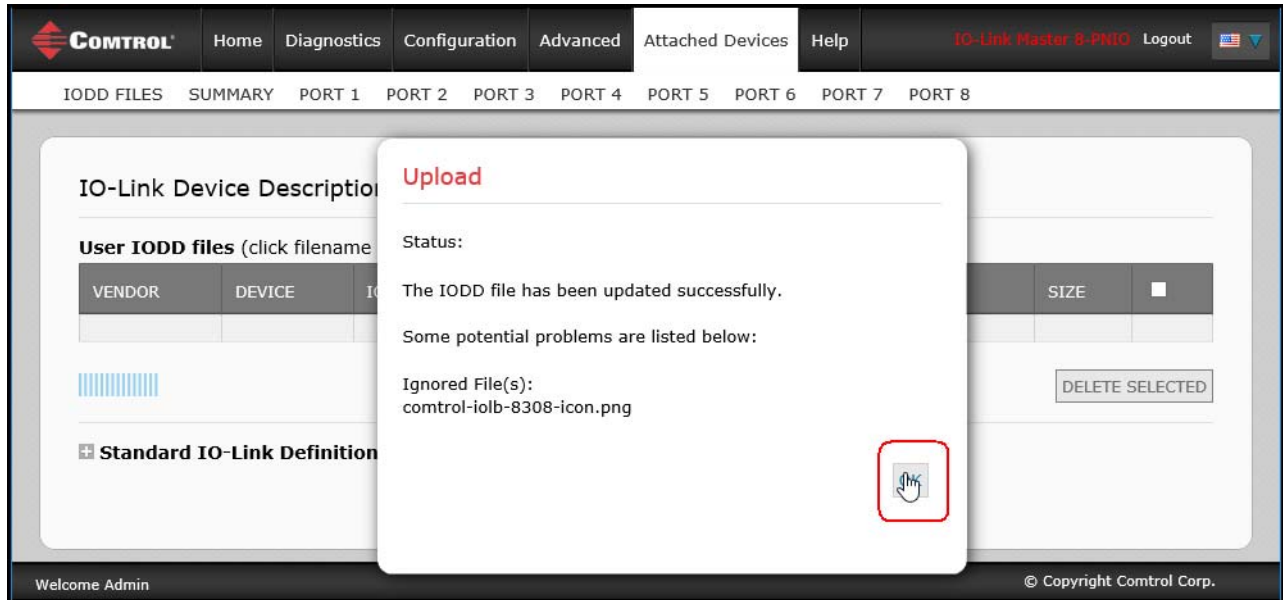
- Click the **CHOOSE FILE** button.



- Browse to and select the **Control-IOLB-8308-20180612-IODD1.1.zip** file.
- Click the **UPLOAD** button.

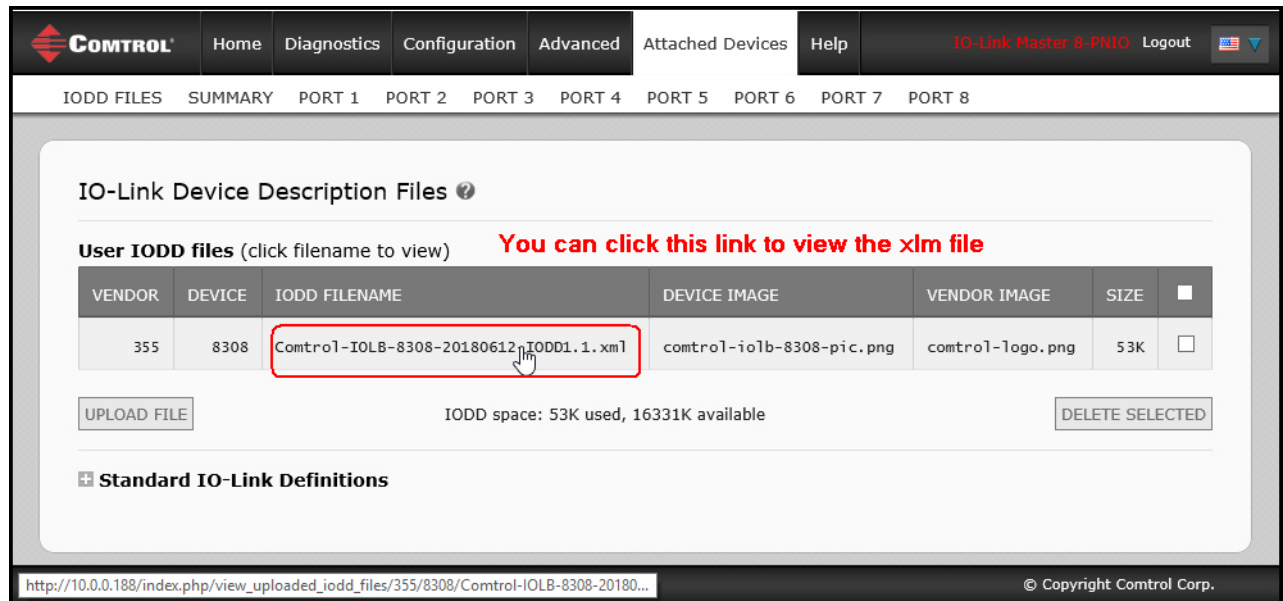


8. Click the **Ok** button.




Note: The above message is expected behavior because the .icon file is not required by the XML file.

9. Optionally, click the file name if you want to view the xml file.



10. Click the **SUMMARY** link to verify that the correct IODD file loaded.



HomeDiagnosticsConfigurationAdvancedAttached DevicesHelp

IO-Link Master 8-PNIOLogout

IODD FILES SUMMARY PORT 1 PORT 2 PORT 3 PORT 4 PORT 5 PORT 6 PORT 7 PORT 8

IO-Link Device Configuration Summary

DEVICE SETTINGS	PORT1	MORE	PORT2	MORE	PORT3	MORE	PORT4
Vendor Name	Control Corporation						
VENDOR	355						
DEVICE	8308						
Description	8-Ch Configurable Digital Input/Output Module, M8						
IO-Link Version	1.1						
Hardware Version	00						
Firmware Version	03						
Baud Rate	230400						
SIO Mode	Yes						
Min Cycle Time	0.5 ms						
IODD Name	Control-IOLB-8308-20180612-IODD1.1.xml						
Serial Number	9655-000005						

< >

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Configuring the IOLB-8308

After loading the IODD file, you are ready to configure the points on the IOLB-8308.

1. If necessary, log into the Control IO-Link Master.
2. Click **Attached Devices | Port x**, where x is the IO-Link port that you have attached the IOLB-8308.
3. Click the **EDIT** button.

Note: For information about using the Control IO-Link Master, refer to the help system or appropriate User Guide for the model.

The screenshot shows the Control IO-Link Master web interface. The top navigation bar includes links for Home, Diagnostics, Configuration, Advanced, Attached Devices, and Help. The main content area is titled 'IO-Link Device - Port 1' and features a table of parameters. A yellow callout box with a red arrow points to the 'Miscellaneous Settings' group, with the text 'You can expand or collapse parameter groups'.

Parameter Name	Index	Subindex	Value	Description	R/W	Unit	Min	Max	Co
- Identification									
Vendor Name	16		Control Corporation		RO				
Vendor Text	17		www.comtrol.com		RO				
Product Name	18		Control IOLB-8308		RO				
Product Text	20		8-Ch Configurable Digital Input/Output Module, M8		RO				
Serial Number	21		9655-000005		RO				
Hardware Version	22		00		RO				
Firmware Version	23		03		RO				
Application Specific Tag	24		*****		RW				
- Parameter									
Input Filter	2048	1	2	0:off 1:0.5 ms 2:3 ms 3:10 ms 4:20 ms	RW		0	4	val
Signal Extension	2048	2	0	0:off 1:0.5 ms 2:3 ms 3:10 ms 4:20 ms 5:50 ms 6:100 ms	RW		0	6	val
+ Miscellaneous Settings									

IO-Link Device ISDU Interface - Port 1

Port Status: Operational, PDI Valid, PDO Invalid

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4. Make the necessary changes to reflect the devices that you intend on connecting and click the **SAVE** button.

Home

Diagnostics

Configuration

Advanced

Attached Devices

Help

IO-Link Master 8-PNO Logout

IODD FILES SUMMARY PORT 1 PORT 2 PORT 3 PORT 4 PORT 5 PORT 6 PORT 7 PORT 8

IO-Link Device - Port 1

User role menu

SAVE

CANCEL

Parameter Name	Index	Subindex	Value	Description	R/W	Unit	Min	Max	Co
- Identification									
Vendor Name	16		Control Corporation		RO				
Vendor Text	17		www.control.com		RO				
Product Name	18		Control IOLB-8308		RO				
Product Text	20		8-Ch Configurable Digital Input/Output Module, M8		RO				
Serial Number	21		9655-000005		RO				
Hardware Version	22		00		RO				
Firmware Version	23		03		RO				
Application Specific Tag	24		*****		RW				
- Parameter									
Input Filter	2048	1	3	0:off 1:0.5 ms 2:3 ms 3:10 ms 4:20 ms	RW		0	4	val
Signal Extension	2048	2	0	0:off 1:0.5 ms 2:3 ms 3:10 ms 4:20 ms 5:50 ms 6:100 ms	RW		0	6	val
- Miscellaneous Settings									

IO-Link Device ISDU Interface - Port 1

Port Status: Operational, PDI Valid, PDO Invalid

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After the page is saved, note that the changes have been implemented.

The screenshot shows the web interface for the IOLB-8308 device. The browser address bar shows the URL `http://10.0.0.188/IODD_Port/1`. The interface includes a navigation menu with options like Home, Diagnostics, Configuration, Advanced, Attached Devices, and Help. The main content area is titled "IO-Link Device - Port 1" and contains a table of parameters. The "Input Filter" parameter is highlighted with a yellow background and the value "3".

Parameter Name	Index	Subindex	Value	Description	R/W	Unit	Min	Max	Co
- Identification									
Vendor Name	16		Control Corporation		RO				
Vendor Text	17		www.control.com		RO				
Product Name	18		Control IOLB-8308		RO				
Product Text	20		8-Ch Configurable Digital Input/Output Module, M8		RO				
Serial Number	21		9655-000005		RO				
Hardware Version	22		00		RO				
Firmware Version	23		03		RO				
Application Specific Tag	24		*****		RW				
- Parameter									
Input Filter	2048	1	3	0:off 1:0.5 ms 2:3 ms 3:10 ms 4:20 ms	RW		0	4	val
Signal Extension	2048	2	0	0:off 1:0.5 ms 2:3 ms 3:10 ms 4:20 ms 5:50 ms 6:100 ms	RW		0	6	val
+ Miscellaneous Settings									

Below the table, there is a section for "IO-Link Device ISDU Interface - Port 1" and a status indicator: "Port Status: Operational, PDI Valid, PDO Invalid".

Technical Data Overview

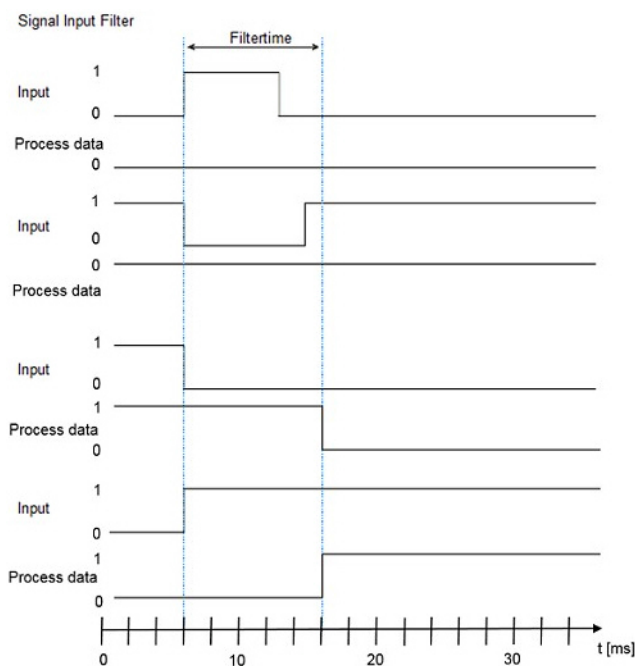
This section provides supporting information for the IOLB-8308.

Input Debouncing and Input Signal Extension

The IOLB-8308 supports a configurable input debouncing and a variable input signal extension for all digital inputs. This can be set through Index 2048. The set value applies for all digital inputs.

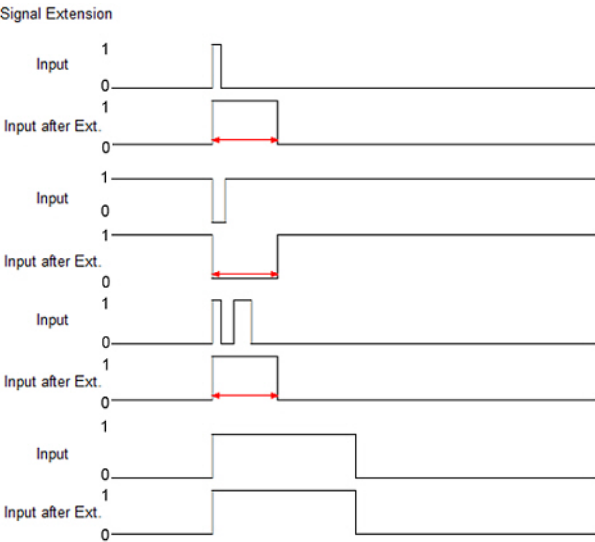
Input filter: Variable Adjustable Over Device Parameter (Index 2048 Subindex 1)	
Value	Filtertime [ms]
0	0
1	0.5
2	3
3	10
4	20

The value decides the delay with which the input value is transferred to the higher-level control. Impulses that are smaller than the filter time will be ignored. In the figure below function examples are presented with a filter time of 10 ms.



Input Signal Extension Time: Variable Adjustable Over Device Parameter (Index 2048 Subindex 2)	
Value	Input Signal Extension Time [ms]
0	0
1	0.5
2	3
3	10
4	20
5	50
6	100

When the filtered input signal transitions either off/on or on/off a minimum pulse width of the value selected in the table above will be generated to the process data.



Object Descriptions

This section provides supporting information for the IOLB-8308 object descriptions.

IOLB-8308 Parameters

Note: The Index and Sub-indexes are displayed as decimal numbers, which match the Control IO-Link Master.

Index	Subindex	Name	Meaning	Data type	Flags	Default
IDENTIFICATION						
16		Vendor Name	Comtrol Corporation	StringT64	RO	N/A
17		Vendor Text	www.comtrol.com	StringT64	RO	N/A
18		Product Name	Comtrol IOLB-8308	StringT64	RO	N/A
20		Product Text	8-Ch Configurable Digital Input/ Output Module, M8	StringT64	RO	N/A
21		Serial Number	9655-XXXXXX	StringT16	RO	N/A
22		Hardware Version	00	StringT64	RO	N/A
23		Firmware Version	04	StringT64	RO	N/A
24		Application Specific Tag	*****	StringT32	RO	N/A
PARAMETER						
2048	01	Input Filter	0: Off 1: 0.5ms 2: 3ms 3: 10ms 4: 20ms	RecordT8	RW	0x0020 (2dec)
2048	02	Signal Extension	0: Off 1: 0.5ms 2: 3ms 3: 10ms 4: 20ms 5: 50ms 6: 100ms	RecordT8	RW	0x0000 (0dec)
MISCELLANEOUS SETTINGS						
2		Standard Command	130 - Restore factory defaults	UINT8	WO	0x0000 (0dec)
12	02	Data Storage Lock		BOOLEAN	RW	0x0000 (0dec)

Diagnostics Parameters

Index	Subindex	Name	Meaning	Data type	Flags
DIAGNOSTICS					
2560	01	Overtemperature	Temperature exceeded limits	RecordT	RO
2560	02	Short detected	Short detected	RecordT	RO
2560	03	US low	US power low	RecordT	RO
2560	04	UA low	UA power low	RecordT	RO
2560	05	UA stat	UA state	RecordT	RO