IO-LINK BLOCK

IOLB-8018

8 Point Digital Input - M12

User Guide

COMTROL®

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Overview

IOLB-8018 Module Overview

The IOLB-8018 is an IO-Link Block (Class A) with Digital Inputs that acquires binary control signals from the process level, and then transfers them (electrically isolated) to the controller. The status of the signal is displayed by LEDs and the signal connection is made through M12 connectors. The sensors are supplied from US1, which is derived from L+.

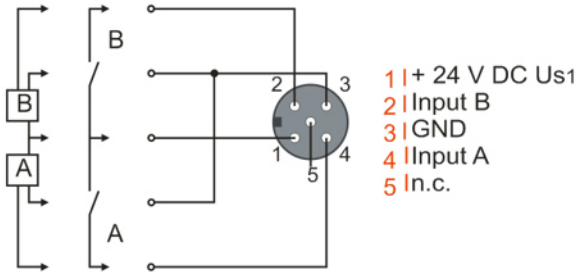
The small IOLB-8018 form factor (H126 x W30 x D26.5 mm) means that they are suitable for use where space is at a premium. The small mass of the IOLB-8018 module facilitates applications with mobile I/O interface, for example, a robot arm.

The robust design of the IOLB-8018 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 M12 connectors.

8 - Digital Inputs

The IOLB-8018 acquires the binary control signals from the process level and transmits them to the higher-level automation unit. The signals are connected using M12 connectors.



3-wire 2-wire

The sensors are supplied from the control voltage U_{S1} with a maximum current of 0.5A.

IOLB-8018 LEDs

This subsection provides information about the IOLB-8018 LEDs.

X1 (IO-Link LED) 	Description
Off	IO-Link communications not active.

X1 (IO-Link LED) 	Description
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-8018 Technical Specifications

IOLB-8018	Technical Data
Communications	IO-Link
Data Transfer Rate	230.4K Baud (COM 3)
IO-Link Connection	1 x M12 Connector A-coded
Specification Version	IO-Link V1.1, Class A
Requirements IO-Link Master	V1.1 Class A
Number of Inputs	8
Input Connections [} 73]	M12
Nominal Input Voltage	24VDC (-15%/+20%)
Input Filter (Adjustable)	3.0ms (Default), Adjustable Between 0ms and 20ms
Input Signal Extension Time (Adjustable)	0ms (default), Adjustable Between 0ms and 100ms
"0" Signal Voltage	-3 to +5V (EN 61131-2, Type 3)
"1" Signal Voltage	+11 to +30V (EN 61131-2, Type 3)
Input Current	Typically 3mA (EN 61131-2, Type 3)
Module Electronic Supply	L+
Module Electronic Current Consumption	Typically 100mA from L+

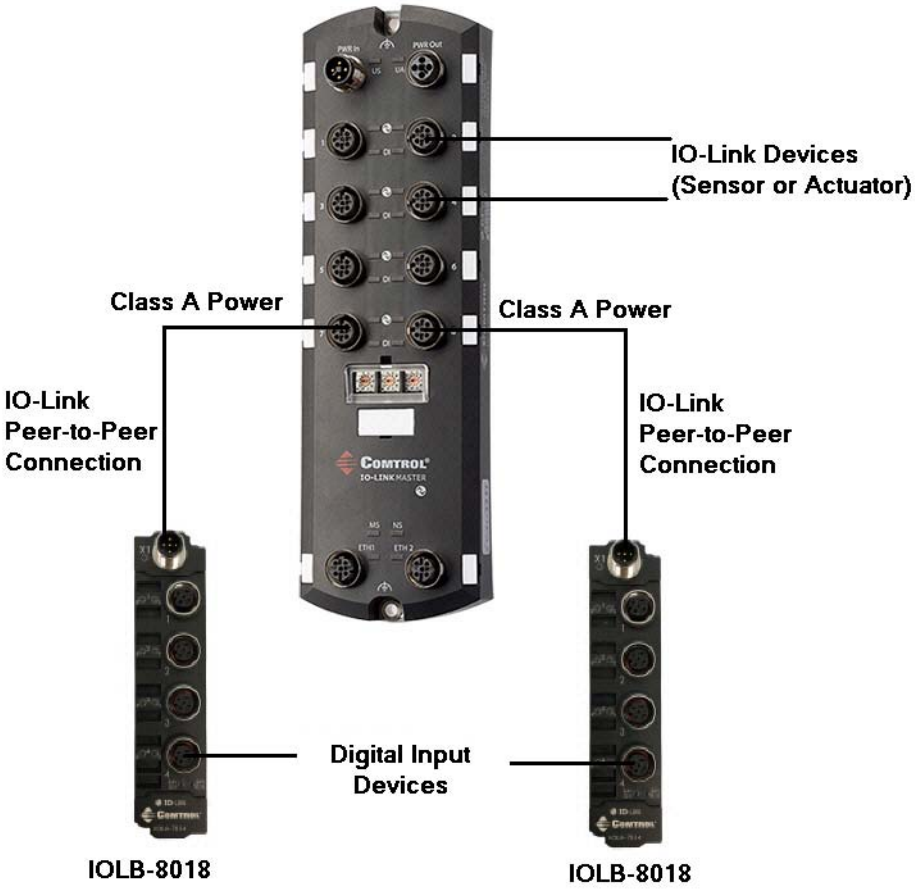
IOLB-8018	Technical Data
Sensor Current Consumption	Maximum 0.5A Total, Short-circuit Proof
Sensor Supply	U_{S1} (Derived from L+)
Process Image	8 Input Bits
Operating Ambient Temperature	-25°C to +60°C
Storage Ambient Temperature Storage	-40°C to +85°C
Vibration / Shock Resistance	EN 60068-2-6 / EN 60068-2-27
EMC Resistance/Emission	EN 61000-6-2 / EN 61000-6-4
Protection Class	IP65, IP66, IP67 (conforms to EN 60529)
Installation Position	Variable
Approvals	CE

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.

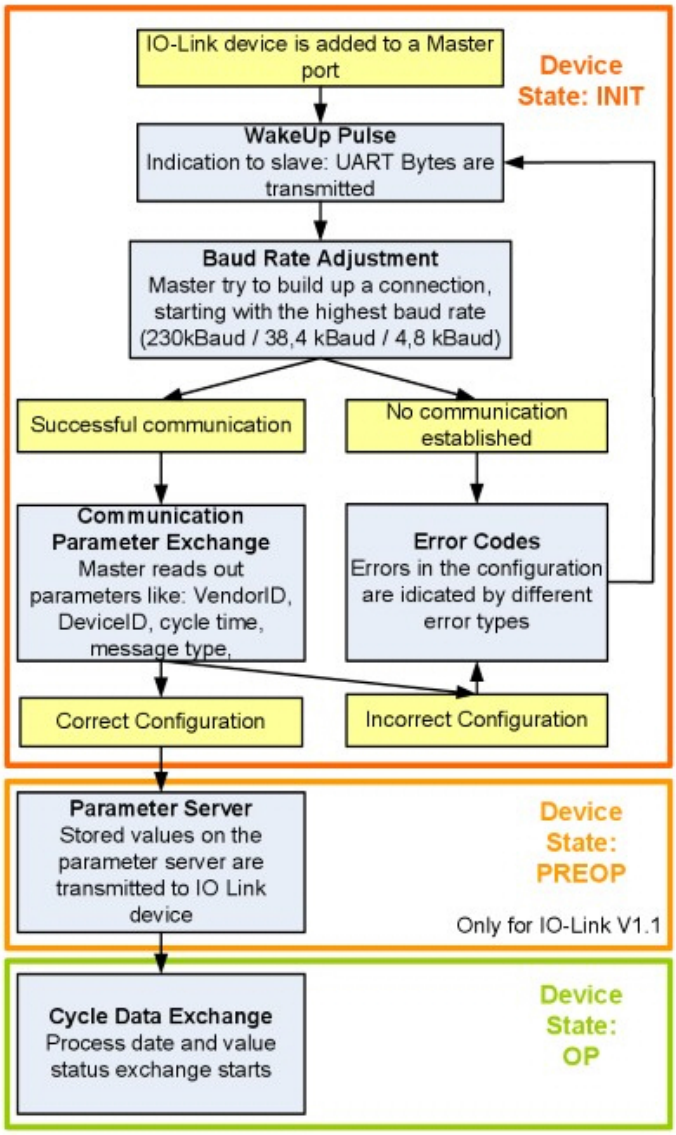
The IOLB-8018 meets the IO-Link specification 1.1. The IO-Link specification is included in the IEC standards and is accepted as IEC 61131-9 in an extended form. In this case, the new designation voltage SDCI is introduced.

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 Comtrol 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.



The connected IO-Link devices have individual parameter information detected during automatic scanning with the Comtrol IO-Link Master. Refer to *Configuring the IOLB-8018* on Page 15 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-8018.

Mounting the IOLB-8018

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

IOLB-8018	
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
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	180g 6.4oz

Note: *While mounting the IOLB-8018, 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-8018.

- Mount the IOLB-8018 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-8018

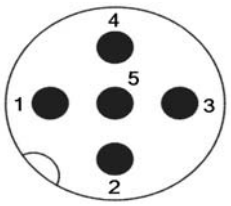
The power supply/supplies that you connect to the IOLB-8018 must meet the following requirements:

- 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-8018 must not be connected to unlimited power sources!

Note: *To meet the UL requirements, the IOLB-8018 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-8018 Technical Specifications* on Page 6.

Pin	Input - Male
1	24V (L+) - electronics power
2	Not connected
3	GND (L-)
4	IO-Link (C/Q)
5	GND (2M)



Use the following procedure to connect the IOLB-8018 to a Class A IP67 IO-Link Master.

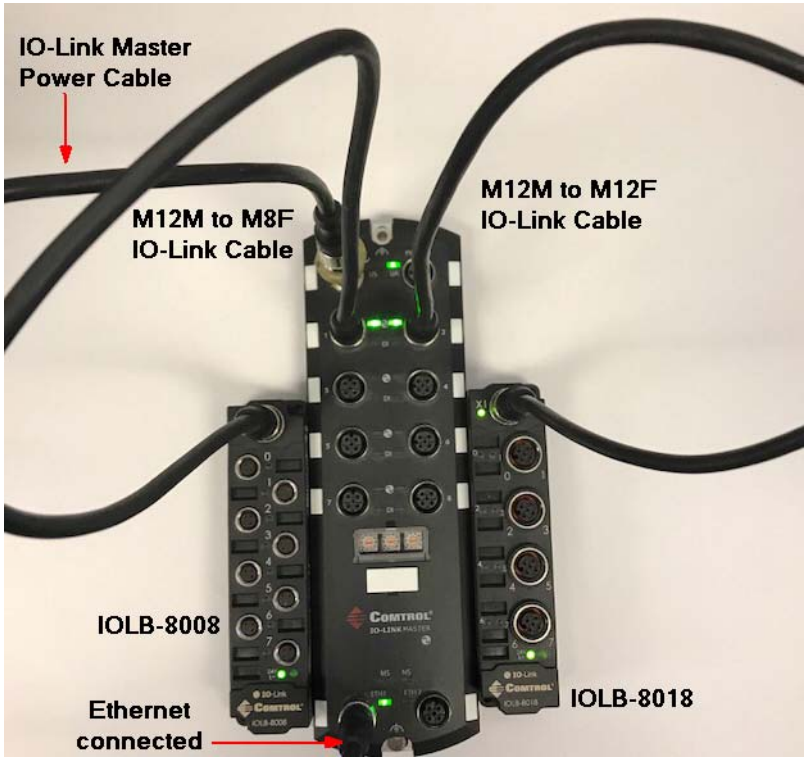
The images in this subsection shows connecting the 8-port IP67 model. Please note that the same procedures work for the 4-port model.

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 male connector to the IO-Link Master IO-Link port.
2. Connect the M12 female connector to the IOLB-8018 connector labeled X1.

   Note: *If the IO-Link Master is powered on, the X1 and 24V L+ LEDs should be lit (green) on the IOLB-8018 and the IO-Link LED should be lit on the IO-Link Master.*

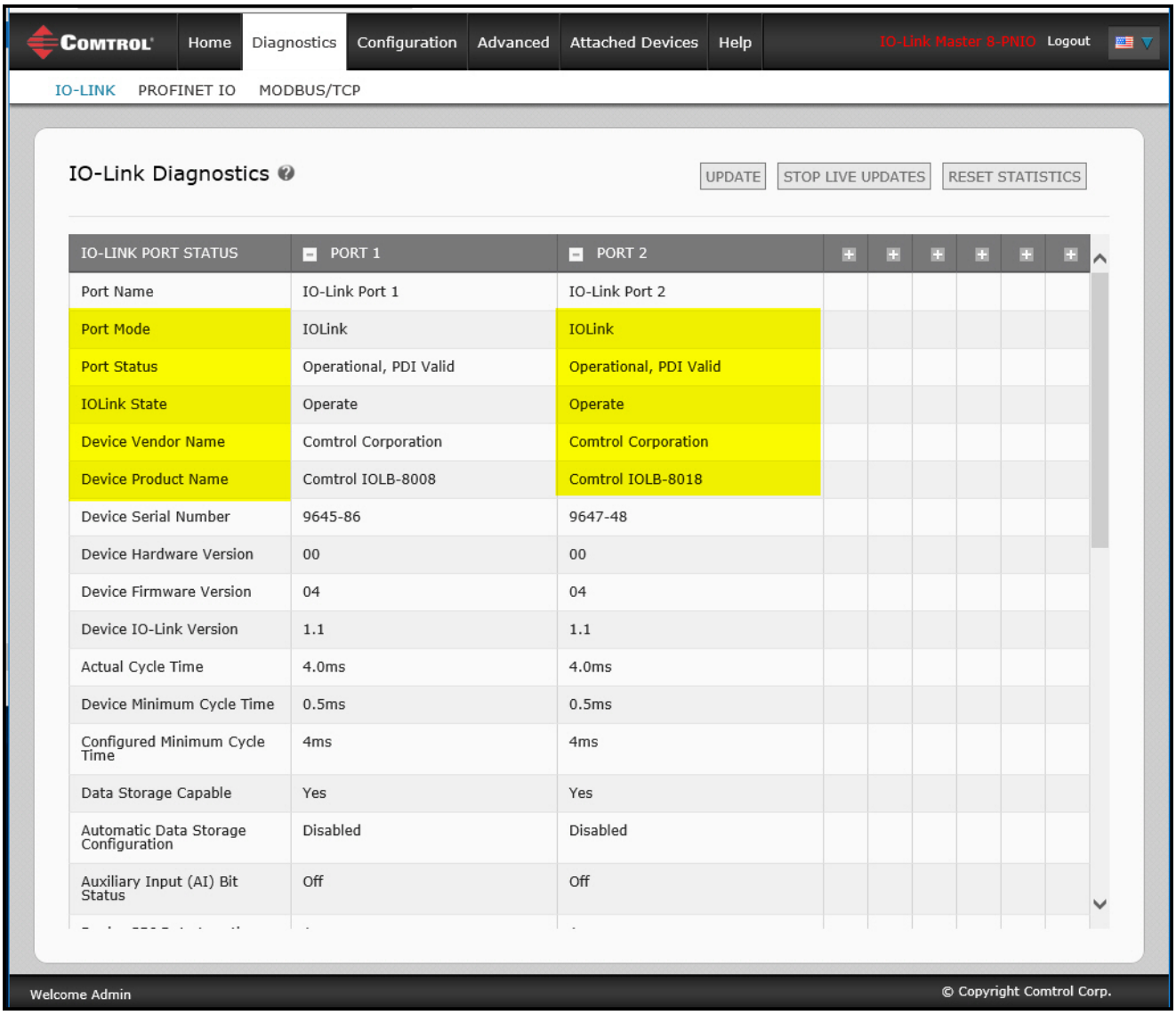
   Refer to IOLB-8018 LEDs on Page 5 for additional information about the LEDs.



Comtrol IO-Link Master Diagnostic Page

You can also verify IOLB-8018 operation by viewing the Comtrol IO-Link Master **IO-Link Diagnostics** page.

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



IO-LINK PORT STATUS	PORT 1	PORT 2
Port Name	IO-Link Port 1	IO-Link Port 2
Port Mode	IOLink	IOLink
Port Status	Operational, PDI Valid	Operational, PDI Valid
IOLink State	Operate	Operate
Device Vendor Name	Comtrol Corporation	Comtrol Corporation
Device Product Name	Comtrol IOLB-8008	Comtrol IOLB-8018
Device Serial Number	9645-86	9647-48
Device Hardware Version	00	00
Device Firmware Version	04	04
Device IO-Link Version	1.1	1.1
Actual Cycle Time	4.0ms	4.0ms
Device Minimum Cycle Time	0.5ms	0.5ms
Configured Minimum Cycle Time	4ms	4ms
Data Storage Capable	Yes	Yes
Automatic Data Storage Configuration	Disabled	Disabled
Auxiliary Input (AI) Bit Status	Off	Off

Configuring the IOLB-8018

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

Locating the IOLB-8018 IODD Files

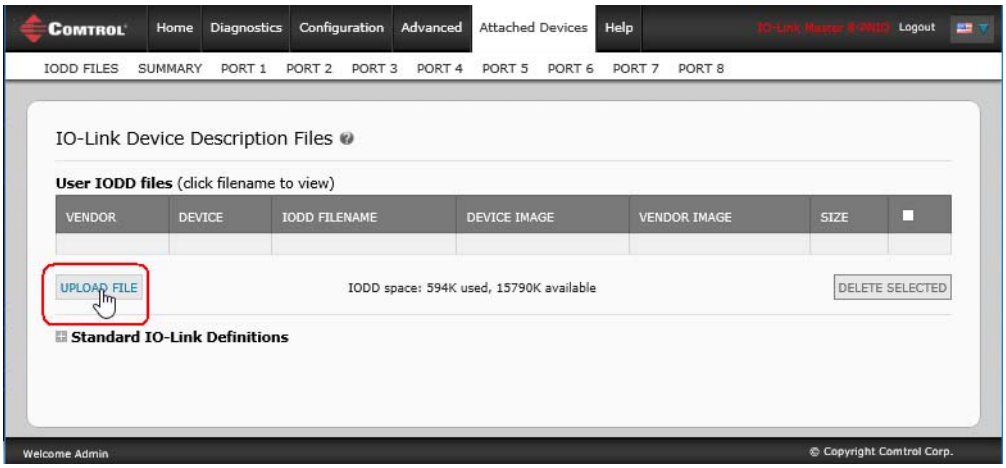
The IOLB-8018 IODD files are located on the Comtrol download site using one of these addresses:

- http://downloads.comtrol.com/IO_Link_Block//IOLB_8018/IODD
- ftp://ftp.comtrol.com/IO_Link_Block/IOLB_8018/IODD

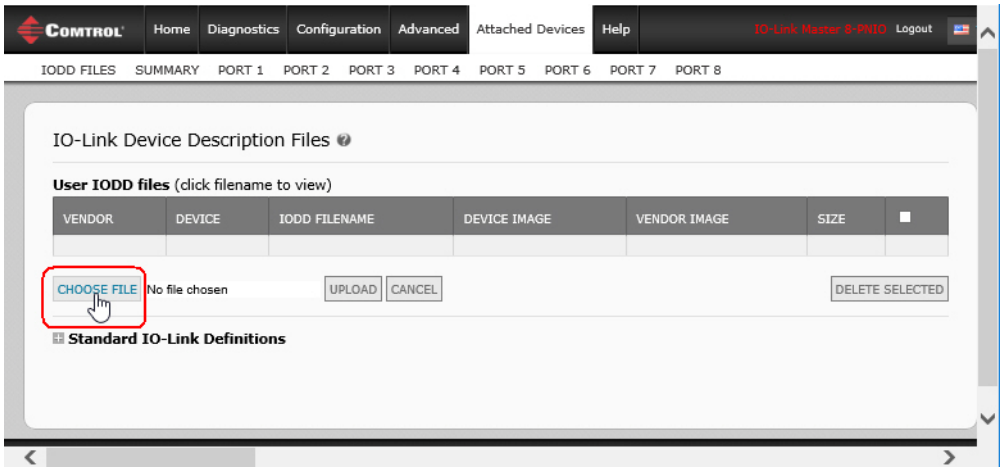
Loading the IODD Files Onto the Comtrol IO-Link Master

Use the following procedure to load the IOLB-8018 IODD file.

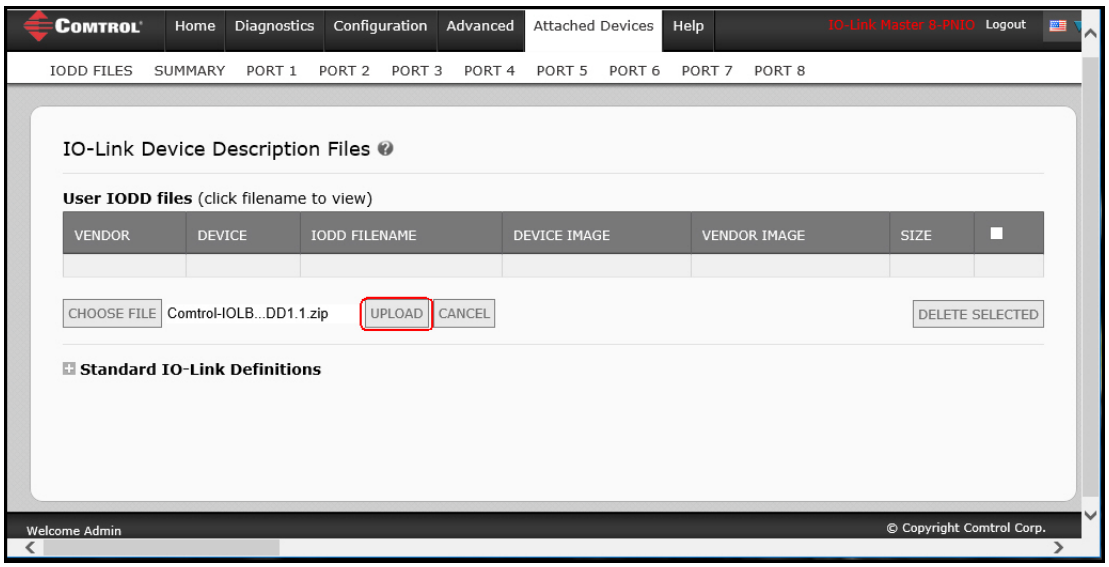
1. If necessary, download the IOLB-8018 IODD files.
2. Log into the Comtrol IO-Link Master using the IP address.
3. Click **Attached Devices**.
4. Click the **UPLOAD FILE** button.



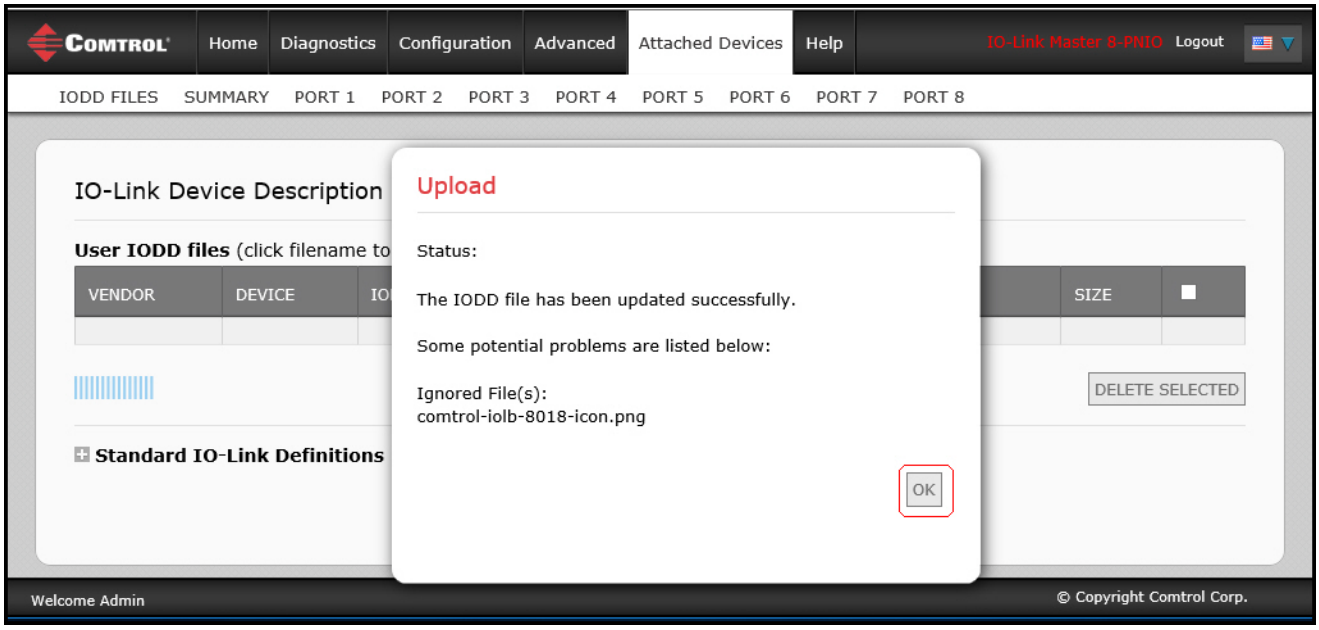
5. Click the **CHOOSE FILE** button.



6. Browse to the location you saved the IODD file and select the file.
7. Click the **UPLOAD** button.

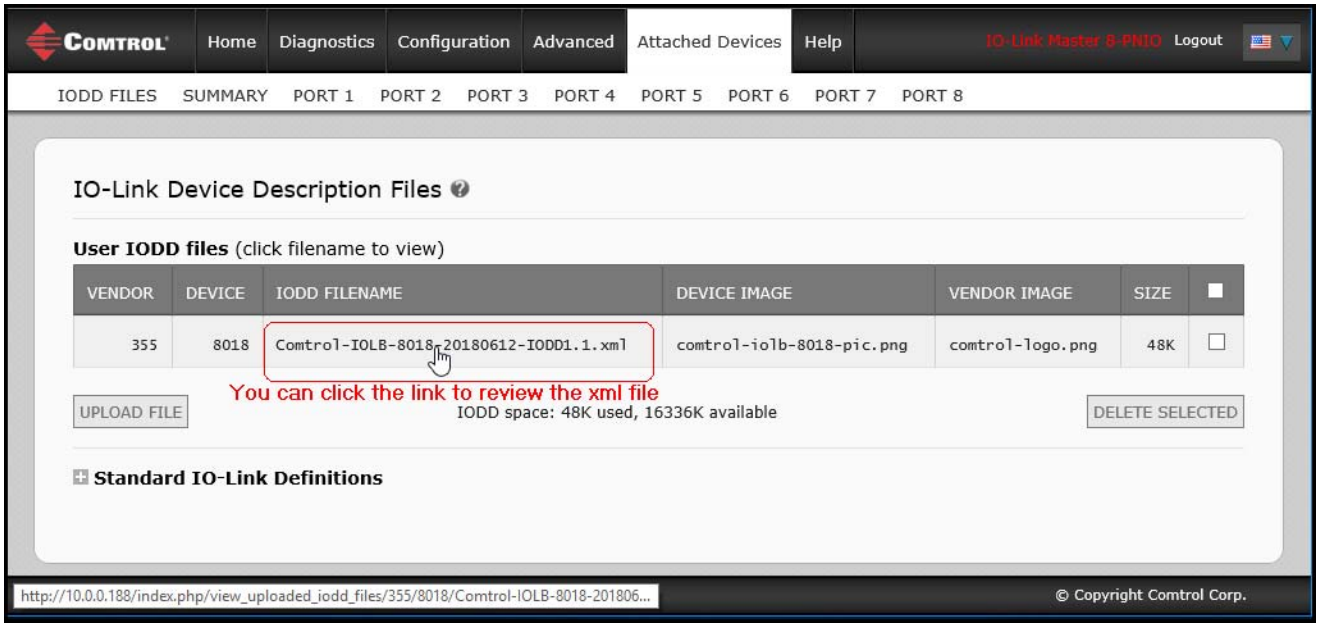


8. Click the **Ok** button.

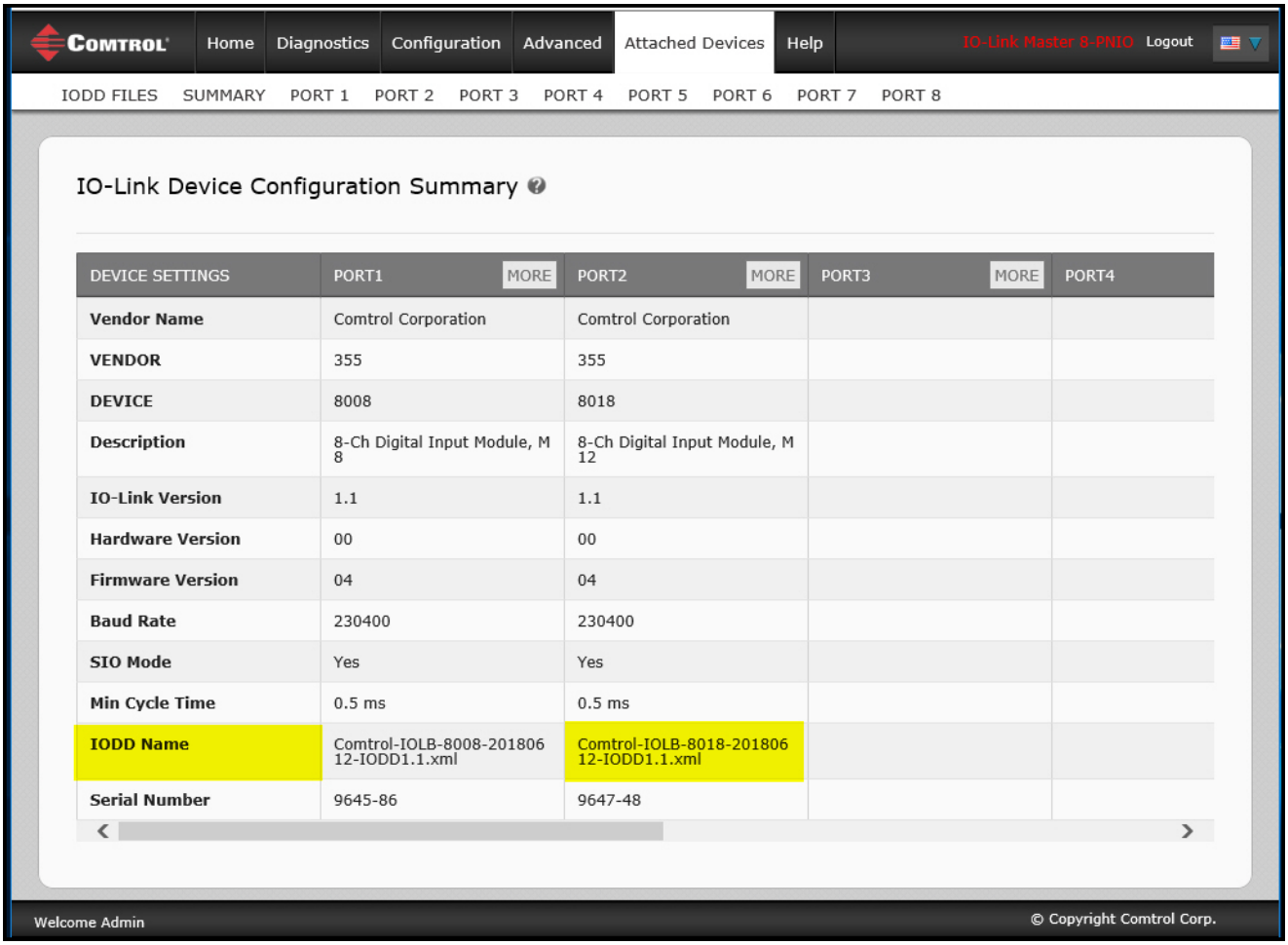


Note: *The above message is expected behavior because the .icon file is not required by the XML file.*

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



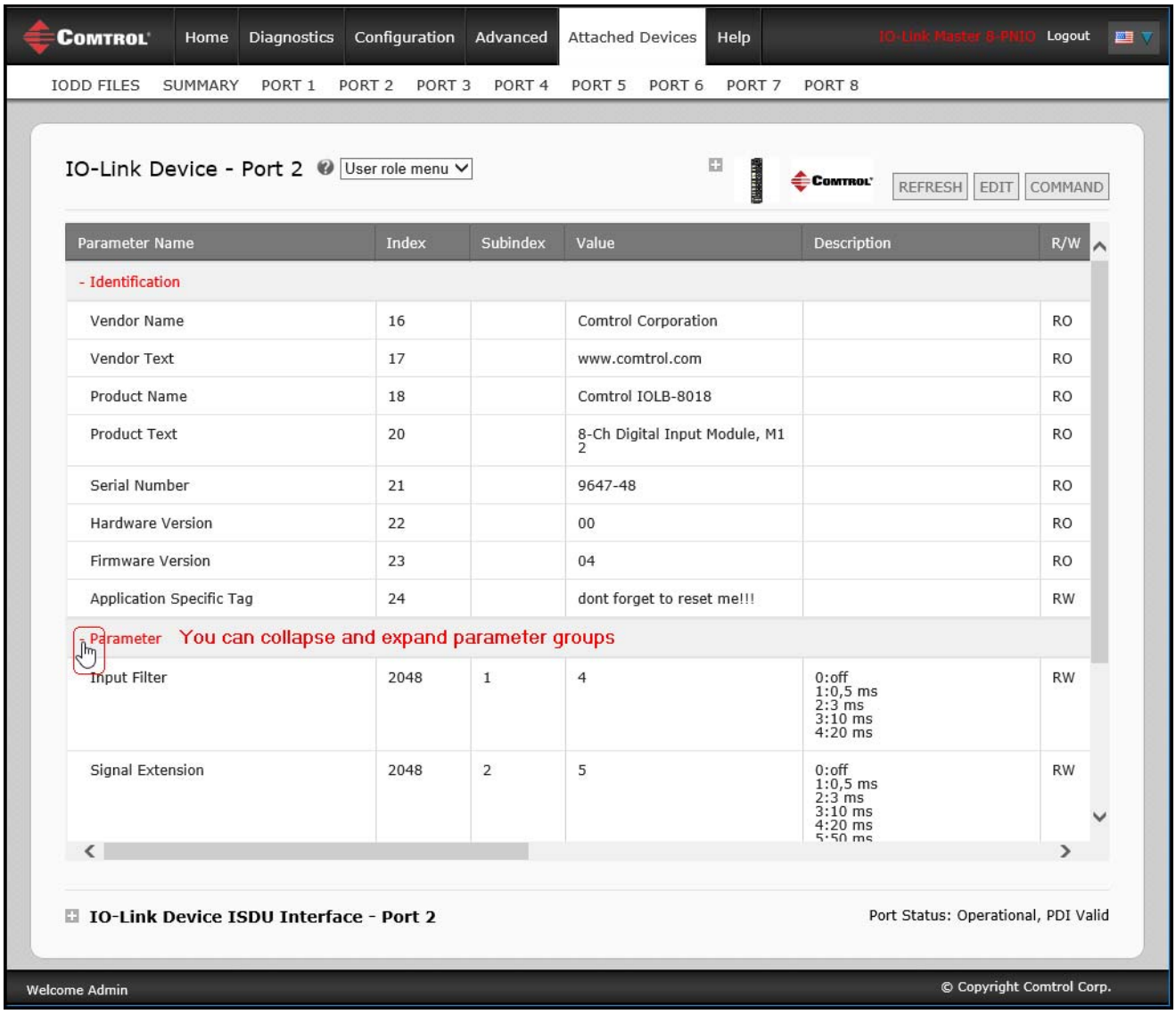
10. Click the **SUMMARY** link to verify that the correct IODD file loaded. If a file name displays in the IODD Name field that means that the correct IODD file is loaded.



Configuring the IOLB-8018

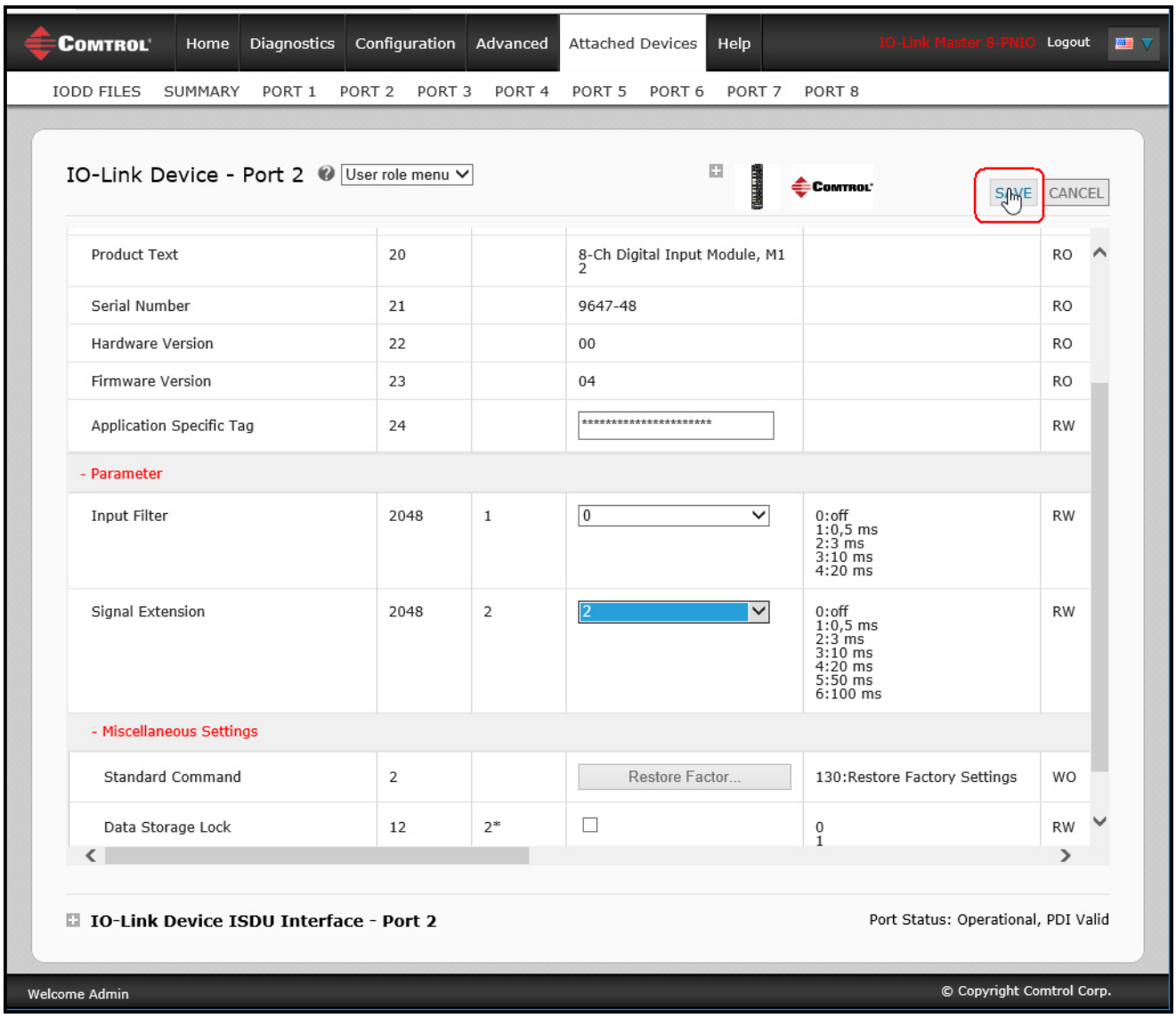
After loading the IODD file, you are ready to configure the points on the IOLB-8018.

1. If necessary, log into the Comtrol IO-Link Master.
2. Click **Attached Devices | Port x,** where x is the IO-Link port that you have attached the IOLB-8018.
3. Click the **EDIT** button.

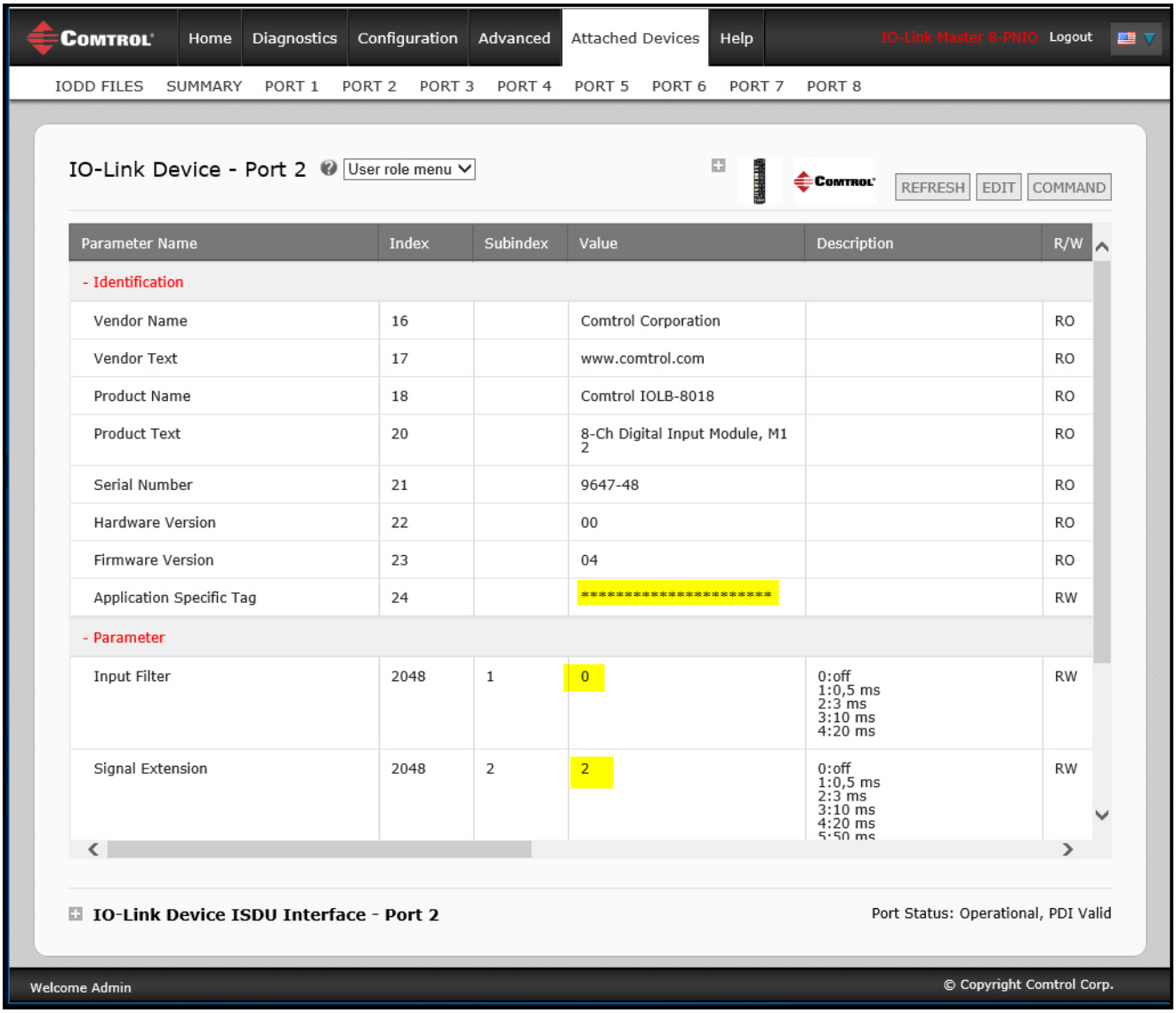


Note: *For information about using the Comtrol IO-Link Master, refer to the help system or appropriate User Guide for the model.*

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



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



Technical Data Overview

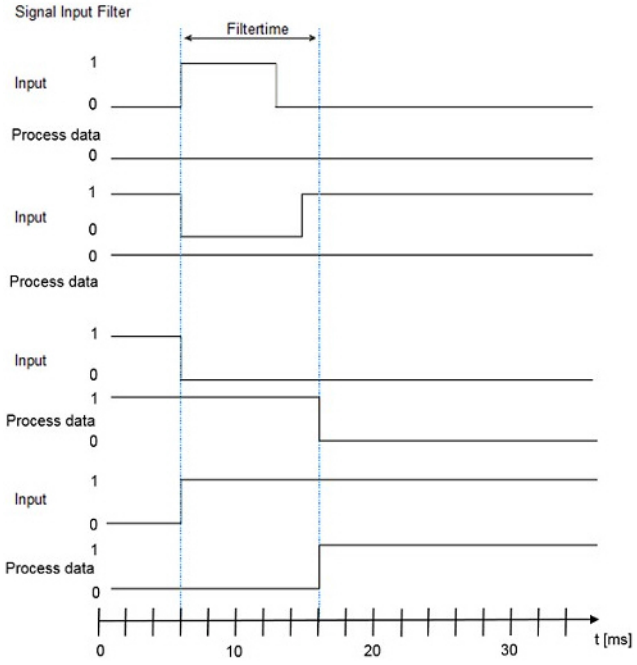
This section provides supporting information for the IOLB-8018.

Input Debouncing and Input Signal Extension

The IOLB-8018 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	**Filter Time [ms]**
0	0
1	0.5
2	3
3	10
4	20

The value decides the delay with which the input value is transfered 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.



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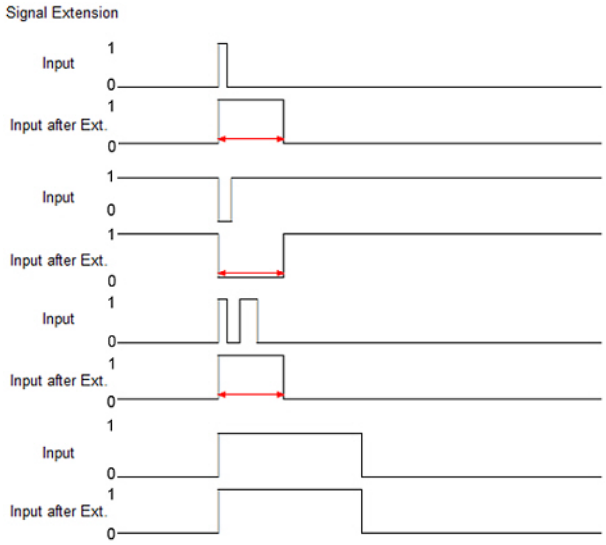
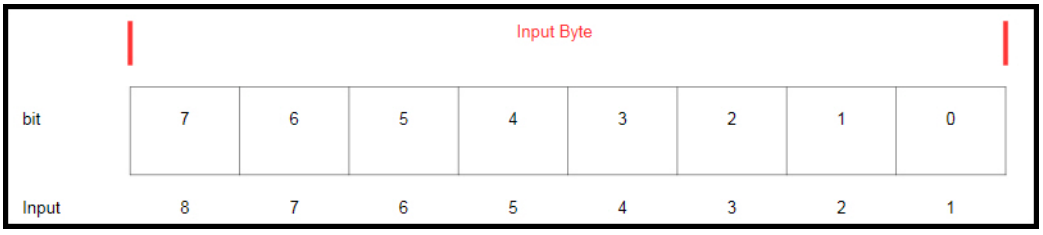
Input Signal Extension Time: Variable Adjustable Over Device Parameter (Index 2048 Subindex 2)	
Value	**Input Signal Extension Time [ms]**
0	0
1	0.5
2	3
3	10
4	20
5	50
6	100

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.



Process Data Input

The following image illustrates the PDI input byte.



Object Descriptions

This section provides supporting information for the IOLB-8018 object descriptions.

IOLB-8018 Parameters

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

Hardware and firmware versions may be different than what is displayed in this table.

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-8018	StringT64	RO	N/A
20		Product Text	8-Ch Digital Input/ Module, M12	StringT64	RO	N/A
21		Serial Number	9647-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 circuit on the IO-Link C/Q line	RecordT	RO
2560	03	L low	Supply voltage too low (<18V)	RecordT	RO
2560	04	2L low	Additional power supply too low (<18V)	RecordT	RO
2560	05	2L stat	Additional power supply non-existent (<8V)	RecordT	RO