

# **IO-LINK BLOCK**

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*IOLB-8018*

## **8 Point Digital Input - M12**

### **User Guide**



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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+.

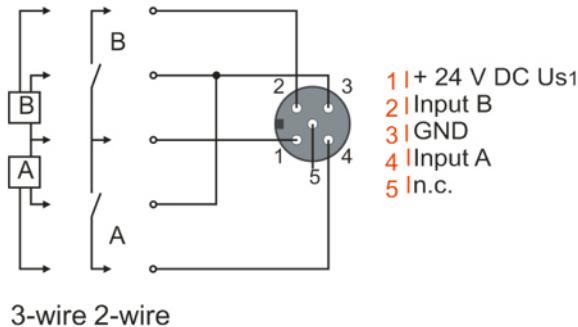
The small IOLB-8018 form factor (H126 x W30 x D26.5 mm) means that they are suitable for use where space is at a premium. The small mass of the IOLB-8018 module facilitates applications with mobile I/O interface, for example, a robot arm.

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.



The sensors are supplied from the control voltage US1 with a maximum current of 0.5A.

## IOLB-8018 LEDs

This subsection provides information about the IOLB-8018 LEDs.

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

<b>X1 (IO-Link LED)</b>	<b>Description</b>
	
Flashing green (1 Hz)	IO-Link communications active.
Lit (Red)	Short circuit on C/Q line or overheating.

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

## IOLB-8018 Technical Specifications

<b>IOLB-8018</b>	<b>Technical Data</b>
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+

<b>IOLB-8018</b>	<b>Technical Data</b>
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.

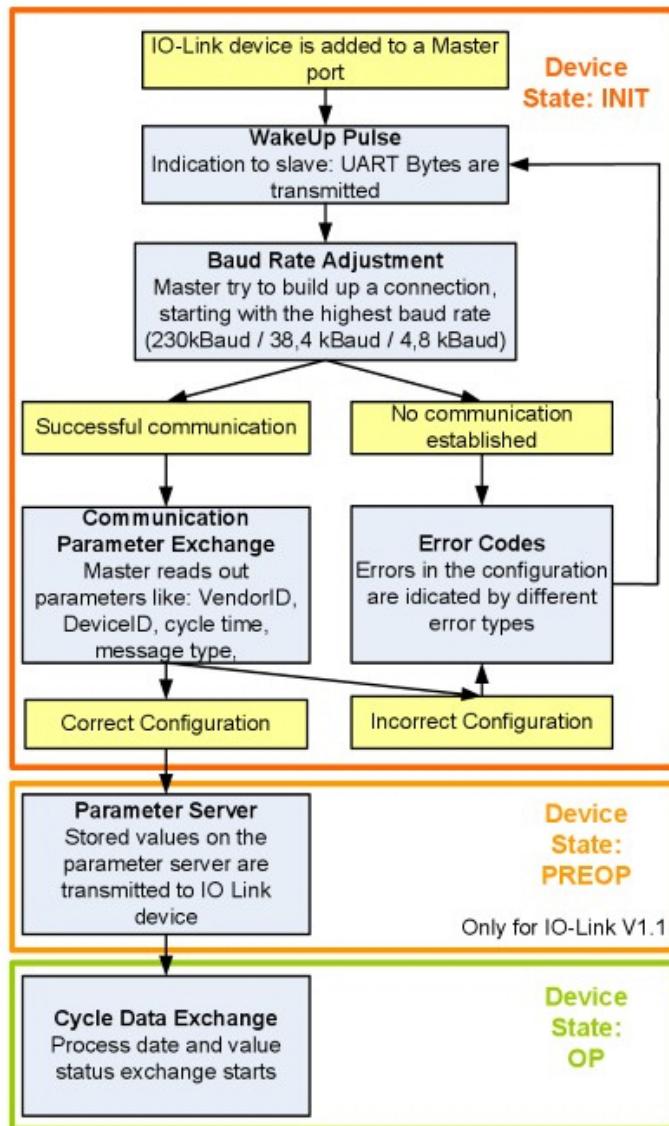
The IOLB-8018 meets the IO-Link specification 1.1. The IO-Link specification is included in the IEC standards and is accepted as IEC 61131-9 in an extended form. In this case, the new designation voltage SDCI is introduced.

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

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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

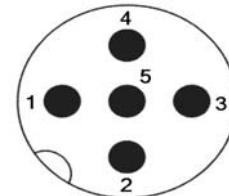
The power supply/supplies that you connect to the IOLB-8018 must meet the following requirements:

- 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.

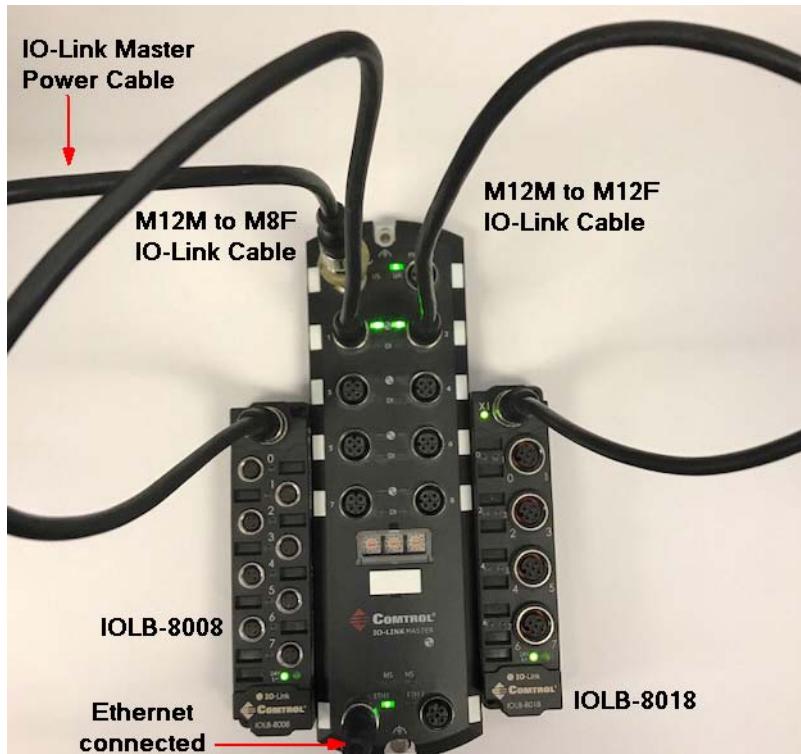
The images in this subsection shows connecting the 8-port IP67 model. Please note that the same procedures work for the 4-port model.

**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.*

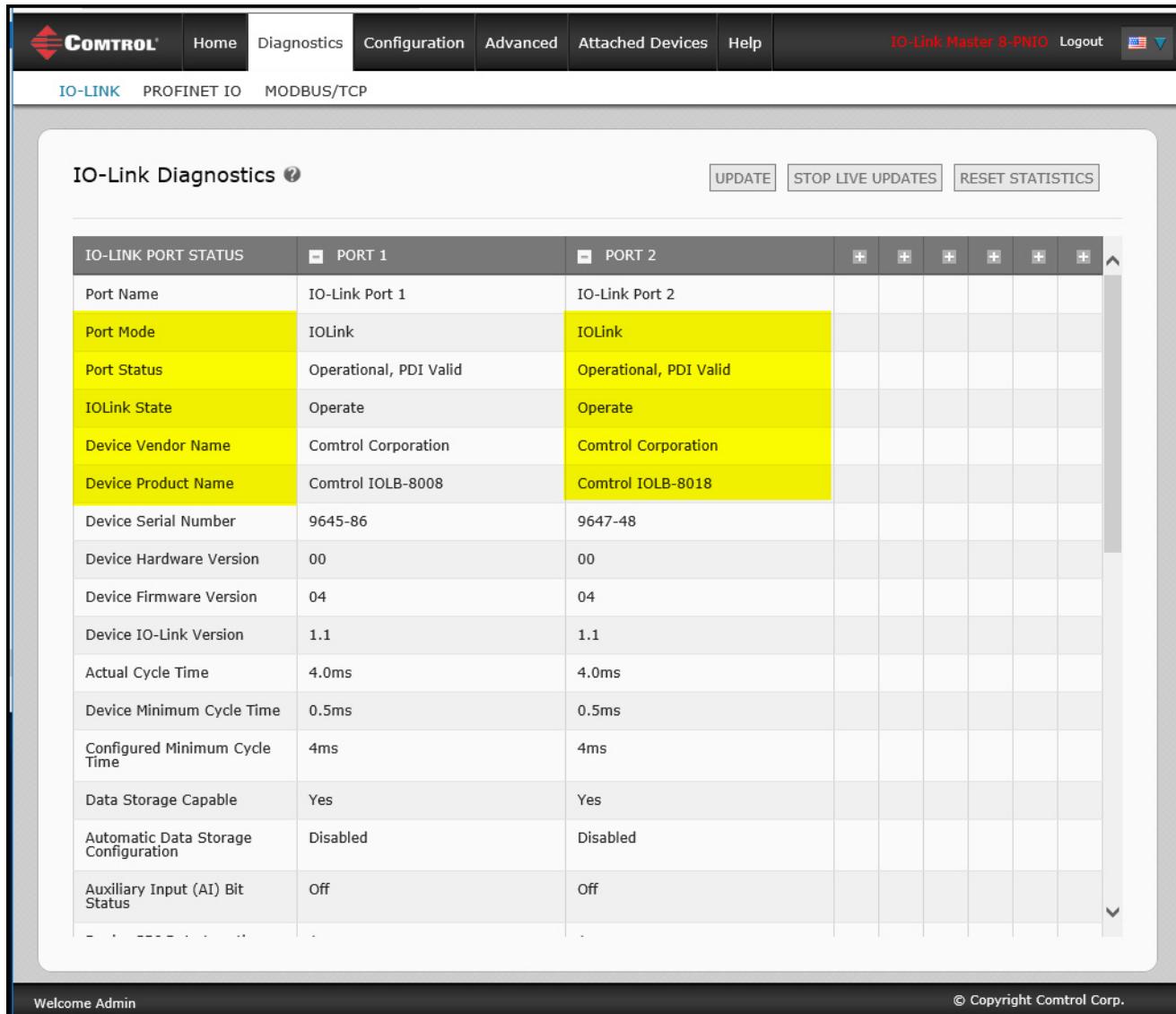
*Refer to [IOLB-8018 LEDs](#) on Page 5 for additional information about the LEDs.*



## 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**.



The screenshot shows the Comtrol IO-Link Master Diagnostic Page. At the top, there is a navigation bar with links for Home, Diagnostics, Configuration, Advanced, Attached Devices, Help, and a language selection dropdown. To the right of the navigation bar are links for "IO-Link Master 8-PNIO", "Logout", and a flag icon. Below the navigation bar, there are three tabs: "IO-LINK", "PROFINET IO", and "MODBUS/TCP". The main content area is titled "IO-Link Diagnostics" with a help icon. It contains a table with two columns, "PORT 1" and "PORT 2". The table rows provide various device and port status information. Rows for Port Name, Port Mode, Port Status, and Device Product Name are highlighted in yellow. The table has scroll bars on the right side. At the bottom of the page, there is a footer bar with the text "Welcome Admin" on the left and "© Copyright Comtrol Corp." on the right.

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-8018	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

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

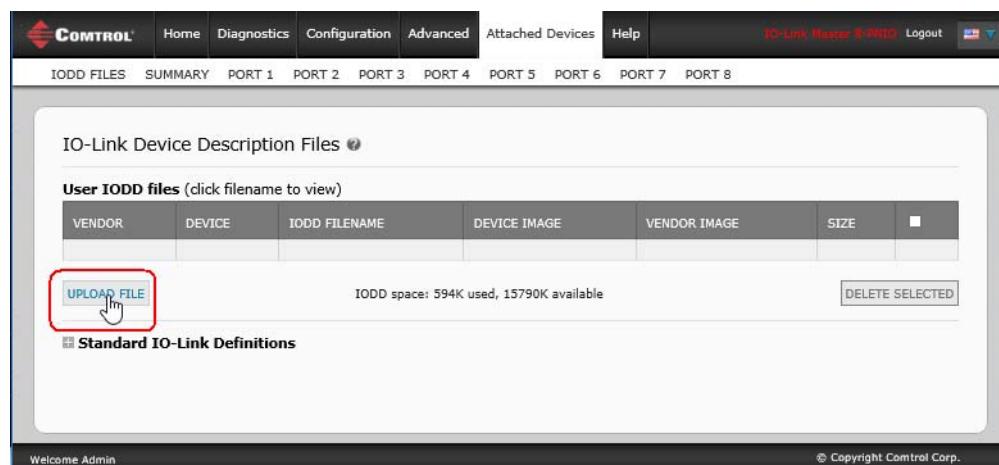
- [http://downloads.comtrol.com/IO\\_Link\\_Block/IOLB\\_8018/IODD](http://downloads.comtrol.com/IO_Link_Block/IOLB_8018/IODD)
- [ftp://ftp.comtrol.com/IO\\_Link\\_Block/IOLB\\_8018/IODD](ftp://ftp.comtrol.com/IO_Link_Block/IOLB_8018/IODD)

## Loading the IODD Files Onto the Comtrol IO-Link Master

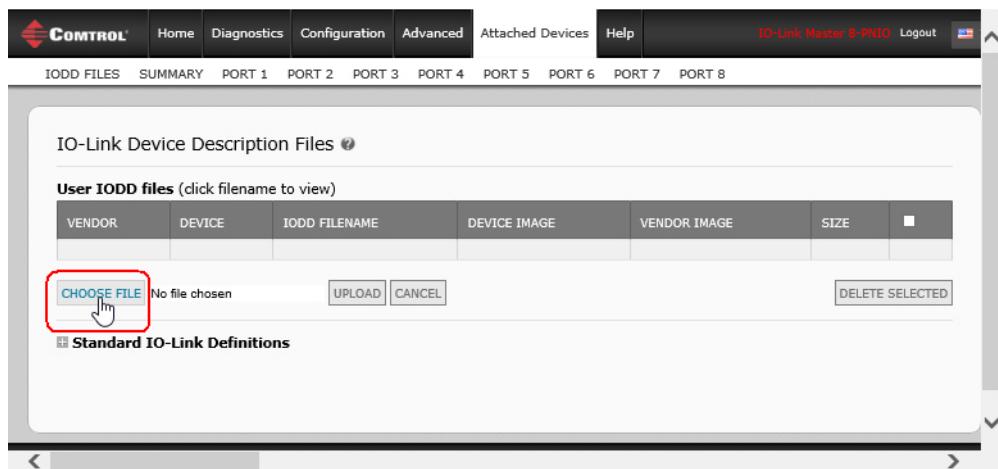
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Use the following procedure to load the IOLB-8018 IODD file.

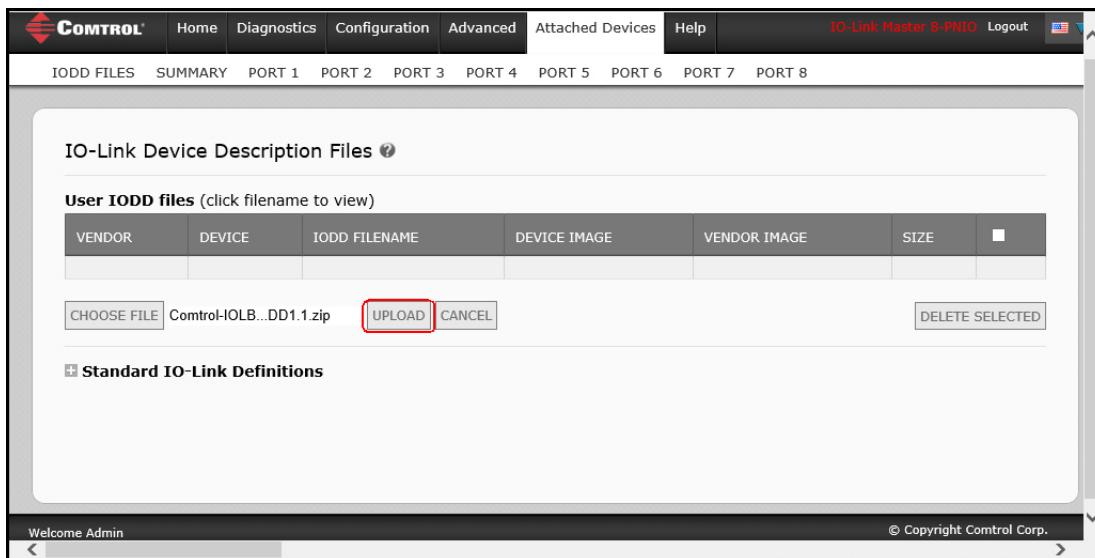
1. If necessary, download the IOLB-8018 IODD files.
2. Log into the Comtrol IO-Link Master using the IP address.
3. Click **Attached Devices**.
4. Click the **UPLOAD FILE** button.



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.



- Click the Ok button.

**IO-Link Device Description**

**Upload**

Status:  
The IODD file has been updated successfully.

Some potential problems are listed below:

Ignored File(s):  
control-iolb-8018-icon.png

**OK**

- Note:** The above message is expected behavior because the .icon file is not required by the XML file.
- Optionally, click the file name if you want to view the xml file.

**IO-Link Device Description Files**

**User IODD files (click filename to view)**

VENDOR	DEVICE	IODD FILENAME	DEVICE IMAGE	VENDOR IMAGE	SIZE
355	8018	Comtrol-IOLB-8018-20180612-IODD1.1.xml	control-iolb-8018-pic.png	control-logo.png	48K

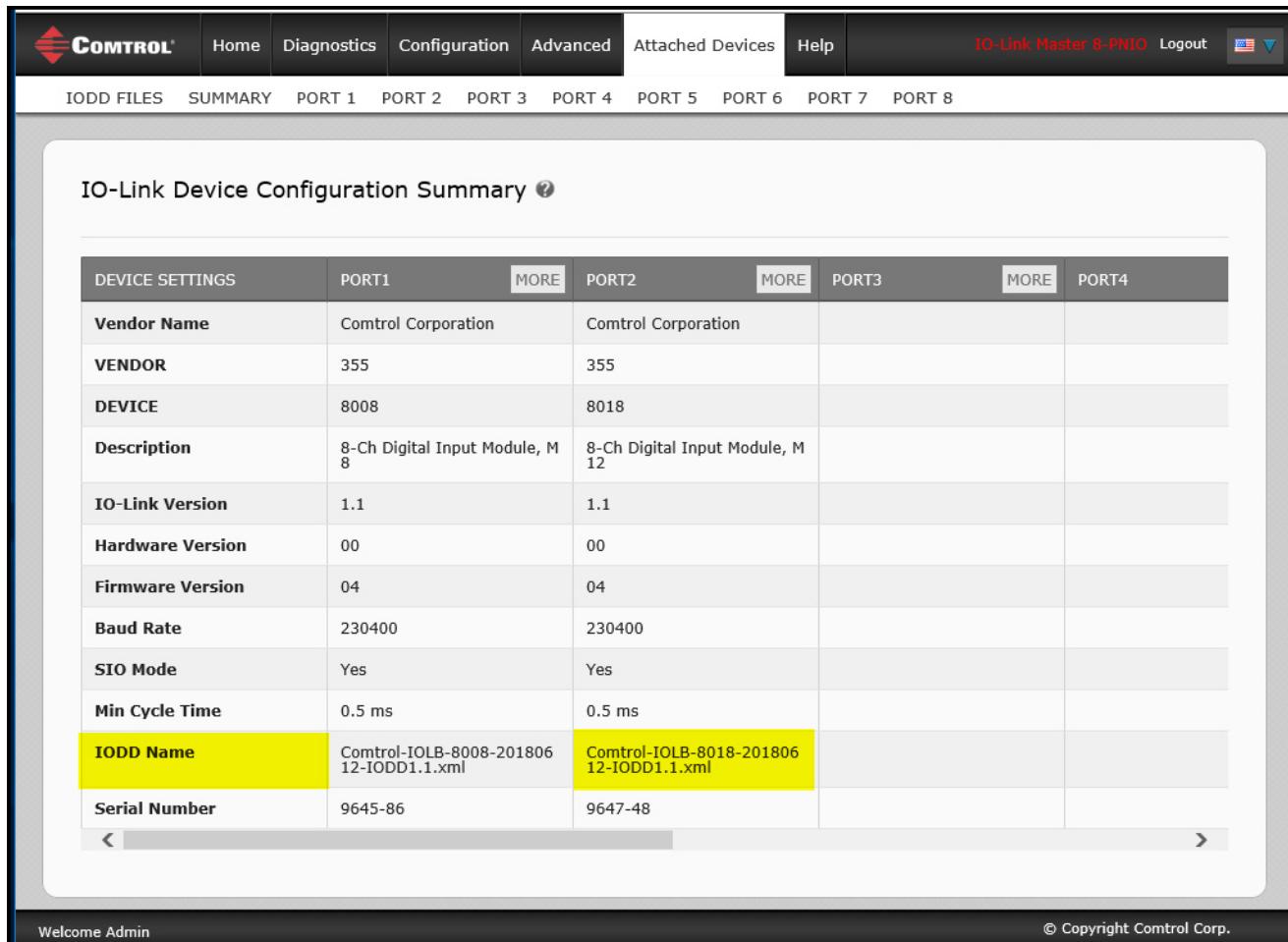
UPLOAD FILE      You can click the link to review the xml file  
IODD space: 48K used, 16336K available      DELETE SELECTED

**Standard IO-Link Definitions**

[http://10.0.0.188/index.php/view\\_uploaded\\_iodd\\_files/355/8018/Comtrol-IOLB-8018-201806...](http://10.0.0.188/index.php/view_uploaded_iodd_files/355/8018/Comtrol-IOLB-8018-201806...)

**OK**

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.



The screenshot shows the Comtrol IO-Link Master software interface. At the top, there is a navigation bar with links for Home, Diagnostics, Configuration, Advanced, Attached Devices, Help, and Logout. The Help button is highlighted in red. To the right of the navigation bar, it says "IO-Link Master 8-PNIO Logout" and shows a small American flag icon.

Below the navigation bar, there is a horizontal menu with tabs: IODD FILES, SUMMARY, PORT 1, PORT 2, PORT 3, PORT 4, PORT 5, PORT 6, PORT 7, and PORT 8. The SUMMARY tab is highlighted in red.

The main content area is titled "IO-Link Device Configuration Summary" with a question mark icon. It contains a table with two columns: "DEVICE SETTINGS" and "PORT1". The table has 11 rows, each representing a configuration parameter. The last two rows, "IODD Name" and "Serial Number", have their values highlighted in yellow.

DEVICE SETTINGS	PORT1	MORE	PORT2	MORE	PORT3	MORE	PORT4
<b>Vendor Name</b>	Comtrol Corporation		Comtrol Corporation				
<b>VENDOR</b>	355		355				
<b>DEVICE</b>	8008		8018				
<b>Description</b>	8-Ch Digital Input Module, M 8		8-Ch Digital Input Module, M 12				
<b>IO-Link Version</b>	1.1		1.1				
<b>Hardware Version</b>	00		00				
<b>Firmware Version</b>	04		04				
<b>Baud Rate</b>	230400		230400				
<b>SIO Mode</b>	Yes		Yes				
<b>Min Cycle Time</b>	0.5 ms		0.5 ms				
<b>IODD Name</b>	Comtrol-IOLB-8008-201806 12-IODD1.1.xml		Comtrol-IOLB-8018-201806 12-IODD1.1.xml				
<b>Serial Number</b>	9645-86		9647-48				

At the bottom left of the interface, it says "Welcome Admin". At the bottom right, it says "© Copyright Comtrol Corp."

## 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.

The screenshot shows the Comtrol IO-Link Master software interface. At the top, there's a navigation bar with tabs for Home, Diagnostics, Configuration, Advanced, Attached Devices (which is selected), Help, and a user account section. Below the navigation bar is a sub-navigation bar with tabs for IODD FILES, SUMMARY, PORT 1, PORT 2, PORT 3, PORT 4, PORT 5, PORT 6, PORT 7, and PORT 8. The main content area is titled "IO-Link Device - Port 2". It contains a table for parameter configuration with columns for Parameter Name, Index, Subindex, Value, Description, and R/W status. A note says "You can collapse and expand parameter groups". Below the table, there's a section for "Input Filter" and "Signal Extension" with dropdown menus showing options like "0:off", "1:0,5 ms", etc. At the bottom, there's a footer with "Welcome Admin" and "Port Status: Operational, PDI Valid".

Parameter Name	Index	Subindex	Value	Description	R/W
- Identification					
Vendor Name	16		Comtrol Corporation		RO
Vendor Text	17		www.comtrol.com		RO
Product Name	18		Comtrol IOLB-8018		RO
Product Text	20		8-Ch Digital Input Module, M1 2		RO
Serial Number	21		9647-48		RO
Hardware Version	22		00		RO
Firmware Version	23		04		RO
Application Specific Tag	24		dont forget to reset me!!!		RW
<b>Parameter</b> You can collapse and expand parameter groups					
Input Filter	2048	1	4	0:off 1:0,5 ms 2:3 ms 3:10 ms 4:20 ms	RW
Signal Extension	2048	2	5	0:off 1:0,5 ms 2:3 ms 3:10 ms 4:20 ms 5:50 ms	RW

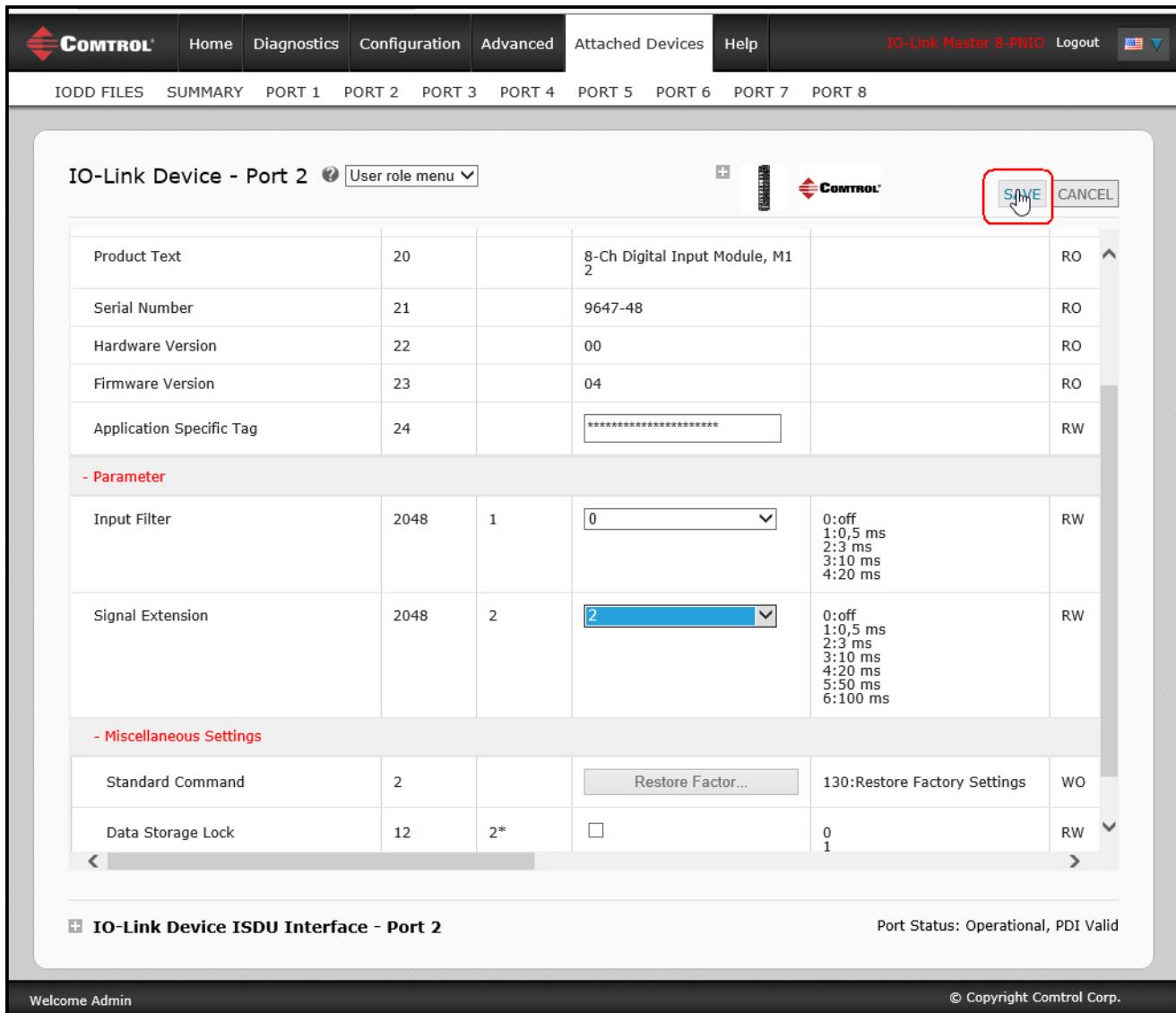
**IO-Link Device ISDU Interface - Port 2**      Port Status: Operational, PDI Valid

Welcome Admin      © Copyright Comtrol Corp.

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

## Configuring the IOLB-8018

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



The screenshot shows the COMTROL Configuration software interface for the IOLB-8018. The top navigation bar includes Home, Diagnostics, Configuration, Advanced, Attached Devices, Help, IO-Link Master 8-PNIO, Logout, and a language selection icon. Below the navigation is a menu bar with IODD FILES, SUMMARY, PORT 1, PORT 2, PORT 3, PORT 4, PORT 5, PORT 6, PORT 7, and PORT 8. The main content area displays the 'IO-Link Device - Port 2' configuration page. It includes sections for Product Text, Serial Number, Hardware Version, Firmware Version, Application Specific Tag, Parameter settings (Input Filter and Signal Extension), and Miscellaneous Settings (Standard Command and Data Storage Lock). The 'Parameter' section shows dropdown menus for Input Filter (values 0, 1, 2, 3, 4) and Signal Extension (values 0, 1, 2, 3, 4, 5, 6). The 'Miscellaneous Settings' section includes a 'Restore Factor...' button and a 'Data Storage Lock' checkbox. At the bottom, there is an 'IO-Link Device ISDU Interface - Port 2' section and a note about Port Status: Operational, PDI Valid. The 'SAVE' button in the top right corner is circled in red.

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

Parameter Name	Index	Subindex	Value	Description	R/W
<b>- Identification</b>					
Vendor Name	16		Comtrol Corporation		RO
Vendor Text	17		www.comtrol.com		RO
Product Name	18		Comtrol IOLB-8018		RO
Product Text	20		8-Ch Digital Input Module, M1 2		RO
Serial Number	21		9647-48		RO
Hardware Version	22		00		RO
Firmware Version	23		04		RO
Application Specific Tag	24		*****		RW
<b>- Parameter</b>					
Input Filter	2048	1	0	0:off 1:0,5 ms 2:3 ms 3:10 ms 4:20 ms	RW
Signal Extension	2048	2	2	0:off 1:0,5 ms 2:3 ms 3:10 ms 4:20 ms 5:50 ms	RW

**IO-Link Device ISDU Interface - Port 2**      Port Status: Operational, PDI Valid

Welcome Admin      © Copyright Comtrol Corp.



# Technical Data Overview

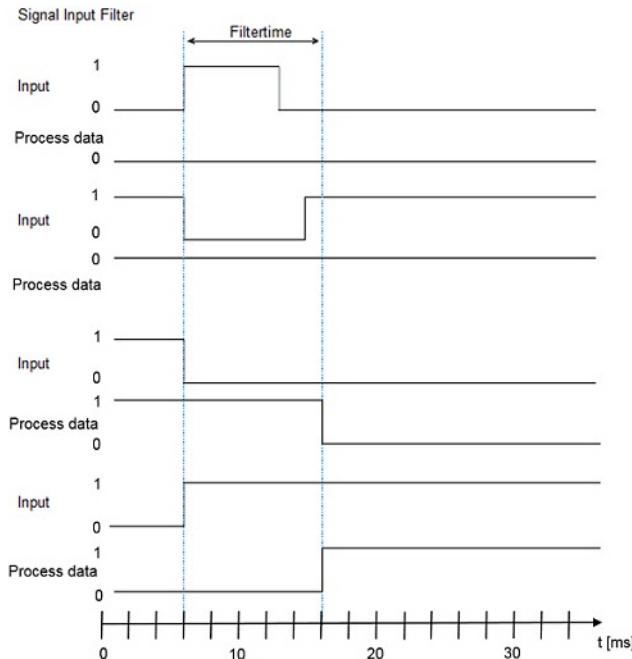
This section provides supporting information for the IOLB-8018.

## 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.

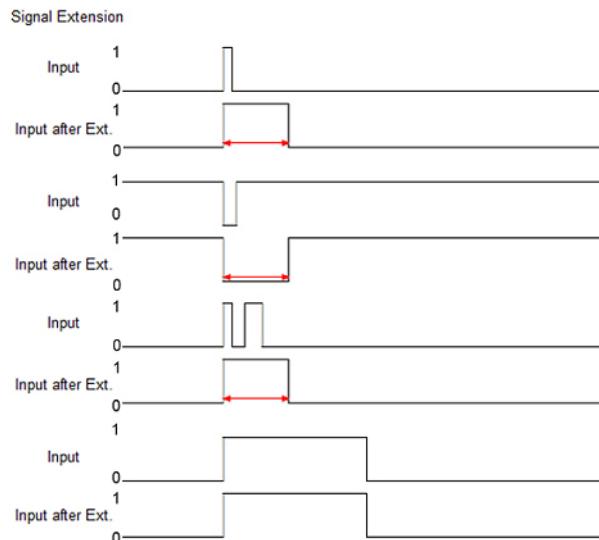
Input Filter: Variable Adjustable Over Device Parameter (Index 2048 Subindex 1)	
Value	Filter Time [ms]
0	0
1	0.5
2	3
3	10
4	20

The value decides the delay with which the input value is 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

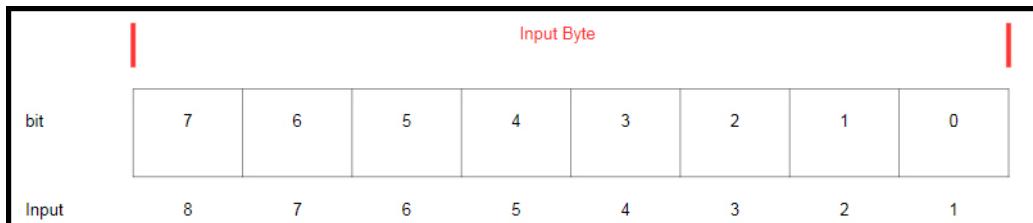
When the filtered input signal transitions either off/on or on/off a minimum pulse width of the value selected in the table above will be generated to the process data.



## Process Data Input

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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
<b>Identification</b>						
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
<b>Parameter</b>						
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)
<b>Miscellaneous Settings</b>						
2		Standard Command	130 - Restore factory defaults	UINT8	WO	0x0000 (0dec)
12	02	Data Storage Lock		BOOLEAN	RW	0x0000 (0dec)

## Diagnostics Parameters

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Index	Subindex	Name	Meaning	Data type	Flags
<b>Diagnostics</b>					
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