ENGINEERING YOUR SUCCESS.

PARKER PCH PORTAL (EtherNet/IP)

PCH1xExxxx-Px

User Manual

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CHAPTER - 1 General

Trademark Information

Ethernet/IP™ is a trademark of Open DeviceNet Vendor Association (ODVA).

About this Guide

This user guide is intended for those who are responsible for installing, configuring, and troubleshooting PCH Portal and its associated software and accessories.

Safety Information

Please read and follow all the safety information for the Parker Communication for H-Series (PCH) Portal, including the warning and caution statements in this guide, before installing or operating the system.

WARNING: The PCH Portal is used to control electrical and mechanical components of motion control systems in industrial environments. To avoid serious injury or damage to equipment, test the motion system for safety under all potential conditions.

WARNING: The PCH Portal is not intended for any use in systems, machines, or applications where failure or fault of the products could reasonably be seen to lead to death or serious bodily injury of any person, or to severe physical or environmental damage ("High Risk Use"). You are not permitted to use, distribute, or sublicense the use of these products in High risk use applications. High risk use is STRICTLY PROHIBITED.

WARNING: The PCH Portal contains no user-serviceable parts. To avoid personal injury or damage to the product, do not attempt to open the case or to replace any internal component of the PCH Portal, Modules, or Accessories.

WARNING:USER RESPONSIBILITY- Improper use of the products described herein or related items can cause death, personal injury and property damage.

CAUTION: Modification of endplate must always be done under the supervision of a Parker representative. If not, this may void any warranties.

Important User Information

This document and other information from Parker Hannifin Corporation, its subsidiaries or authorized distributors provides product or system options for further investigation by users having technical expertise.

The user, through their own analysis and testing is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyse all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalogue and in any other materials provided from Parker, its subsidiaries, or authorized distributors.

To the extent that Parker, its subsidiaries, or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable for all applications and reasonably foreseeable uses of the components or systems.

Intended Use

The PCH Portal must be used as follows:

- As intended for industrial environments and conditions as compliant with the regulatory agencies of the region.
- In the original state without unauthorized modifications to the unit. The only permissible configurations and/or modifications allowed are mentioned in the documentation supplied with the product.
- In perfect technical condition.
- The PCH Portal has been developed and manufactured in accordance with the basic and proven safety principles of EN ISO 13849, LVD 2014/35/EU (low voltage directive) and EN61000-6-2 (Electromagnetic compatibility) and European Machinery Directive 2006/42/EC. The requirements of EN ISO 13849-1 and EN ISO 13849-2 must be taken into consideration to implement and operate the PCH Portal. When using this product in machines or systems subject to specific C standards, the requirements specified in these standards must be observed.
- This product is not CSA Certified. To conform to CSA C22.2 requirements please ensure the PCH Portal is connected to a class 2 power supply or equal as outlined in CSA Article 2.024 for low voltage equipment. The output of this power supply may not exceed 100 VA, with the operating voltage not more than 30 V rms, 42.4 V peak, or 60 V dc.

If standard accessories/components are connected (e.g. sensors, actuators, etc.) the specified limits of pressure, temperature, electrical data, torques, etc. must be complied with.

“Even though care has been taken in the preparation and publication of the contents of this manual, we do not assume legal or other liability for any inaccuracy, mistake, misstatement, or any other error of whatsoever nature contained herein. The material in this manual is for information purposes only, and is subject to change without notice.”

1.6 Service Information

Consult the local Parker Service Agent if you have any technical problems or queries.

1.7 Assumptions of Technical Experience

Parker Hannifin Corporation assumes qualified personnel are involved in the servicing of industrial control systems and trained in recognizing hazards in products with hazardous energy levels. To install and troubleshoot the PCH Portal, the personnel must have a fundamental understanding of the following:

- Electronic concepts such as voltage, current, and switches
- Knowledge on the mechanical aspects of mounting the PCH Portal in the machine tool environment
- Good understanding of the Networking concepts and implementation of safety circuitry

1.8 Product Naming

This guide describes the following product:

- PCH Portal

NOTE: For ordering information/part number structure, refer to Appendix section 8.1.4

1.9 Notes, Cautions, and Warnings

This guide uses notes, cautions, and warnings throughout the text to draw attention to information that is especially important or useful.

WARNING: A warning provides information about a potential for property damage, personal injury, or death.

CAUTION: A caution provides information intended to help prevent improper use of the product or damage to the product hardware or software.

NOTE: A note provides information intended to make the best use of the product from Parker Hannifin Corporation.

CHAPTER - 2 **Overview**

2.1 Product Overview

The PCH Portal is a networked slave IO control device that supports multiple “Industrial Ethernet” communication protocols to communicate with other industrial controllers in the automation industry.

The PCH Portal is engineered to interface with a manifold containing up to 32 H ISO Universal valve channels as well as to offer a wide variety of discrete and IO-Link input/output arrangements for motion control, while withstanding the temperature ranges, vibrations, and electrical noise of industrial environments.

Figure 1 — PCH Portal

2.2 Module Overview

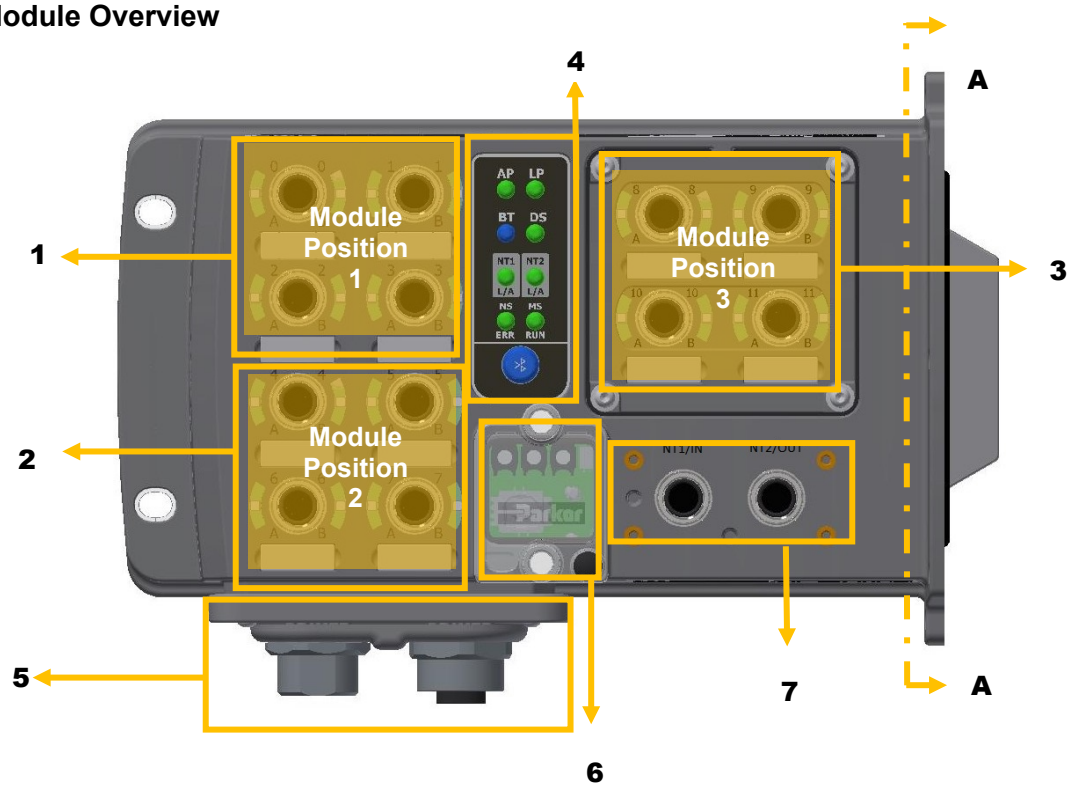


Figure 2 — Module Overview

Table 1 — Module Overview

Module Overview	
Item No	**Part Name**
1	Module Position 1 *
2	Module Position 2 *
3	Module Position 3 **
4	Status LEDs/Bluetooth enable button
5	Power Supply Connectors
6	Rotary Switches, USB connector (Type B)
7	Network Communication Ports – NT1 and NT2
A	Connection to H Universal Air Supply

Notes:

* IO-Link A, IO-Link B, IO-Link B+
** IO-Link A, IO-Link B, IO-Link B+, Blank Plate

2.3 Power Supply Connectors:

The Aux and Logic power connectors supply the power to all modules of the PCH Portal, the mother board and other modules.

The following four types of power connectors are available based on the end user's requirement. Power consumption requirements must be considered when selecting a power connection. When using the power out connector to supply downstream power, the total power consumption available for downstream devices is equal to maximum capacity of connector pins (AUX_{PT} = 20A and LOG_{PT} = 20A) less the current draw of PCH. The PCH internal limits are as follows: AUX_{PCH} = 12A and LOG_{PCH} = 8A. The PCH internal limits include devices connected to any of the 3 IO/IO-Link modules, and total wattage of the valve coils. Care must be taken in knowing the downstream current draw in order not to overload the maximum current rating of the pins. User can select 4-pin or 5-pin connectors configurations.
NOTE: 5 pin connectors utilize pin 3 for protective earth ground.

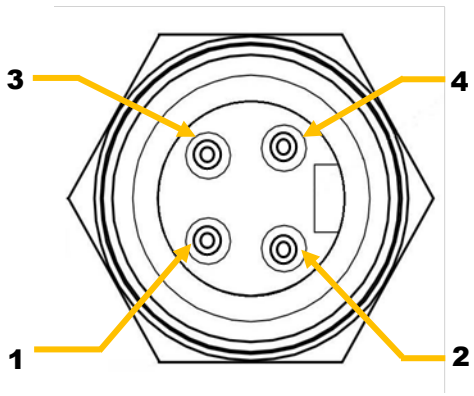
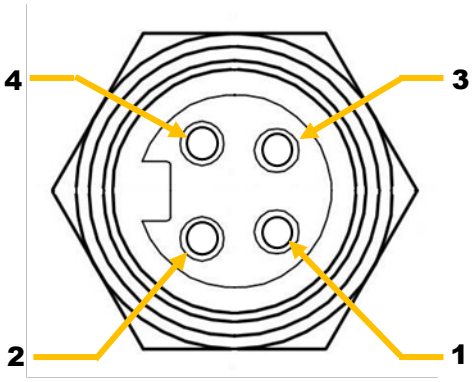
Zone 1-3 is 24Vdc ,3.84A and Zone 4 is 24V, 1.28A.

Table 2 — Types of Aux Power Connectors

Type of Aux Power Connectors	Connector Pin	Connector Configuration	Description
A and B	4 Pin	IN OUT	4 Pin - A - Power IN - Power OUT
	5 Pin	IN OUT	5 Pin - B - Power IN - Power OUT
C and D	4 Pin	IN IN	4 Pin - C - Power IN - Power IN
	5 Pin	IN IN	5 Pin - D - Power IN - Power IN

Type 1: 4 Pin "A" (Power IN-Power OUT)

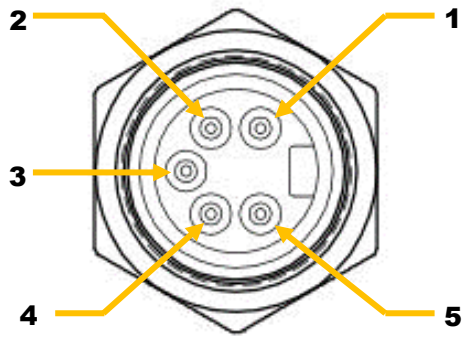
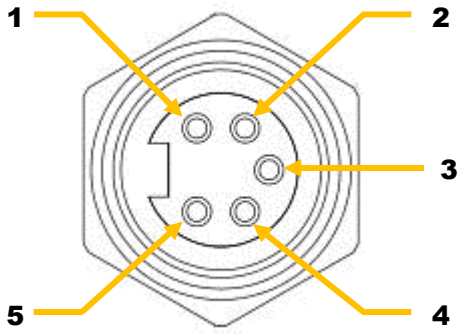
Table 3 — 4 Pin "A" (Power IN-Power OUT)

Power In (Male)	Power Out (Female)
	

Pin	Function	Description		Function	Description
1	+24 V	+24V V2 (VAUX)		+24 V	+24V V2 (VAUX)
2	+24 V	+24V V1 (VLOG)		+24 V	+24V V1 (VLOG)
3	0 V	GND V1 (VLOG)		0 V	GND V1 (VLOG)
4	0 V	GND V2 (VAUX)		0 V	GND V2 (VAUX)

Type 2: 5 Pin "B" (Power IN-Power OUT)

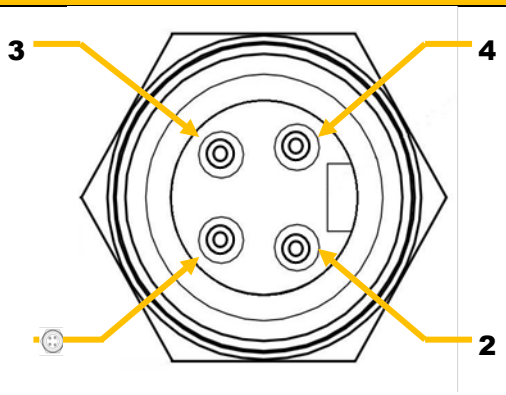
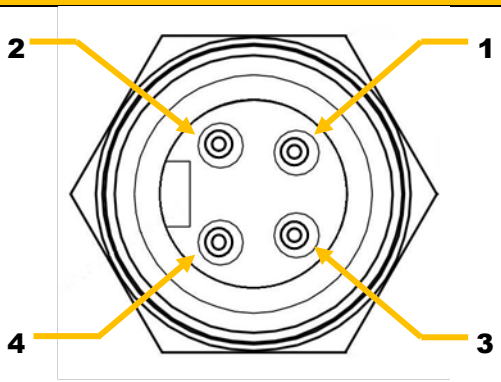
Table 4 — 5 Pin "B" (Power IN-Power OUT)

Power In (Male)	Power Out (Female)
	

Pin	Function	Description		Function	Description
1	0 V	GND V2 (VAUX)		0 V	GND V2 (VAUX)
2	0 V	GND V1 (VLOG)		0 V	GND V1 (VLOG)
3	Protective Earth	Protective Earth		Protective Earth	Protective Earth
4	+24 V	+24V V1 (VLOG)		+24 V	+24V V1 (VLOG)
5	+24 V	+24V V2 (VAUX)		+24 V	+24V V2 (VAUX)

Type 3: 4 Pin "C" (Power IN-Power IN)

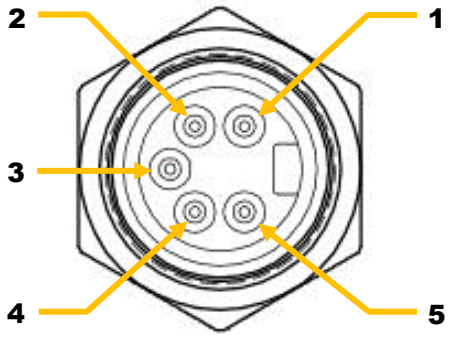
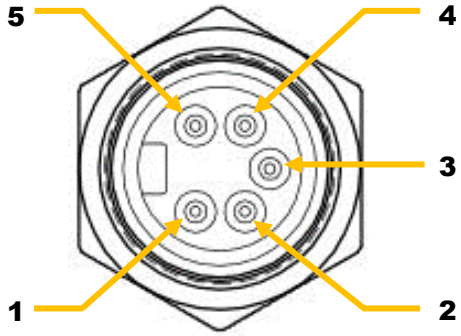
Table 5 — 4 Pin "C" (Power IN-Power IN)

Power In (Male)	Power In (Male)
	

Pin	Function	Description		Function	Description
1	+24V	+24V V2 (VAUX)		+24V	+24V V2 (VAUX) 1-3
2	+24V	+24V V1 (VLOG)		+24V	+24V V2 (VAUX) 4
3	0V	GND V1 (VLOG)		0V	Safe GND 1-3
4	0V	GND V2 (VAUX)		0V	Safe GND 4

Type 4: 5 Pin “D” (Power IN-Power IN)

Table 6 — 5 Pin “D” (Power IN-Power IN)

Power In (Male)	Power In (Male)
	

Pin	Function	Description		Function	Description
1	0V	GND V2 (VAUX)		+24V	+24V V2 (VAUX) 1-3
2	0V	GND V1 (VLOG)		+24V	+24V V2 (VAUX) 4
3	Protective Earth	Protective Earth		Protective Earth	Protective Earth
4	+24V	+24VV1 (VLOG)		0V	Safe GND 1-3
5	+24V	+24V V2 (VAUX)		0V	Safe GND 4

All four types of power connectors are capable of operating with SAFE pulsed power; however, it is recommended to use the 4 Pin C type and 5 Pin D type connector boards to connect SAFE 24Vdc auxiliary source in PP or PM mode for valve control, as the grounds are isolated. The connection diagram is as shown below:

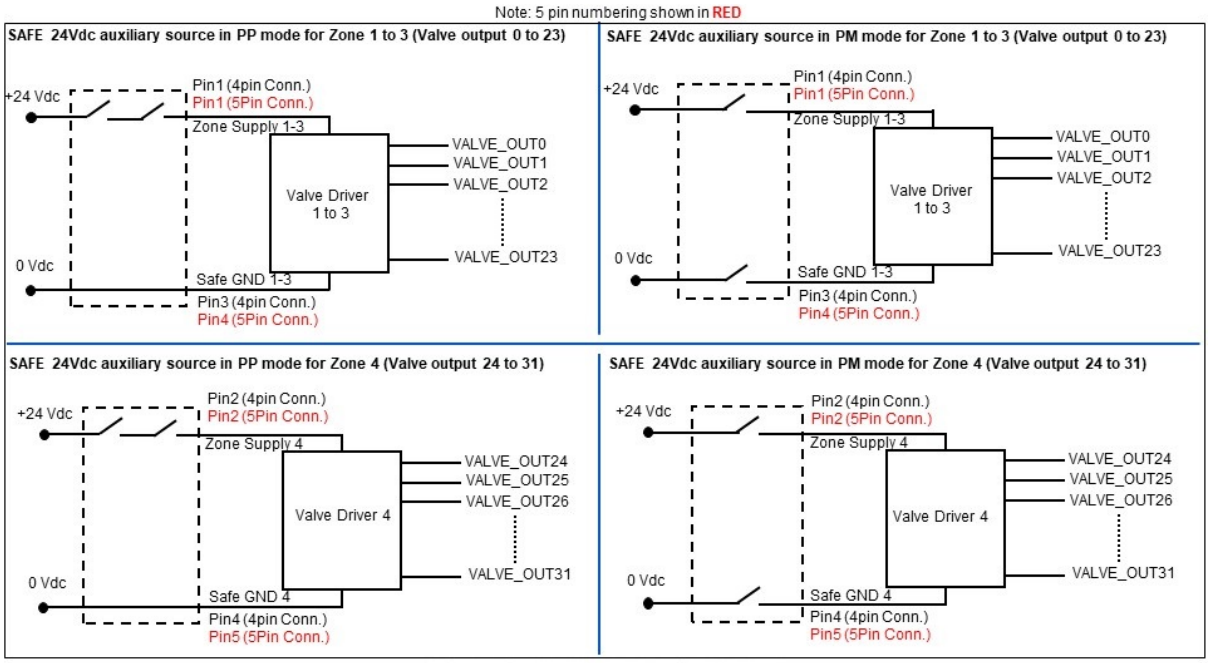


Figure 3 — C / D Board Wiring

NOTE:

The power back-up functionality (storing of cycle counts and error/warning/event log) of PCH Portal is not guaranteed to function if the PCH Portal is operated outside operating voltage range i.e. when the logic voltage is <= 20.4V

If Aux voltage goes below the operating voltage range for the duration of 225 +/- 25 msec then the valve outputs and Aux voltage digital outputs are turned OFF for safety purpose. This behaviour is not applicable for IO-Link A module as outputs on this module operate on logic supply.

To avoid unwanted motion in field a hysteresis of 200 mV is maintained to turn ON/OFF outputs in case of Aux voltage error condition.

2.4 Grounding

The chassis ground is connected to the earth connection at the highlighted point below:

Figure 4 — Grounding Point

2.5 I/O and IO-Link

- **"A" Module or configurable I/O:** This module has 4 M12 ports and is powered by Logic Power. Each port has the following configurations:
  - i. 1 IO-Link class A master and pin 2 configurable as input or output
    OR
  - ii. 2 inputs, 24VDC (PNP or NPN)
    OR
  - iii. 2 outputs (Logic Power), 250mA @ 24VDC

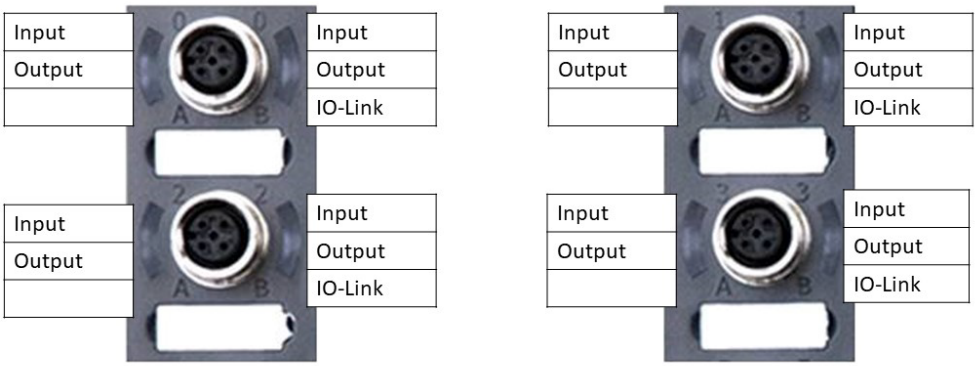
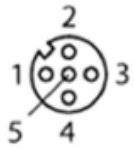


Figure 5 — IO-Link Class A

Table 7 — IO-Link A Port Details

Connector	Pin No.	Function
	1	+24V, 500mA VLOG (V1)
	2	Input (PNP or NPN)/Output +24V, 250 mA (V1)
	3	GND (V1)
	4	IO-Link/Input (PNP or NPN)/Output +24V, 250mA (V1)
	5	Not Connected

- **"B" Module or configurable I/O:** This module has 4 M12 ports. Each port has the following configurations:
  - i. IO-Link class B master
    OR
  - ii. 1 input, 24VDC (PNP or NPN), PIN 4
    OR
  - iii. 1 output (Logic Power), 250mA @ 24VDC, PIN 4

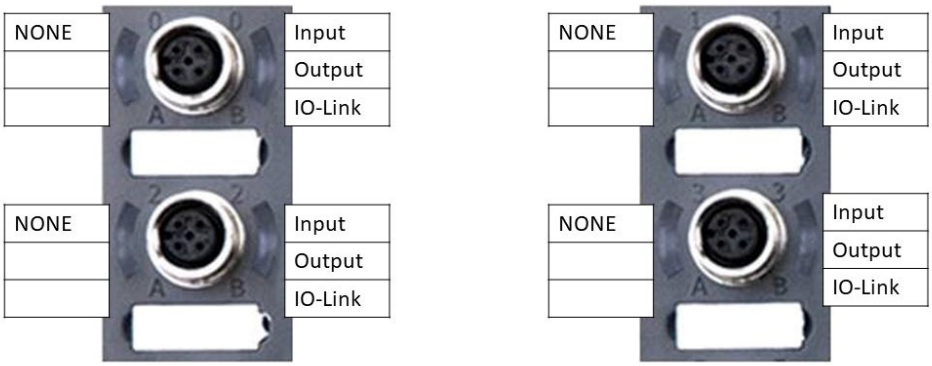
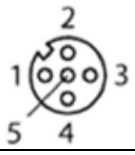


Figure 6 — IO-Link Class B

Table 8 — IO-Link B Port Details

Connector	Pin No.	Function
	1	+24V, 250mA VLOG (V1)
	2	+24V, 1.2A VAUX (V2)
	3	GND (V1)
	4	IO-Link/Input (PNP or NPN)/Output +24V, 250mA (V1)
	5	GND (V2)

- **“C” Module or configurable I/O with Aux Outputs:** This module has 4 M12 ports. Each port has the following configurations:
    - i. 2 M12 ports with Digital Output.
        - a. 2 outputs (Aux Power), 500mA @ 24VDC
    - ii. 2 M12 ports with each port having the following configuration:
        - a. 1 IO-Link class B master
          OR
        - b. 1 input, 24VDC (PNP or NPN), PIN 4
          OR
        - c. 1 output (Logic Power), 250mA @ 24VDC, PIN 4

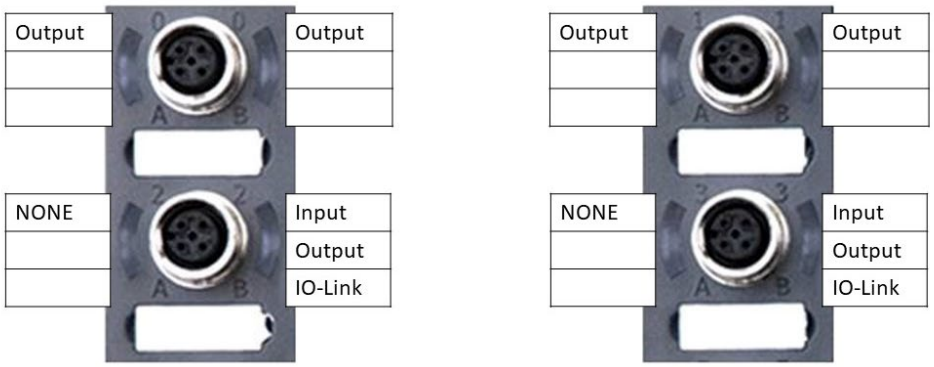
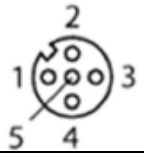


Figure 7 — IO-Link Class B+

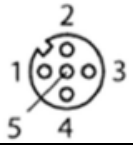
A. Aux Output Port Details (Port 1 and 2 of this Module)

Table 9 — Aux Output Port Details

Connector	Pin No.	Function
	1	Not Connected
	2	Output +24VAUX (V2), 500mA
	3	GND (V2)
	4	Output +24VAUX (V2), 500mA
	5	Not Connected

B. IO-Link B+ class B Port Details (Port 3 and 4 of this Module)

Table 10 — IO-Link B+ class B Port Details

Connector	Pin No.	Function
	1	+24V, 250mA VLOG (V1)
	2	+24V, 1.2A VAUX (V2)
	3	GND (V1)
	4	IO-Link/Input (PNP or NPN)/Output +24V, 250 mA (V1)
	5	GND (V2)

2.6 Status LEDs / Bluetooth Enable Button

Status LEDs: The LED's are used to indicate the status of Aux Power (AP), Logic Power (LP), Bluetooth Module Status (BT), Network Status (NS), Module Status (MS), Device Status (DS), Network Port 1 Link/Activity (NT1) and Network Port 2 Link/Activity (NT2).

Bluetooth Enable Button: Press and hold this button for more than 3 seconds to enable/disable the Bluetooth functionality. The Bluetooth communication is used to connect to PCH Portal via Bluetooth mobile application and PC Configuration Tool (reference Chapter 5). To connect using PC Configuration Tool over Bluetooth, a low energy Bluetooth (BLE) USB Dongle must be connected to a USB port of PC or Laptop.

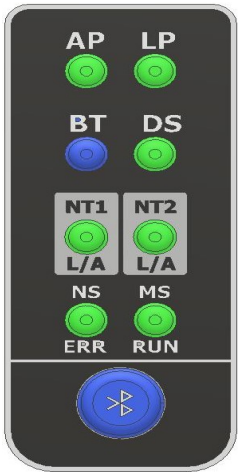


Figure 8 — Status LEDs / Bluetooth Enable button

The following table gives the status indication of the Aux Power, Logic Power, Bluetooth, Device and Network ports.

Table 11 — PCH Device LED Indication

LED Status Label	LED State	Description
Network Status (NS)	OFF	No Power, No IP Address assigned
	Solid Green	PCH device online, one or more connections with Scanner established
	Flashing Green	PCH device online, no connection with Scanner established
	Solid Red	Duplicate IP Address or Fatal Error
	Flashing Red	One or more connections with Scanner timed out
Module Status (MS)	OFF	No Power
	Solid Green	PCH device controlled by Scanner in RUN state
	Flashing Green	PCH device not configured or Scanner in IDLE state
	Solid Red	Major fault in the PCH device
	Flashing Red	Recoverable fault in the PCH device
Link Activity (L/A) LED for network port 1 and network port 2 (NT1, NT2)	OFF	No link, No activity
	Solid Green	100 Mbps link established
	Flashing Green	100 Mbps Network Activity
	Solid Yellow	10 Mbps link established
	Flashing Yellow	10 Mbps Network Activity
Bluetooth (BT)	OFF	Bluetooth communication OFF
	Solid Blue	Bluetooth module is communicating with PC Utility over Bluetooth Interface

LED Status Label	LED State	Description
	Flashing Blue	Bluetooth module is ON and waiting to be paired or Bluetooth module firmware upgrade in progress if Device status (DS) LED is flashing yellow
Auxiliary Power (AP)	Solid Red	Auxiliary Power below 19.4 V or above 29.4V
	Flashing Red	Auxiliary Power between 19.4V to 20.3V or 28.9V to 29.4V
	Solid Green	Auxiliary Power between 20.4 V to 28.8V
	Solid Magenta	Auxiliary Current above 12 Amps
Logic Power (LP)	OFF	Logic Power below 16V or above 29.4V
	Solid Red	Logic Power below 19.3V
	Flashing Red	Logic Power between 19.4V to 20.3V or 28.9V to 29.4V
	Solid Green	Logic Power between 20.4V to 28.8V
	Flashing Magenta	Logic current between 7.5 Amps to 8 Amps
	Solid Magenta	Logic current above 8 Amps
Device Status (DS)	Solid Green	Device in normal mode
	Flashing Green	Invalid IP Address/
	Flashing Yellow	Invalid Configuration from PLC
	Flashing Red	Invalid product code/Valve short circuit
	Solid Red	Internal error
	Solid Yellow	internal warning
	Solid Magenta	Module Error
	Flashing Magenta	Internal warning
	Flashing Cyan	Temperature between 75 °C to 80 °C/Reset to default in progress
	Solid Cyan	Temperature above 80 °C

2.7 USB connector and Rotary Switches

USB Connector: The USB 2.0 OTG, Type-B standard connector is used to interface with the configuration software. The configuration software is used to configure and monitor the PCH Portal product.

Rotary Switches: The Portal contains 3 rotary switches. These are used to set the last octet of the IP Address (assigning a static IP address), factory default, Enable FTP and DHCP mode.

The Rotary switches are housed besides the USB port.

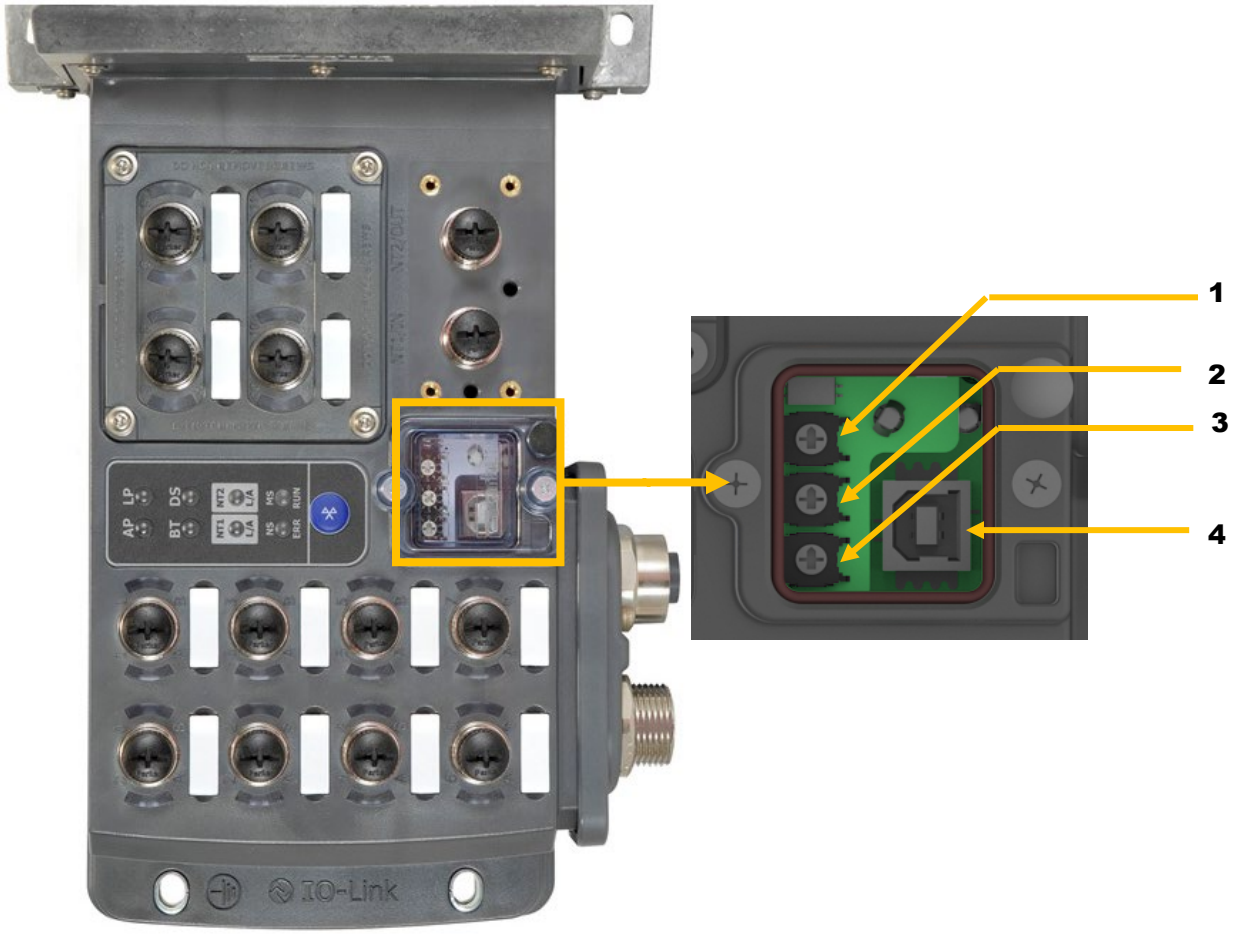


Figure 9 — USB Port and Rotary Switch Details

Table 12 — USB Port and Rotary Switch Details

Callout No.	Details
1	Rotary Switch x1
2	Rotary Switch x10
3	Rotary Switch x100
4	USB Port

The rotary switches are housed besides the USB port. The Rotary switches are used to configure the PCH Portal product for the following functionalities based on the rotary switch settings shown in Table 13.

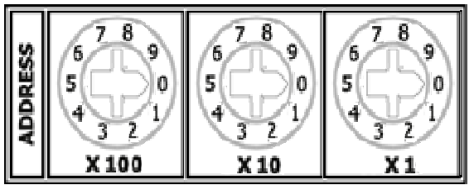


Figure 10 — Rotary Switch Configuration Details

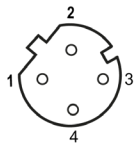
Table 13 — Rotary Switch Configuration Details

Rotary Switch Setting	Description
001 – 254	A setting of 001 to 254 on rotary switch and power cycle of PCH Portal enables the PCH device to use static IP address. The last octet of the IP address is as per the rotary switch setting and the first three octets is as configured in config utility over USB and web interface. (Factory Default: IP: 192.168.1.8)
333	A setting of 333 on the rotary switch and power cycle of the PCH Portal allows the config utility over USB and web interface to configure all four octets of IP address of the PCH Portal. After IP address configuration through utility, power cycle of PCH Portal once again results in PCH Portal to boot-up with IP address configured using the config tool.
387	Enable FTP
888	A setting of 888 on the rotary switch and power cycle of the PCH Portal configure the PCH Portal to use IP address assigned by DHCP server.
999	A setting of 999 on the rotary switch and power cycling the PCH Portal resets all the configuration data to the factory default. IP 192.168.1.8
Out of range	**Note:** A setting on rotary switch other than 001 to 254, 333, 387, 888and 999 will result in the PCH Portal boot-up with last good IP address and the Device Status LED will be blinking GREEN which will indicate IP address out of range. The last good IP address is the IP address used by the PCH Portal before last reset.

2.8 Network Communication Ports NT1 and NT2:

The Network Communication Ports are used to connect the PCH Portal to external devices in the automation system.

Table 14 — Network Interface

M12, D-coded, female	Pin No.	Function
	1	Tx+
	2	Rx+
	3	Tx-
	4	Rx-

2.9 Connection to H Universal Air Supply:

There are 2 connectors (30 pin and 10 pin) for up to 32 valves. 24valves can be connected to 30pin connectors and 8valves can be connected to 10-pin connector. Each valve output has a maximum of 160mA at 24V.

Valve Output Pinout:

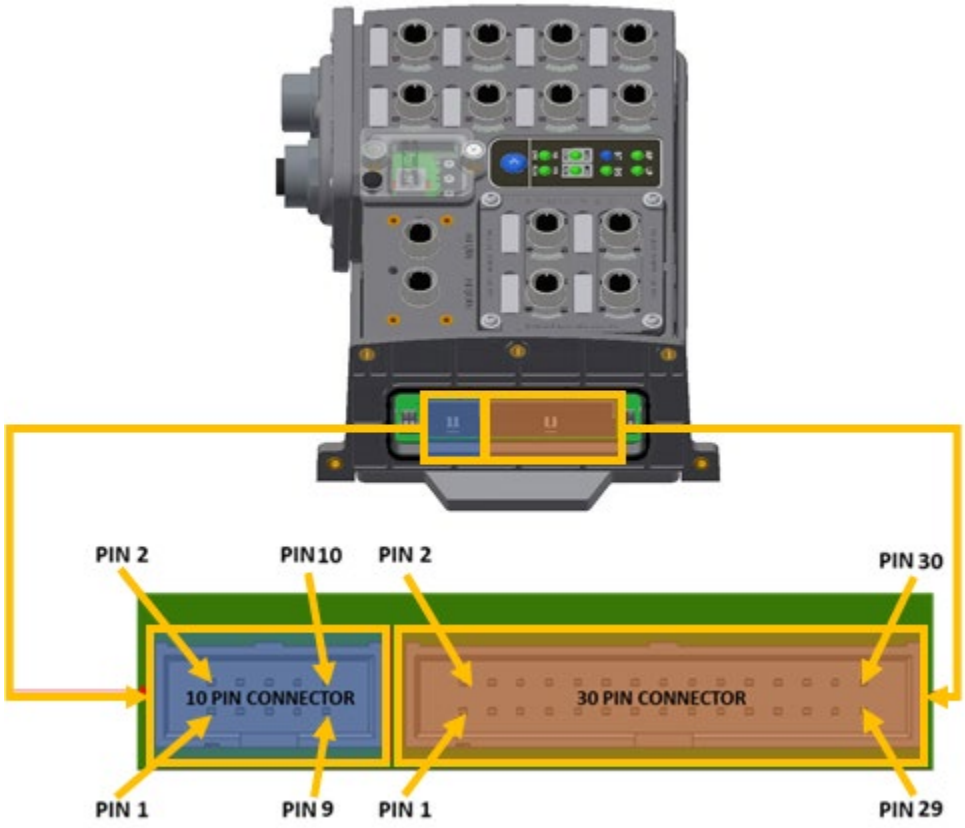


Figure 11 — Valve Output Pinout

Table 15 — Valve Output Pinout Details

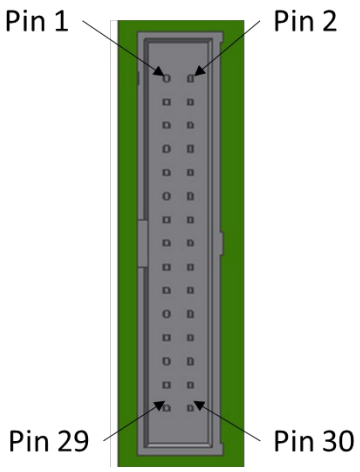
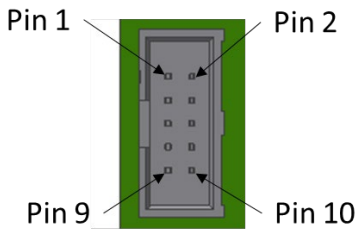
Connector	Pin Number	Function
	1	GND V2/Safe GND 1
	2	GND V2/Safe GND 1
	3	GND V2/Safe GND 1
	4	GND V2/Safe GND 1
	5	GND V2/Safe GND 1
	6	Protective Earth
	7	VALVE_OUT0
	8	VALVE_OUT1
	9	VALVE_OUT2
	10	VALVE_OUT3
	11	VALVE_OUT4
	12	VALVE_OUT5
	13	VALVE_OUT6
	14	VALVE_OUT7
	15	VALVE_OUT8
	16	VALVE_OUT9
	17	VALVE_OUT10
	18	VALVE_OUT11
	19	VALVE_OUT12
	20	VALVE_OUT13
	21	VALVE_OUT14
	22	VALVE_OUT15
	23	VALVE_OUT16
	24	VALVE_OUT17
	25	VALVE_OUT18
	26	VALVE_OUT19
	27	VALVE_OUT20
	28	VALVE_OUT21
	29	VALVE_OUT22
	30	VALVE_OUT23

Table 16 — Valve Output Pinout Details

Connector	Pin Number	Function
	1	GND V2/Safe GND 2
	2	GND V2/Safe GND 2
	3	VALVE_OUT24
	4	VALVE_OUT25
	5	VALVE_OUT26
	6	VALVE_OUT27
	7	VALVE_OUT28
	8	VALVE_OUT29
	9	VALVE_OUT30
	10	VALVE_OUT31

NOTE: The valve outputs operate on aux voltage and have latching behavior. In case the logic voltage drops below operating range (< 16 V or > 30V), the valve outputs remain latched to the state they were set to when the PCH Portal logic supply was in operating range.

CAUTION: To comply with the protection class IP65, seal the unused ports with the appropriate plugs or cover caps.

- The PCH Network Portal can used the following H ISO Universal Valves:
  - ISO 15407-2 – sizes 02 & 01
  - ISO 5599-2 – sizes 1, 2 & 3
- The PCH Network Portal can support up to 32 addresses as shown
- The data map and PCH Tool refers to each address with a Valve_X designator. Each Valve_X designator is as shown.
- Addresses 25-31 can be accessed using an Intermediate Air Supply with Electric Expansion
- Each address is one solenoid

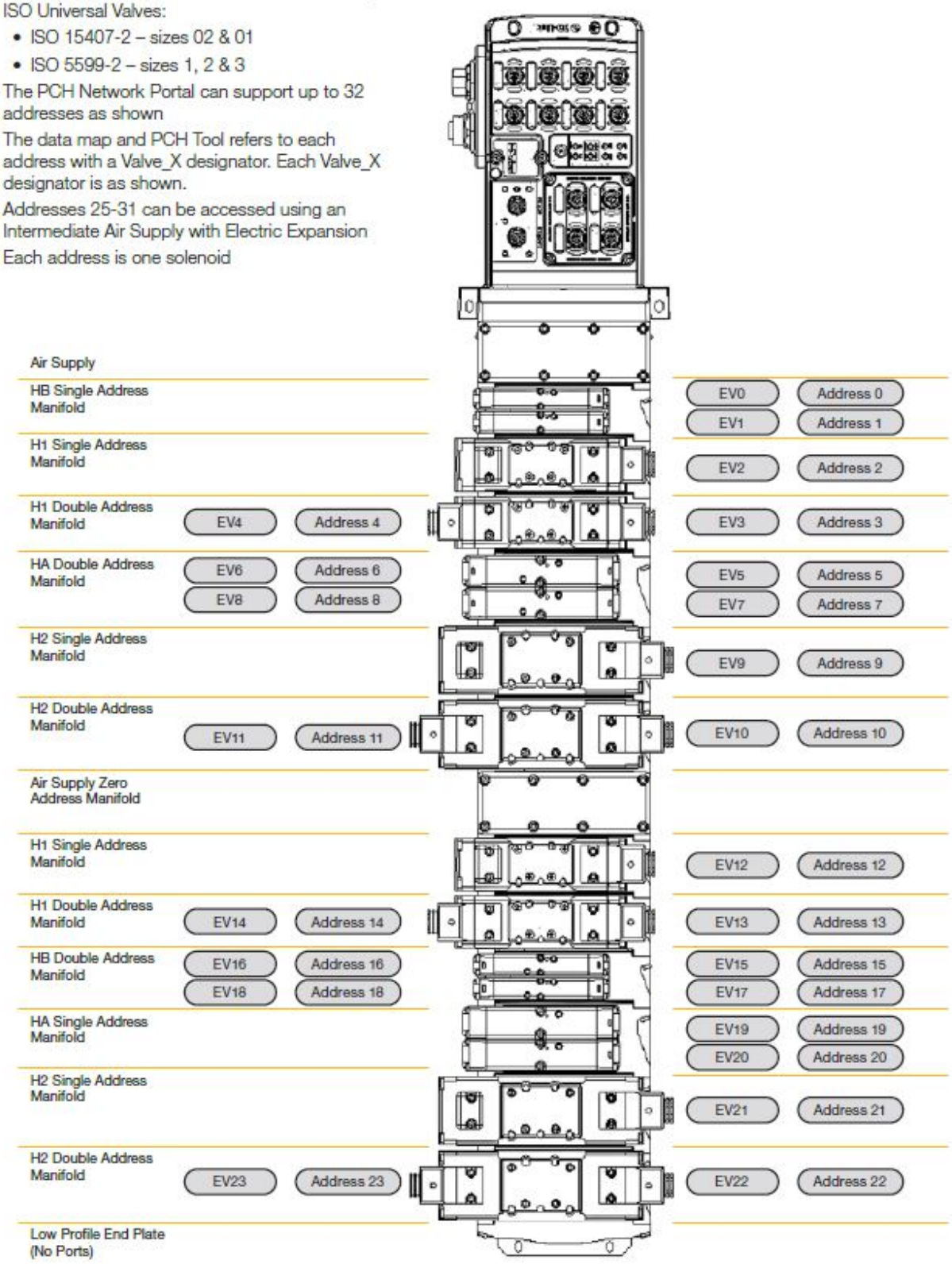


Figure 12 — Solenoid Addressing

2.10 Port and Port LED Descriptions

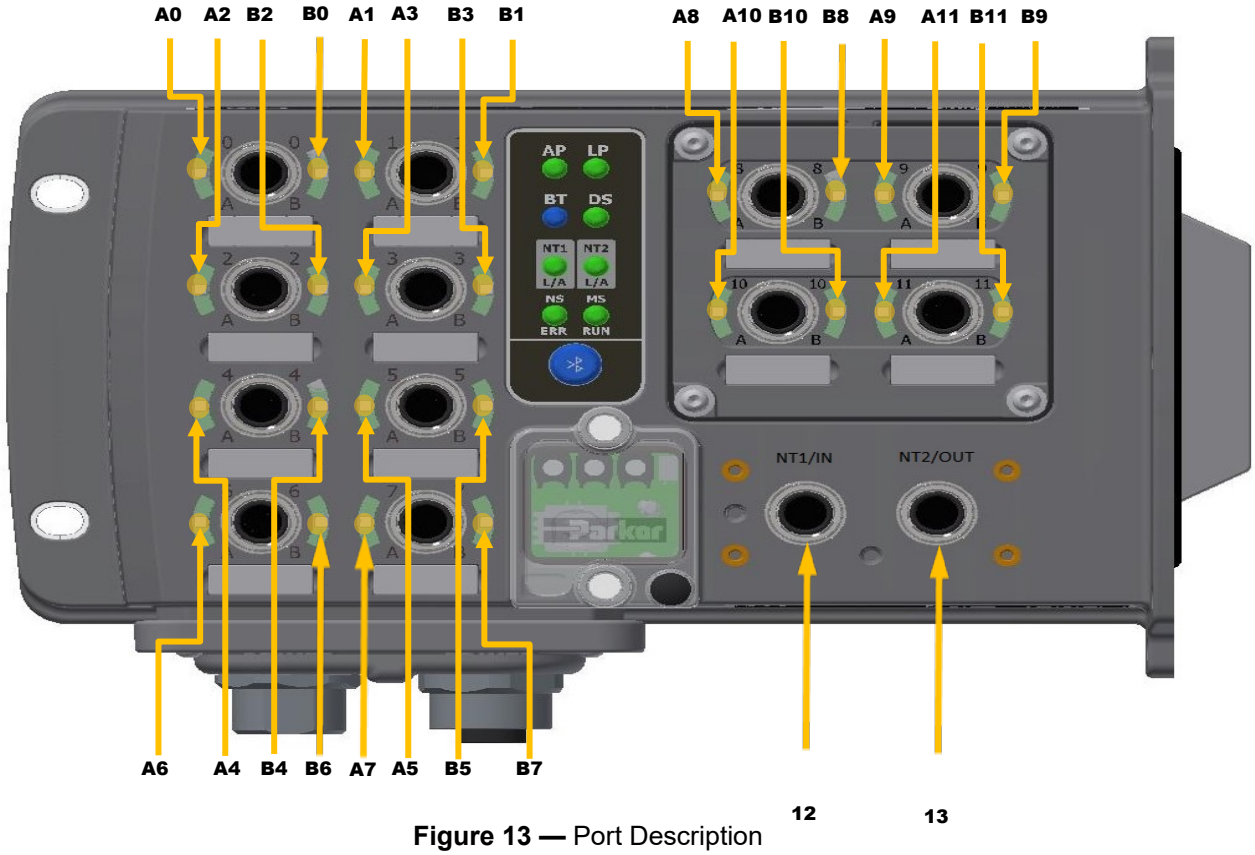


Figure 13 — Port Description

Table 17 — Port Description

Port Description			Port Description	
Callout No.	**Port Number**		**Callout No.**	**Port Number**
A0 (Channel 0)	Port 0/A (Pin 2)		B6 (Channel 13)	Port 6/B (Pin 4)
B0 (Channel 1)	Port 0/B (Pin 4)		A7 (Channel 14)	Port 7/A (Pin 2)
A1 (Channel 2)	Port 1/A (Pin 2)		B7 (Channel 15)	Port 7/B (Pin 4)
B1 (Channel 3)	Port 1/B (Pin 4)		A8 (Channel 16)	Port 8/A (Pin 2)
A2 (Channel 4)	Port 2/A (Pin 2)		B8 (Channel 17)	Port 8/B (Pin 4)
B2 (Channel 5)	Port 2/B (Pin 4)		A9 (Channel 18)	Port 9/A (Pin 2)
A3 (Channel 6)	Port 3/A (Pin 2)		B9 (Channel 19)	Port 9/B (Pin 4)
B3 (Channel 7)	Port 3/B (Pin 4)		A10 (Channel 20)	Port 10/A (Pin 2)
A4 (Channel 8)	Port 4/A (Pin 2)		B10 (Channel 21)	Port 10/B (Pin 4)
B4 (Channel 9)	Port 4/B (Pin 4)		A11 (Channel 22)	Port 11/A (Pin 2)
A5 (Channel 10)	Port 5/A (Pin 2)		B11(Channel 23)	Port 11/B (Pin 4)
B5 (Channel 11)	Port 5/B (Pin 4)		12	Ethernet Port 1 (NT1)
A6 (Channel 12)	Port 6/A (Pin 2)		13	Ethernet Port 2 (NT2)

2.11 IO Port LED Indication

Each of the Ports have two LEDs to indicate the I/O-States that are configured.

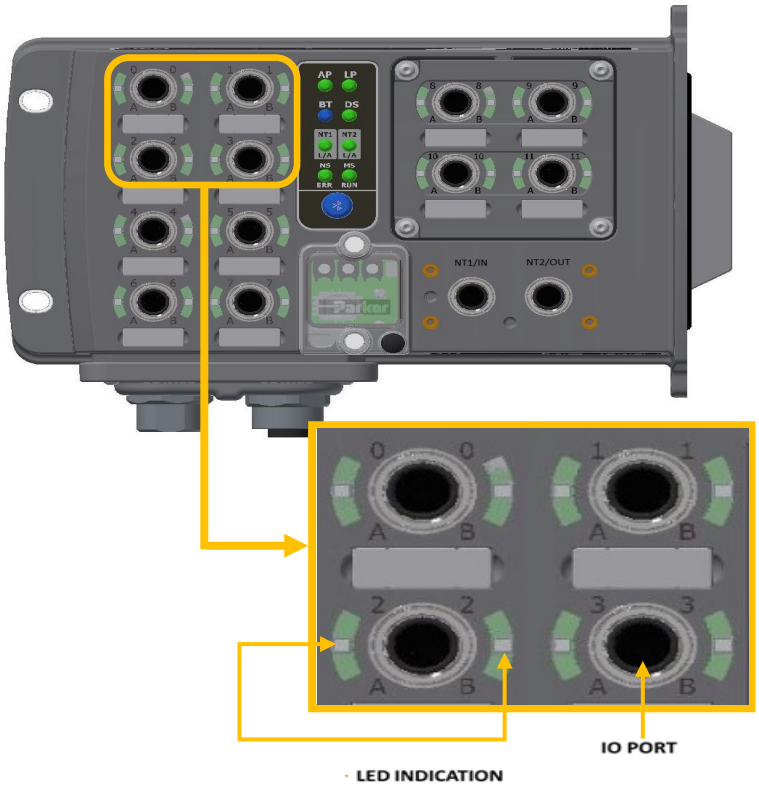


Figure 14 — IO-Port LED

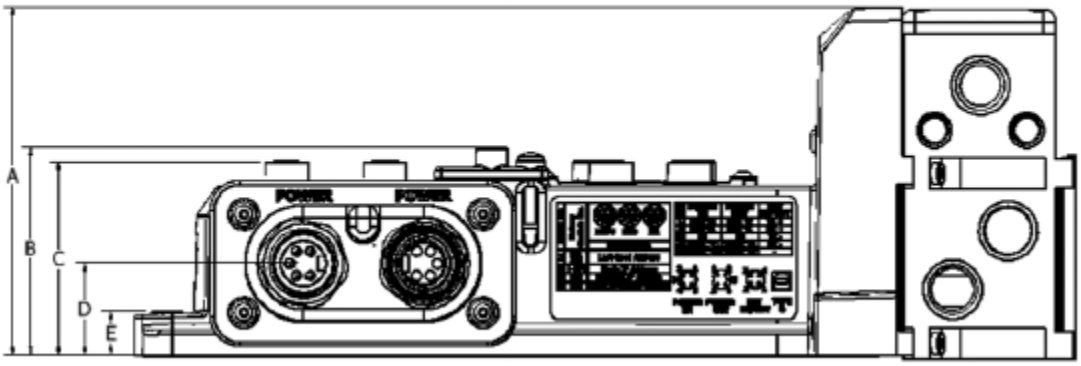
Table 18 — IO Port LED Indication

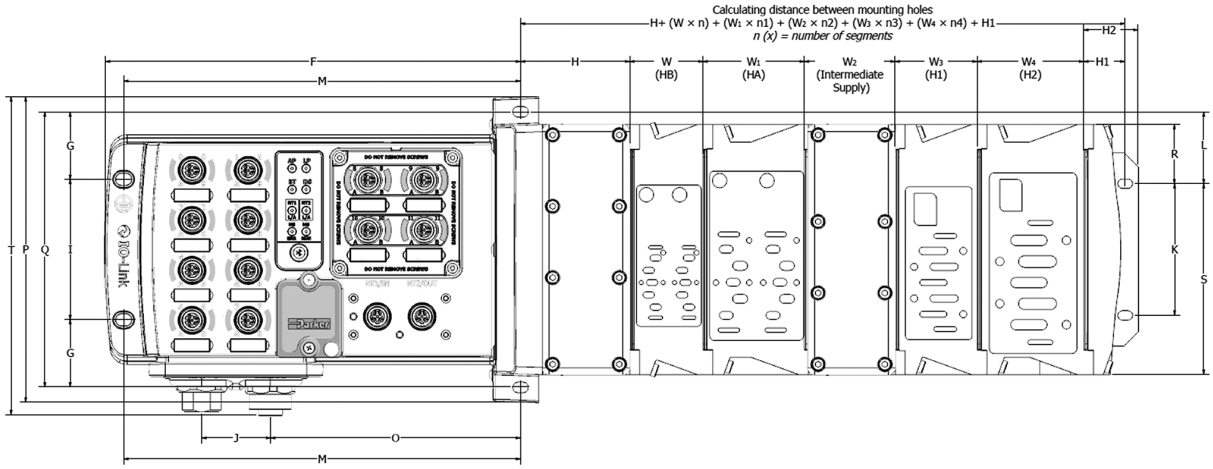
Color Indication	Status
OFF	Input is configured and input is OFF
Light Blue	Output is configured and output is OFF (Type A module) or I/O is not configurable (Type B module)
Yellow	Input is ON or Output is actuated
Yellow flashing	During firmware upgrade
Red	Over current at I/O or IO-Link point
Red flashing	Short-circuit at supply/Validation Error/Data Storage Error/
Green	IO-Link Configured and IO-Link slave connected
Green rapid flashing	IO-Link port is getting configured
Green flashing	IO-Link Configured and IO-Link slave not connected
Magenta	The application image present in flash is not valid
Magenta flashing	Watchdog error

CHAPTER - 3 **Technical Data**

3.1 Dimensions

Footprint dimensions: length, width, height of entire PCH





n (x) = number of segments

A	B	C	D	E	F	G	H	H1	H2	J	K	L
4.42 (112.3)	2.64 (67.1)	2.46 (62.5)	1.17 (29.7)	.55 (14)	9.32 (236.7)	1.51 (38.4)	2.36 (59.9)	.9 (22.9)	1.22 (31)	1.55 (39.4)	2.95 (74.9)	1.6 (40.6)

M	O	P	Q	R	S	T	W	W1	W2	W3	W4
8.91 (226.3)	5.61 (142.5)	6.86 (174.2)	6.18 (157)	1.33 (33.8)	4.28 (108.7)	7.14 (181.4)	1.63 (41.4)	2.28 (57.9)	2.03 (51.6)	1.82 (46.2)	2.39 (60.7)

Inches (mm)

Mounting holes dimensions

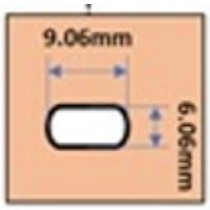


Figure 15 — Physical Dimensions

3.2 Mechanical Data

Table 19 — Mechanical Data

Parameters	Details
Housing material	Housing /Enclosure: PBT with 33% GF and UL94-V0Base Cover (plate): Aluminum 380
Enclosure rating	IP 65 (only when plugged-in and threaded-in)
Supply Voltage	7/8” 4 or 5 pin male and female pin connector
Input ports/ Output ports	M12, A-coded (12 x female)
Dimensions (L x Bx H in mm)	226.6mm x 130.7mm x 55mm
Mounting type	Screw Mount
Ground strap attachment	M5
Weight	Approx. 1.3 kg

3.3 Operating Conditions

Table 20 — Operating Conditions

Parameters	Details
Operating Temperature	0°C to 50°C
Storage Temperature	-25°C to 70°C
Industrial Immunity	IEC 61000-6-2
Industrial Emission	IEC 61000-6-4
Shock/Vibrations	IEC 60068-2-27:2008
	IEC 60068-2-6:2007
Electrostatic Discharge	IEC 61000-4-2
Electrical Fast Transient/ Burst	IEC 61000-4-4
Surge Immunity	IEC 61000-4-5

3.4 Electrical Data

Table 21 — Electrical Data

Topic	Details
Supply Voltage	24VDC (-15% to +20%)
Logic current at 24 V (V1)	Max Current 8A – Actual usage depends on configuration.
Auxiliary current at 24 V (V2)	Max Current 12A – Actual usage depends on configuration.
Input current at 24V (Zone 1-3)	Max Current 3.84A – Actual usage depends on configuration.
Input current at 24V (Zone 4)	Max Current 1.28A – Actual usage depends on configuration

CHAPTER - 4 **PCH Portal Function**

4.1 Integration

4.1.1 Integration in Rockwell RS Logix 5000

4.1.1.1 Register EDS files

Step 1: Select Tools->EDS Hardware Installation Tool.

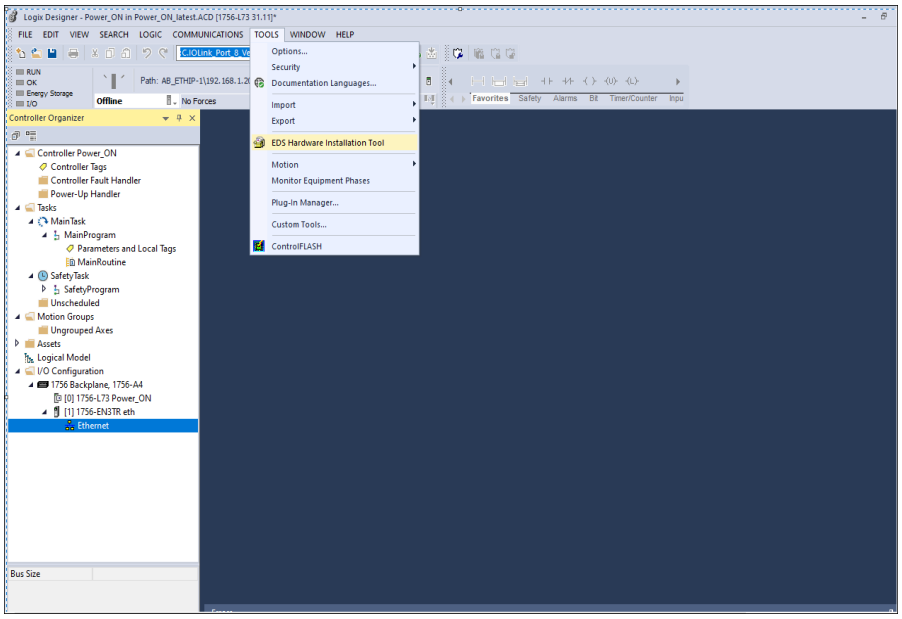


Figure 16 — Register EDS files

Step 2: Once EDS Wizard dialog box opens, click on Next.

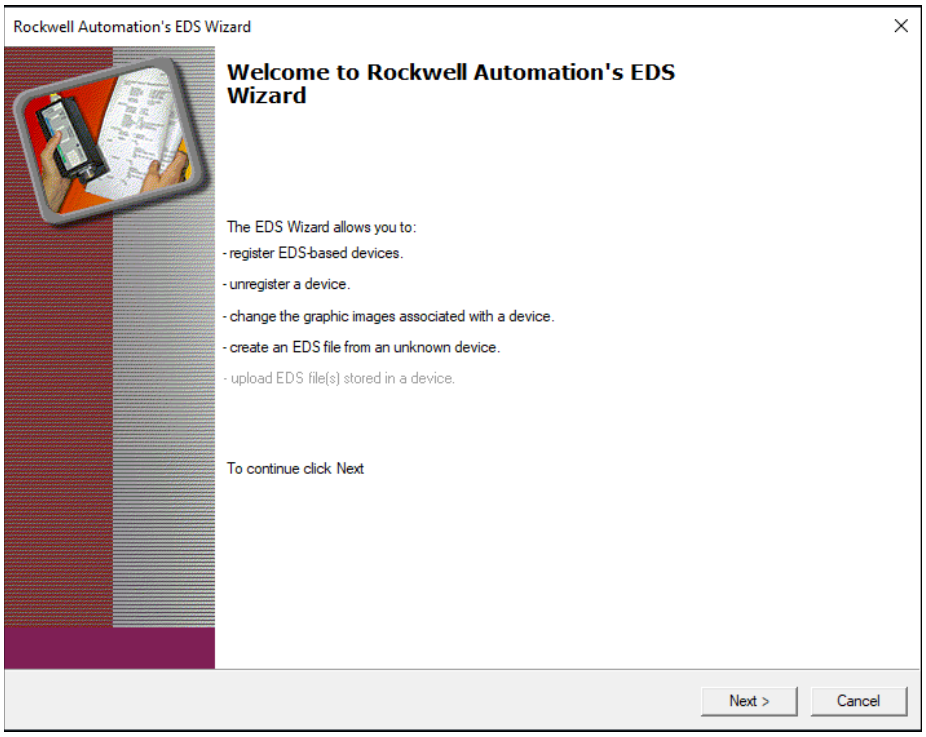


Figure 17 — EDS Wizard

Step 3: Select Register an EDS file(s) and click on Next as shown below:

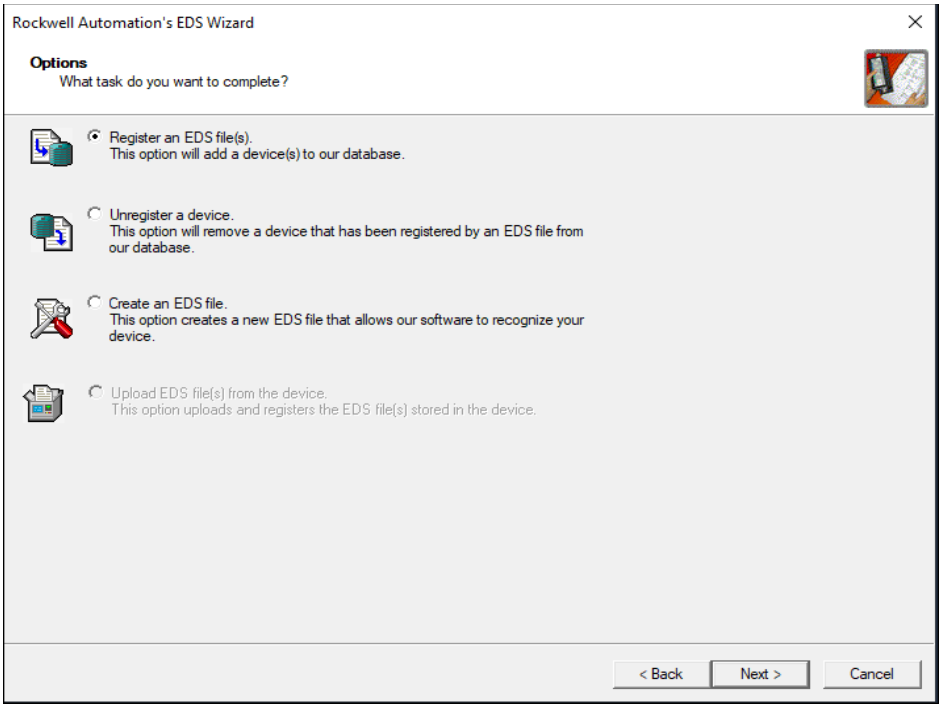


Figure 18 — EDS Wizard

Step 4: Select "Register a directory of EDS files" option to load all the PCH device EDS files. Click on Browse and select the folder where EDS files are stored and click Next.

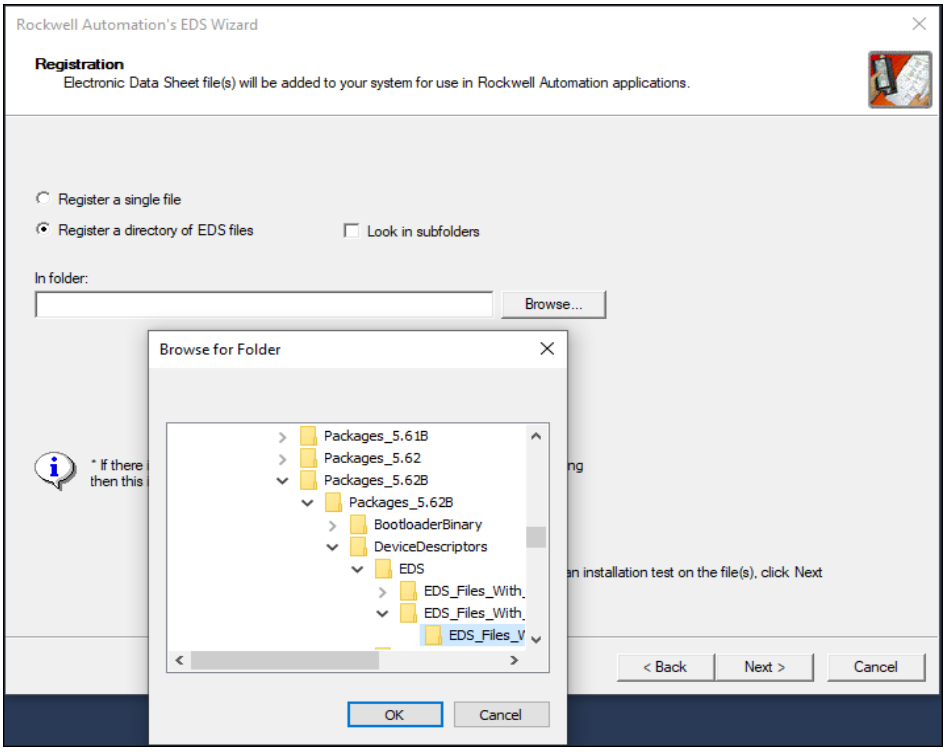


Figure 19 — Select EDS files

Step 5: Once all EDS files are evaluated, Click on Next.

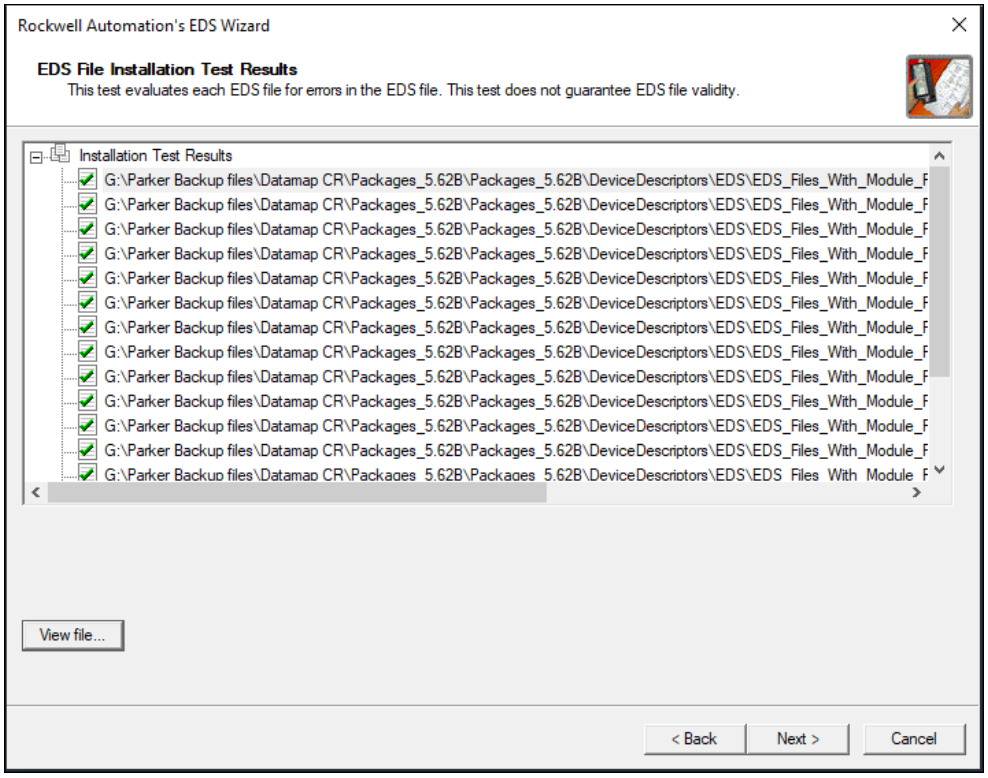


Figure 20 — EDS Files Verification

Step 6: Verify the Device image icon and Click on Next.

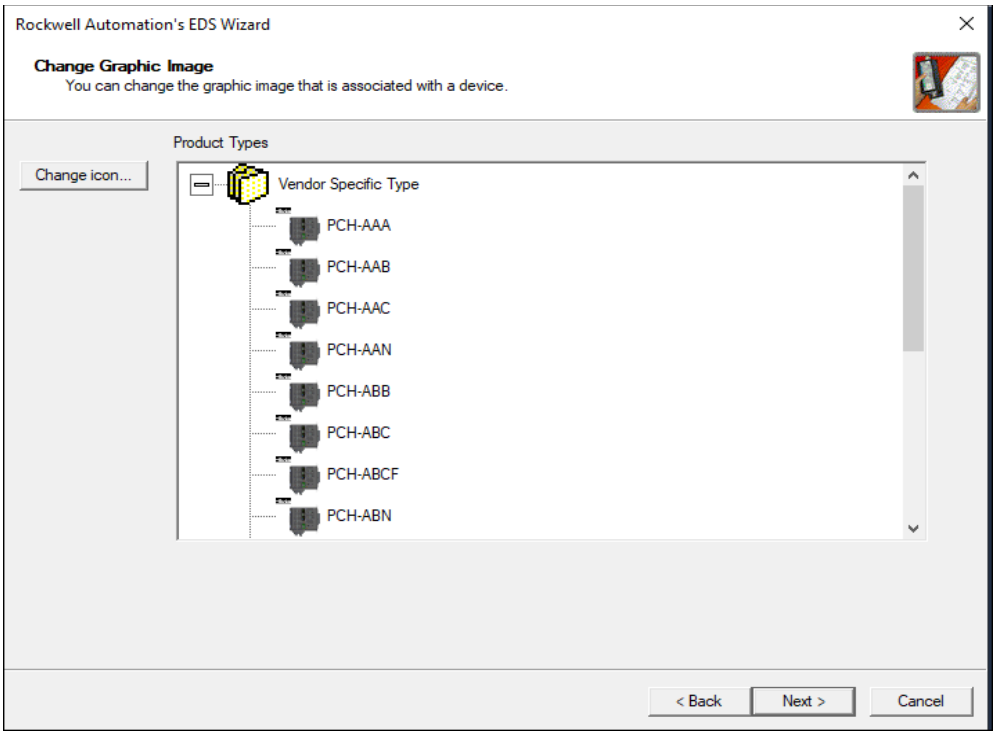


Figure 21 — Device image icon

Step 7: Verify the catalog number of the EDS file and Click on Next.

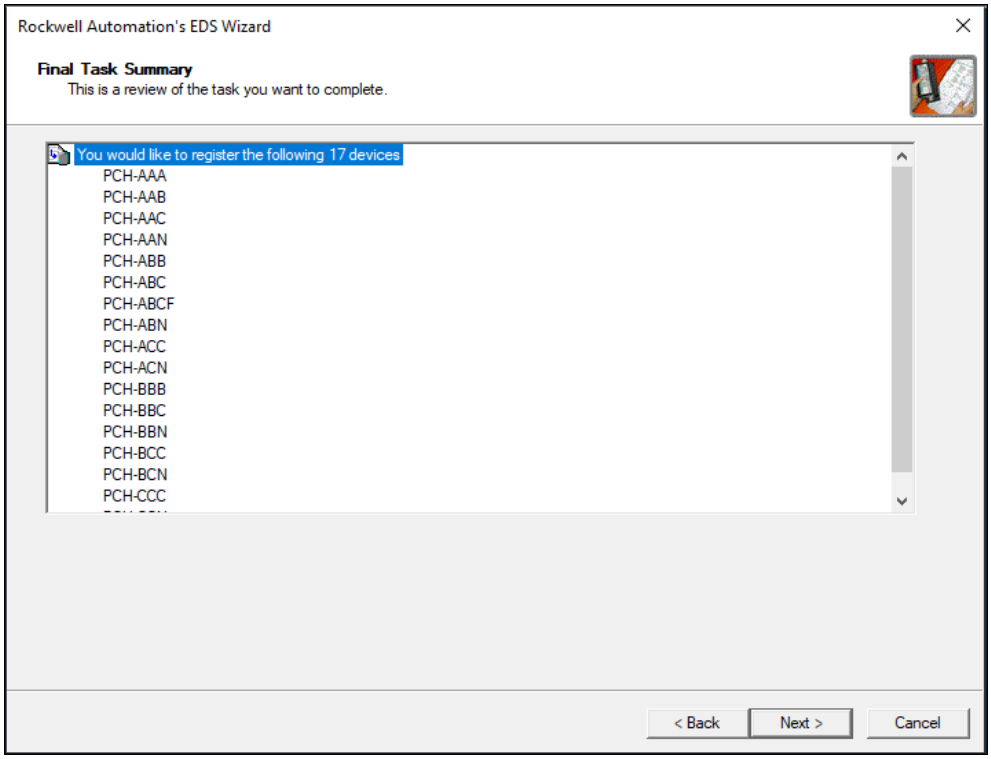


Figure 22 — Catalog Verification

Step 8: Click on Finish to complete the EDS registration.

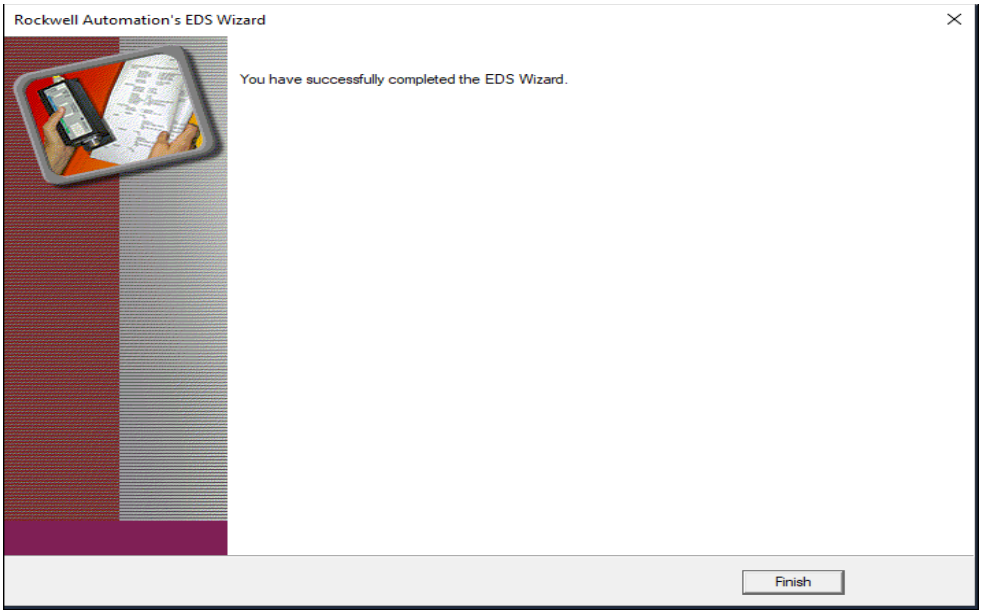


Figure 23 — EDS Wizard

At this moment, all the selected EDS files have been registered in the Studio 5000.

4.1.1.2 Add product to the project with the following steps:

Step 1: Left click on Ethernet and select New Module

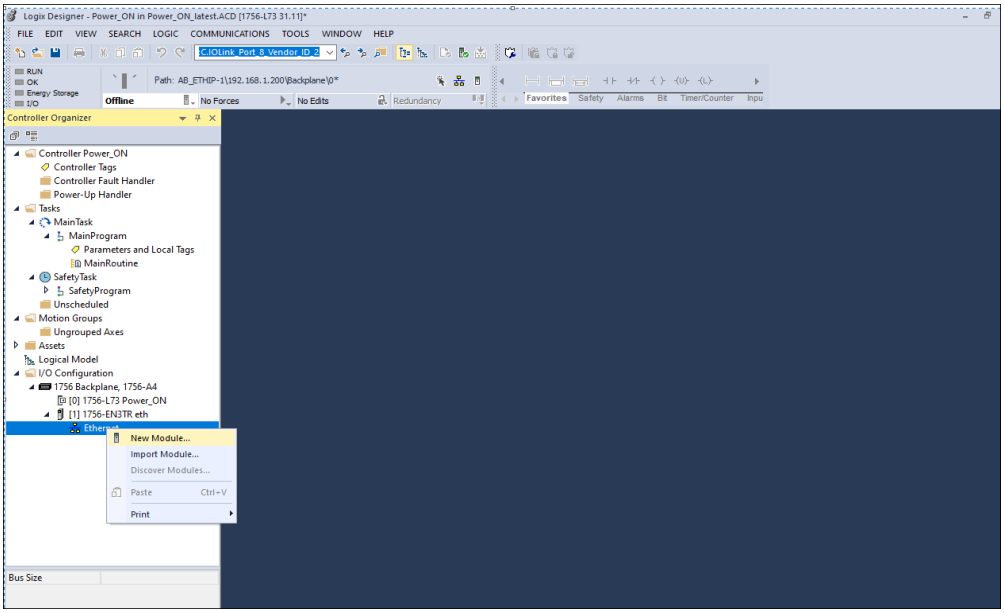


Figure 24 — Addition of New Module

Step 2: Select the Module Type: A window opens, search for desired product by mentioning the catalog number. After selecting the desired product, click on Create.

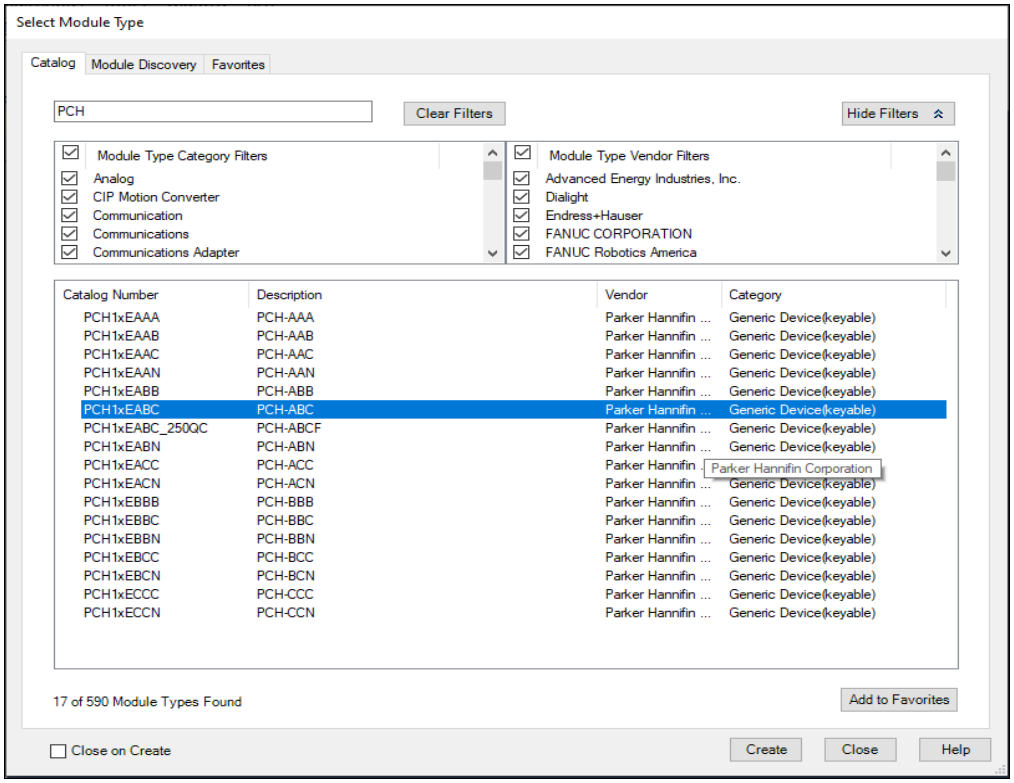


Figure 25 — Module Type Selection

Step 3: New Module window opens, enter the desired Device Name, IP address and the connection required

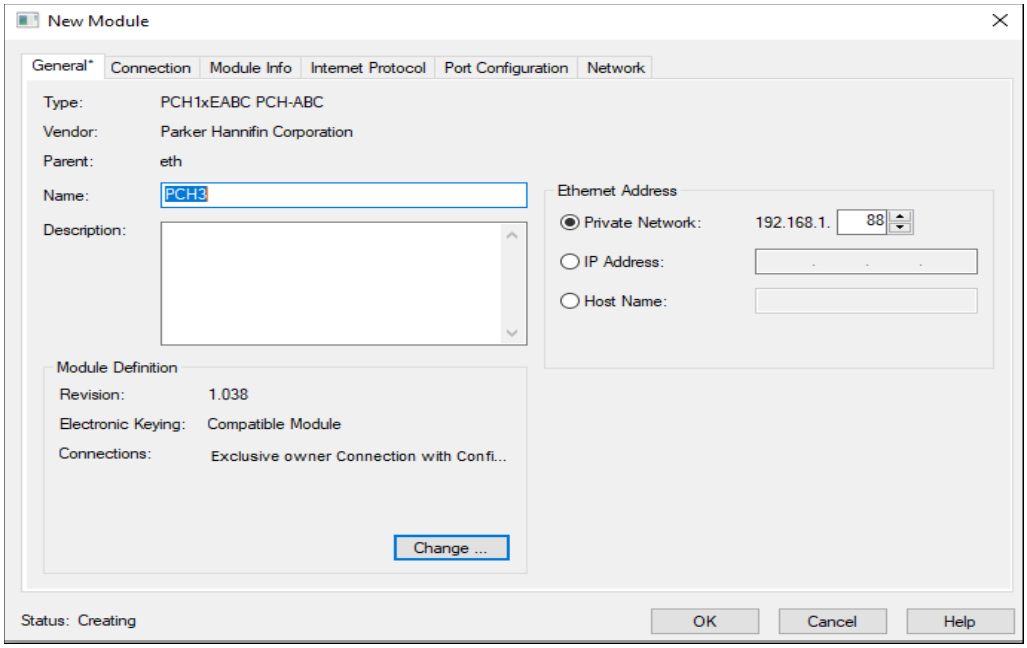


Figure 26 — Creating of New Module

Step 4: Click OK, the new module and the corresponding controller tags are generated automatically.

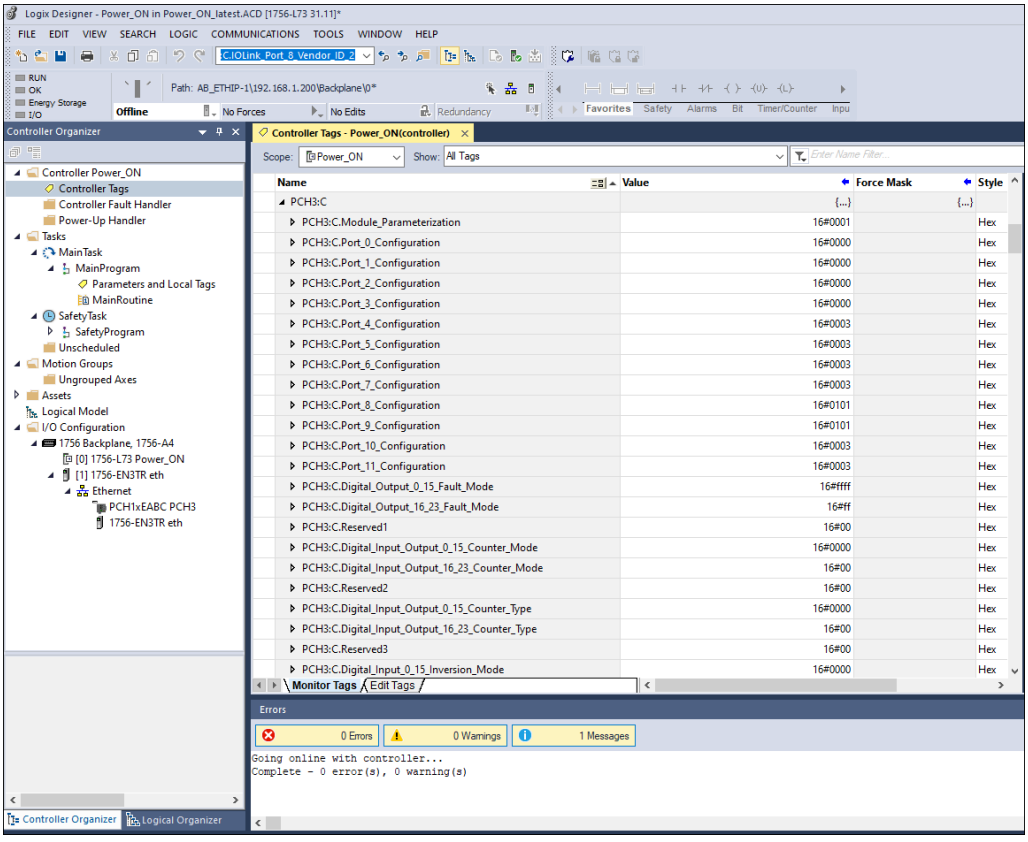


Figure 27 — Controller Tags

Step 5: Download the project to the PLC.

NOTE: If CONFIGURATION DATA is changed you will have to cycle power on the PCH Portal module in order for the new configuration data to be downloaded to the PCH Portal module.
You can also “Inhibit” and then “Un-Inhibit” the PCH Portal connection in the I/O Configuration of RSLogix.

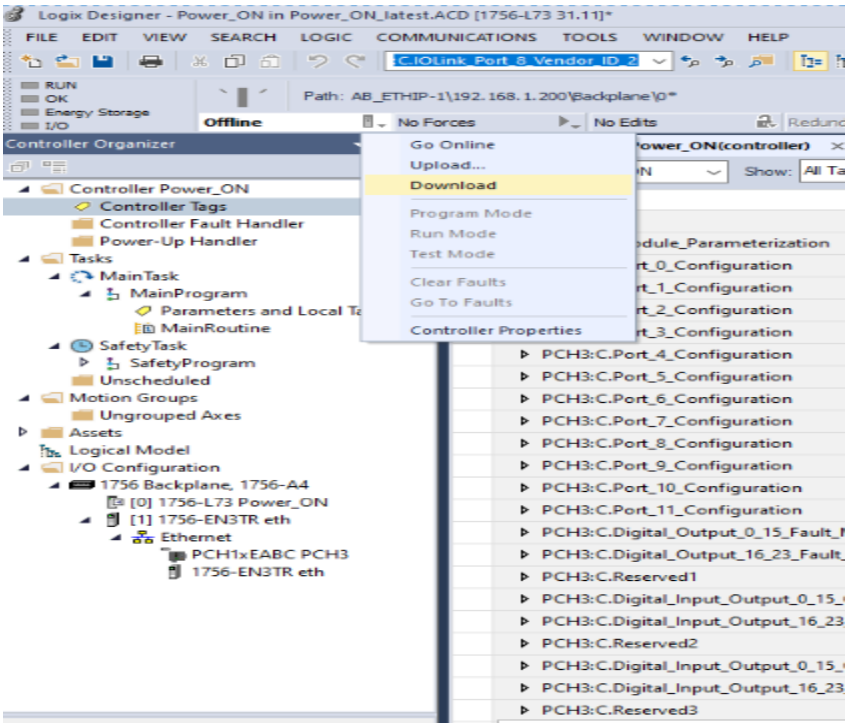


Figure 28 — Configuration Download

Step 6: Once the download is done, you can observe and control the tags using the Controller Tags option.
Make sure you select the correct tag name, which you configured beforehand. The input, output and configuration data for this is described on the following pages. You can use these tags for the programming, too.

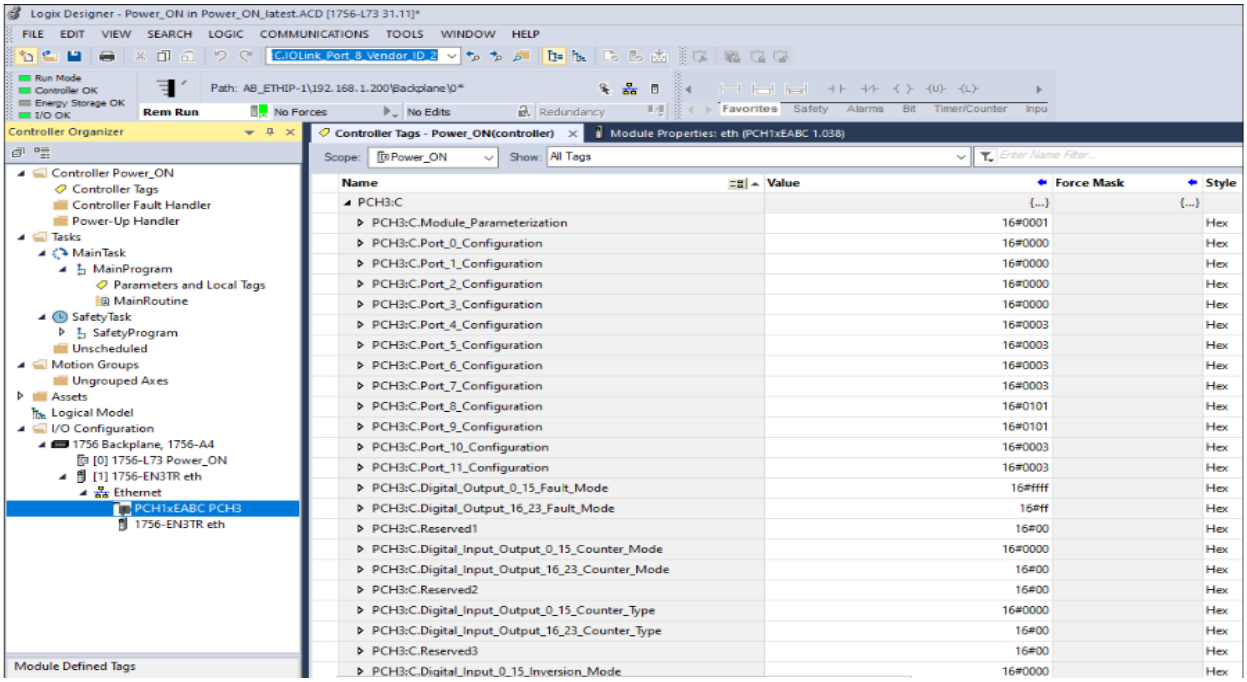


Figure 29 — Controller Tag

4.2 Ethernet/IP Connections

4.2.1 Types of Connections

The PCH Portal supports four types of Ethernet/IP connections, namely Connection 1, Connection 2, Connection 3 and Connection 4. Four connections are supported to address the different use cases and to provide some flexibility on process data mapping. Each connection is described below with typical use case.

Connection 1: This is a fixed map, all the process data supported by the device is mapped into fixed locations. The map remains fixed irrespective of the device port configurations. Connection 1 will be used whenever the PCH configuration is done via PLC/controller.

Table 22 — Connection 1 Assemblies

Mode	Instance ID	Data Length (Max. Bytes)
Input	100	500
Output	150	492
Configuration	5	390

Connection 2: This is a fixed map like Connection1, except, this connection does not need configuration data to be supplied while opening connection. Connection assumes that the device is already configured. Connection 2 will be used whenever the PCH configuration is performed via PC configuration Tool or webserver (Refer to Chapter 5).

Table 23 — Connection 2 Assemblies

Mode	Instance ID	Data Length (Max. Bytes)
Input	101	500
Output	102	492
Configuration	5	0

Connection 3: This is a flexible map and tries to utilize the available process data space efficiently. This is useful when there is limited amount of process data supported by PLC/Controller. 4 IO-Link ports are supported with this connection

Table 24 — Connection 3 Assemblies

Mode	Instance ID	Data Length (Max. Bytes)
Input	103	168
Output	104	136
Configuration	5	390

Connection 4: This is a fixed map and dedicated for Specialized Quick-Connect applications. No IO-Link ports are supported with this connection.

Table 25 — Connection 4 Assemblies

Mode	Instance ID	Data Length (Max. Bytes)
Input	101	16
Output	102	8
Configuration	103	38

4.2.2 Configuration Data Assembly

The following information describes the configuration data for EtherNet/IP Connection 1 and Connection 3 options.

Table 26 — Port Configuration Information

Actual Byte Number	Configuration Parameter	Configuration of Port Pins								Description
		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
		D7	D6	D5	D4	D3	D2	D1	D0	
0	**Parameterization**	Module Parameterization								0 - Disable 1 – Enable When Module Parameterization is enabled, the configuration data provided in configuration assembly will be used. If disabled, PCH device will reject the configuration assembly data
1		RESV								
2	**Configuration for IO-Link Port**	Port 0 Configuration (A0 = low byte, B0 = high byte)								Each port has 2 pins (A – Pin 2 and B – Pin 4) Definition of A and B pins: Input PNP =0x00 Input NPN =0x04 Output = 0x01 IO-Link = 0x02 None = 0x03
3										
4		Port 1 Configuration (A1 = low byte, B1 = high byte)								
5										
6		Port 2 Configuration (A2 = low byte, B2 = high byte)								
7										
8		Port 3 Configuration (A3 = low byte, B3 = high byte)								
9										
10		Port 4 Configuration (A4 = low byte, B4 = high byte)								
11										
12		Port 5 Configuration (A5 = low byte, B5 = high byte)								
13										
14		Port 6 Configuration (A6 = low byte, B6 = high byte)								
15										
16		Port 7 Configuration (A7 = low byte, B7 = high byte)								
17										
18		Port 8 Configuration (A8 = low byte, B8 = high byte)								
19										
20		Port 9 Configuration (A9 = low byte, B9 = high byte)								
21										
22		Port 10 Configuration (A10 = low byte, B10 = high byte)								
23										
24		Port 11 Configuration (A11 = low byte, B11 = high byte)								
25										

Note:
Make sure desired values are entered for configurable ports.
For non-configurable ports, values can be set to 0x00.

Table 27 — Fault Mode Information

Actual Byte Number	Fault Mode								Description
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
	D7	D6	D5	D4	D3	D2	D1	D0	
26	Port 3/B	Port 3/A	Port 2/B	Port 2/A	Port 1/B	Port 1/A	Port 0/B	Port 0/A	0 - OFF 1 - Last Good
27	Port 7/B	Port 7/A	Port 6/B	Port 6/A	Port 5/B	Port 5/A	Port 4/B	Port 4/A	
28	Port 11/B	Port 11/A	Port 10/B	Port 10/A	Port 9/B	Port 9/A	Port 8/B	Port 8/A	
29	RESERVED								

Fault Mode (FM): This parameter defines the output state in case of communication fault with PLC or Backplane communication fault.
Last Good – Output will be maintained in last known good state in case of communication fault
OFF – Output will be turned off in case of communication fault

Table 28 — Byte DIO Counter Control (Warning Mode) Information

Actual Byte Number	DIO Counter Control (Warning Mode)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
	D7	D6	D5	D4	D3	D2	D1	D0	
30	Port 3/B	Port 3/A	Port 2/B	Port 2/A	Port 1/B	Port 1/A	Port 0/B	Port 0/A	0 - Disable 1 - Enable
31	Port 7/B	Port 7/A	Port 6/B	Port 6/A	Port 5/B	Port 5/A	Port 4/B	Port 4/A	
32	Port 11/B	Port 11/A	Port 10/B	Port 10/A	Port 9/B	Port 9/A	Port 8/B	Port 8/A	
33	RESERVED								

This parameter enables or disables the cycle count limit notification functionality of the digital inputs. If this parameter is enabled, then the PCH device will set the “Target Count” input status bit and “ICL Cycle Count Limit Reached” acyclic status bit when the cycle count limit is reached. The cycle count limit is configured through the webserver or the Configuration Tool.
Enable (1): Warning mode enabled
Disable (0): Warning mode disabled

Table 29 — Byte DIO Counter Type Information

Actual Byte Number	DIO Counter Type (0) Up or (1) Down								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
	D7	D6	D5	D4	D3	D2	D1	D0	
34	Port 3/B	Port 3/A	Port 2/B	Port 2/A	Port 1/B	Port 1/A	Port 0/B	Port 0/A	0 - Up 1 - Down
35	Port 7/B	Port 7/A	Port 6/B	Port 6/A	Port 5/B	Port 5/A	Port 4/B	Port 4/A	
36	Port 11/B	Port 11/A	Port 10/B	Port 10/A	Port 9/B	Port 9/A	Port 8/B	Port 8/A	
37	RESERVED								

This parameter defines the behavior of cycle count parameter of the digital IO as an up counter or down counter. This parameter has following two values:
Up counter (0): The cycle count associated with digital IO will increment by one for every cycle of digital IO. The cycle count will continue to increment beyond the configured cycle limit value (up to max limit of 20,000,000) in case cycle count type is configured as up counter. The cycle count will stop incrementing after it reaches the max limit of 20,000,000.
Down counter (1): The cycle count associated with digital IO will decrement by one for every cycle of digital IO. The cycle count will not decrement beyond zero after the respective IO is operated more than the configured maximum cycles in case the cycle type is configured as down counter.
The transition of digital IO from OFF to ON to OFF will be counted as one cycle.

Table 30 — DI Inversion Information

Actual Byte Number	DI Inversion (0) No Invert or (1) Invert								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
	D7	D6	D5	D4	D3	D2	D1	D0	
38	Port 3/B	Port 3/A	Port 2/B	Port 2/A	Port 1/B	Port 1/A	Port 0/B	Port 0/A	0 - No Invert 1 - Invert
39	Port 7/B	Port 7/A	Port 6/B	Port 6/A	Port 5/B	Port 5/A	Port 4/B	Port 4/A	
40	Port 11/B	Port 11/A	Port 10/B	Port 10/A	Port 9/B	Port 9/A	Port 8/B	Port 8/A	
41	RESERVED								
This parameter enables or disables the inversion on digital input. If this parameter is enabled, then inverted state of respective input is communicated to PLC and configuration utility. The invert functionality is not applicable to LED indication on the PCH Portal.									

Table 31 — De-bounce Time Information

Actual Byte Number	De-bounce time 0 – 120 msec in Decimal
42	DBT Port 0/A
43	DBT Port 0/B
44	DBT Port 1/A
45	DBT Port 1/B
46	DBT Port 2/A
47	DBT Port 2/B
48	DBT Port 3/A
49	DBT Port 3/B
50	DBT Port 4/A
51	DBT Port 4/B
52	DBT Port 5/A
53	DBT Port 5/B
54	DBT Port 6/A
55	DBT Port 6/B
56	DBT Port 7/A
57	DBT Port 7/B
58	DBT Port 8/A
59	DBT Port 8/B
60	DBT Port 9/A
61	DBT Port 9/B
62	DBT Port 10/A
63	DBT Port 10/B
64	DBT Port 11/A
65	DBT Port 11/B
This parameter defines the debounce time to ignore jitter in the input signal. This parameter applies for both ON to OFF and OFF to ON transition. If the debounce time configured is 0, then it disables the debounce logic. The valid range of this parameter is 0 to 120 milliseconds.	

Table 32 — Valve Fault Mode Information

Actual Byte Number	Valve Fault Mode								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
	D7	D6	D5	D4	D3	D2	D1	D0	
66	FM07	FM06	FM05	FM04	FM03	FM02	FM01	FM00	0 - Off 1 - Last Good
67	FM15	FM14	FM13	FM12	FM11	FM10	FM09	FM08	
68	FM23	FM22	FM21	FM20	FM19	FM18	FM17	FM16	
69	FM31	FM30	FM29	FM28	FM27	FM26	FM25	FM24	

The Fault Value setting describes the behavior of the valve outputs in case there is a communication break between PLC and the PCH Portal or when a Backplane communication fault occurs. This has following two values:

Last Good (1): The valve will be set to last good value after the communication error is detected.
Off (0): The valve will be set to OFF state after the communication error is detected.

Table 33 — Valve Counter Control Information

Actual Byte Number	Valve Counter Control								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
	D7	D6	D5	D4	D3	D2	D1	D0	
70	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	0 - Disable 1 - Enable
71	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08	
72	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16	
73	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24	

This parameter enables or disables the cycle count limit notification functionality of valve output. If this parameter is enabled, then the PCH device will set the “Target Count” input status bit along with the “Valve” input status bit, along with the “VCL Cycle Count Limit Reached” acyclic status bit when the cycle count limit is reached. The cycle count limit is configured through the webserver or the Configuration Tool.This has following two values:

Enable (1): Warning mode enabled.
Disable (0): Warning mode disabled.

Table 34 — Valve Counter Type Information

Actual Byte Number	Valve Counter Type								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
	D7	D6	D5	D4	D3	D2	D1	D0	
74	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	0 - Up 1 - Down
75	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08	
76	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16	
77	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24	

This parameter defines the behavior of cycle count parameter of the valve output as an up counter or down counter. This parameter has the following two values:

Up counter (0): The cycle associated with valve will increment by one for every cycle of valve output. The cycle count will continue to increment beyond the configured cycle limit valve (up to max limit of 20,000,000) in case cycle count type is configured as up counter. The cycle count will stop incrementing after it reaches the max limit of 20,000,000.
Down counter (1): The cycle count associated with valve will decrement by one for every cycle of valve output. The cycle count will not decrement beyond zero after the respective valve is operated for more than the configured maximum cycles in case the cycle count type is configured as down counter.

The transition of valve output from OFF to ON to OFF will be counted as one cycle.

Table 35 — IO-Link Port Configuration

IO-Link Port 0 Configuration									
Actual Byte Number	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description
	D7	D6	D5	D4	D3	D2	D1	D0	
78	Data Storage (Parameter Server)								Data Storage
79									

This parameter defines the behaviour of “Data Storage (Parameter Server)" of the IO-Link. This parameter has the following five values:

Disable	0x0040
Upload	0x0081
Download	0x0082
Upload + Download	0x0083
Clear	0x0020

NOTE: The above Data Storage Configuration are also applicable for IO-Link Port #1 to IO-Link Port #11

80	Validation Type	Validation Type
81		

This parameter defines the behaviour of “Validation Type (Inspection Level)" of the IO-Link. This parameter has the following three values:

No Validation	0x0000
Compatible	0x0001
Identical	0x0002

NOTE: The above Validation Type Configuration are also applicable for IO-Link Port #1 to IO-Link Port #11

82	Vendor ID 1	Vendor ID 1
83	Vendor ID 2	Vendor ID 2

IO-Link Port 0 Configuration									
Actual Byte Number	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**	**Description**
	D7	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	
84	Device ID 1								Device ID 1
85	Device ID 2								Device ID 2
86	Device ID 3								Device ID 3
87	Base				Time				Cycle Time

The Cycle Time parameter, byte 87, can be used to influence the IO-Link communication speed. Using the multiplier and the time base, IO-Link cycle time can be set.

Bit								Description
7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	
Time base		Multiplier						Bit 0 to 5: Multiplier These bits contain a 6-bit multiplier for the calculation of Master Cycle Time or Min Cycle Time. Permissible values for the multiplier are 0 to 63. Bit 6 to 7: Time Base These bits specify the time base for the calculation of Maximum Cycle time and Minimum Cycle time.

Possible values of Maximum Cycle time and Minimum Cycle time

Time base encoding	Time base value	Calculation	Cycle time
00	0.1 ms	Multiplier x time base	0.4 ms to 6.3 ms
01	0.4 ms	6.4 ms + multiplier x time base	6.4 ms to 31.6 ms
10	1.6 ms	32.0 ms + multiplier x time base	32.0 ms to 132.8 ms
11	Reserved	Reserved	Reserved
NOTE: The value 0.4 results from the minimum possible transmission time.			

Table 36 — IO-Link Port Configuration Information

IO-Link Port 0 Configuration									
Actual Byte Number	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**	**Description**
	D7	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	
88-103	Serial Number - Byte No. 01 – 16								Serial Number
104 to 129	IO-Link Port 1 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 1
130 to 155	IO Link Port 2 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 2
156 to 181	IO Link Port 3 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 3
182 to 207	IO Link Port 4 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 4
208 to 233	IO Link Port 5 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 5
234 to 259	IO Link Port 6 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 6
260 to 285	IO Link Port 7 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 7
286 to 311	IO Link Port 8 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 8
312 to 337	IO Link Port 9 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 9
338 to 363	IO Link Port 10 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 10
364 to 389	IO Link Port 11 Configuration (Refer to Port 0 Configuration for definition)								Data for IO-Link Port 11

4.2.3 Process Data Inputs Connection 1 and Connection 2

The following information describes the process data input map for EtherNet/IP Connection 1 and Connection 2 options. This map is fixed.

NOTE: for an explanation of the behaviour of the diagnostic bits contained in Bytes 0 and 1, please refer to Table 50: Process Input Status Bits.

Table 37 — Process Data Input Information

Area/ Module	Byte No.	Size (Bytes)	Bits								Description
			7	6	5	4	3	2	1	0	
Device Control Status	0	1	External Module	RESV	Valve	I/O/ IO-LINK	Network	Logic Voltage	Auxiliary Voltage	MS/ CoProc	Status Byte 1 1- Bad 0 - Good
	1	1	Target Count	External Sensor Power Fault	Temperature Warning	Auxiliary Current	Logic Current	Trending Data	Warning	Error	Status Byte 2 1- Bad 0 - Good
	2	1	RESERVED			OC3	OC2	OC1	OC	FRS	FRS - Fuse Status 0 - Fuse Not Blown 1 - Fuse Blown (Short circuit on logic supply) OC - Module 1/2/3 Over Current (latched bit) OC1 - Module 1 Over Current OC2 - Module 2 Over Current OC3 - Module 3 Over Current 0 - No Over Current 1 - Over Current
	3	1	SS07	SS06	SS05	SS04	SS03	SS02	SS01	SS00	SS - Safety Status
	4	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	VF - Valve Fault Status 0 - No Fault 1 - Short to Ground
	5	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08	
	6	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16	
	7	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24	
	8-11	1	RESERVED								
Standard Inputs	12	1	B3	A3	B2	A2	B1	A1	B0	A0	Input Channel Data(I) 0 - OFF 1 - ON Ixy -> Input on pin x, port y if a port is configured as an IO-Link port, result is 0
	13	1	B7	A7	B6	A6	B5	A5	B4	A4	
	14	1	B11	A11	B10	A10	B9	A9	B8	A8	
	15	1	RESERVED								
IO-Link Inputs	16	32	Input Process Data for IO-Link Port 00								IO-Link Process Data
	48	32	Input Process Data for IO-Link Port 01								IO-Link Process Data
	80	32	Input Process Data for IO-Link Port 02								IO-Link Process Data
	112	32	Input Process Data for IO-Link Port 03								IO-Link Process Data
	144	32	Input Process Data for IO-Link Port 04								IO-Link Process Data
	176	32	Input Process Data for IO-Link Port 05								IO-Link Process Data
	208	32	Input Process Data for IO-Link Port 06								IO-Link Process Data

Area/ Module	Byte No.	Size (Bytes)	Bits								Description
			7	6	5	4	3	2	1	0	
	240	32	Input Process Data for IO-Link Port 07								IO-Link Process Data
	272	32	Input Process Data for IO-Link Port 08								IO-Link Process Data
	304	32	Input Process Data for IO-Link Port 09								IO-Link Process Data
	336	32	Input Process Data for IO-Link Port 10								IO-Link Process Data
	368	32	Input Process Data for IO-Link Port 11								IO-Link Process Data
IO-Link Status Module	400	1	RESV	EV	SC	PDI	DF	VF	DC	IOL	IO-Link Port 0 Device Status 0 - Port is not IO-Link 1 - IO-link Port enabled DC - Device Connect Status 0 - Not Connected/Disconnected 1 - Device Connected VF - Validation Status 0 - Validation ok 1 - Validation Fail DF - Data Storage Validation 0 - Validation OK 1 - Data Storage Validation Fail PDI - Process Data status 0 - Process Data Valid 1 - Process Data Invalid SC - IOL Short Circuit Status 0 - no IOL Short Circuit 1 - IOL Short Circuit occurred EV - Event Status 0 - No event present 1 - Event Present in IO-Link
	401	1	IO-Link Port 0 Vendor ID 1								Vendor ID
	402	1	IO-Link Port 0 Vendor ID 2								
	403	1	IO-Link Port 0 Device ID 1								Device ID
	404	1	IO-Link Port 0 Device ID 2								
	405	1	IO-Link Port 0 Device ID 3								
	406	6	Port 01 IO-Link Device Status								Reference Port 00 for definition
	412	6	Port 02 IO-Link Device Status								Reference Port 00 for definition
	418	6	Port 03 IO-Link Device Status								Reference Port 00 for definition
	424	6	Port 04 IO-Link Device Status								Reference Port 00 for definition
	430	6	Port 05 IO-Link Device Status								Reference Port 00 for definition
	436	6	Port 06 IO-Link Device Status								Reference Port 00 for definition

Area/ Module	Byte No.	Size (Bytes)	Bits								Description
			7	6	5	4	3	2	1	0	
	442	6	Port 07 IO-Link Device Status								Reference Port 00 for definition
	448	6	Port 08 IO-Link Device Status								Reference Port 00 for definition
	454	6	Port 09 IO-Link Device Status								Reference Port 00 for definition
	460	6	Port 10 IO-Link Device Status								Reference Port 00 for definition
	466	6	Port 11 IO-Link Device Status								Reference Port 00 for definition
External Modules	472	28	External Module Data								Reserved for external module data for future

4.2.4 Process Data Outputs Connection 1 and Connection 2

The following information describes the process data output map for EtherNet/IP Connection 1 and Connection 2 option. This map is fixed.

Table 38 — Process Data Output Information

Area/ Module	Byte No.	Size (Bytes)	Bits								Description
			7	6	5	4	3	2	1	0	
Standard Outputs	0	1	B3	A3	B2	A2	B1	A1	B0	A0	Output Channel Data(O) 0 - OFF 1 - ON Oxy -> Output on Pin x, Port y if a port is configured as an IO-Link port, result is 0
	1	1	B7	A7	B6	A6	B5	A5	B4	A4	
	2	1	B11	A11	B10	A10	B9	A9	B8	A8	
Device Control	3	1	RESERVED							RST	RST: 0 to 1 transition will reset OC bit
Valve Outputs	4	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	Valve Output Data Vxx -> Output on Valve xx xx range is 0 to 31
	5	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08	
	6	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16	
	7	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24	
IO-Link Outputs	8	32	Output Process Data for IO-Link Port 00								IO-Link Process Data
	40	32	Output Process Data for IO-Link Port 01								IO-Link Process Data
	72	32	Output Process Data for IO-Link Port 02								IO-Link Process Data
	104	32	Output Process Data for IO-Link Port 03								IO-Link Process Data
	136	32	Output Process Data for IO-Link Port 04								IO-Link Process Data
	168	32	Output Process Data for IO-Link Port 05								IO-Link Process Data
	200	32	Output Process Data for IO-Link Port 06								IO-Link Process Data
	232	32	Output Process Data for IO-Link Port 07								IO-Link Process Data
	264	32	Output Process Data for IO-Link Port 08								IO-Link Process Data
	296	32	Output Process Data for IO-Link Port 09								IO-Link Process Data
	328	32	Output Process Data for IO-Link Port 10								IO-Link Process Data
	360	32	Output Process Data for IO-Link Port 11								IO-Link Process Data
External Module	392	100	External Module Data								Reserved for external modules for future

4.2.5 Process Data Inputs Connection 3

The following information describes the process data input map for EtherNet/IP Connection 3 option. This map is flexible for IO-Link inputs and status data section. The IO-Link input and status data are updated whenever new IO-Link configuration is received. The first 4 configured IO-Link ports (from port number 0 to 11) will be displayed in this map. The rest of the IO-Link ports data won't be displayed.

NOTE: for an explanation of the behaviour of the diagnostic bits contained in Bytes 0 and 1, please refer to Table 50: Process Input Status Bits.

Table 39 — Process Data Input Information

Area/ Module	Byte No.	Size (Bytes)	Bits								Description	Fixed/ Flexible
			7	6	5	4	3	2	1	0		
Device Control Status	0	1	External Module	RESV	Valve	I/O/ IO-LINK	Network	Logic Voltage	Auxiliary Voltage	MS/ CoProc	Status Byte 1 1- Bad 0 - Good	Fixed
	1	1	Target Count	External Sensor Power Fault	Temperature Warning	Auxiliary Current	Logic Current	Trending Data	Warning	Error	Status Byte 2 1- Bad 0 - Good	
	2	1	RESERVED			OC3	OC2	OC1	OC	FRS	FRS - Fuse Status 0 - Fuse Not Blown 1 - Fuse Blown(Short circuit on logic supply) OC - Module 1/2/3 Over Current (latched bit)OC1 - Module 1 Over Current OC2 - Module 2 Over Current OC3 - Module 3 Over Current 0 - No Over Current 1 - Over Current	
	3	1	SS07	SS06	SS05	SS04	SS03	SS02	SS01	SS00	SS - Safety Status	
	4	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	VF - Valve Fault Status 0 - No Fault 1 - Short to Ground	
	5	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08		
	6	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16		
	7	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24		
	8-11	1	RESERVED								Reserved	
Standard Inputs	12	1	B3	A3	B2	A2	B1	A1	B0	A0	Input Channel Data(I) 0 - OFF 1 - ON Ixy -> Input on Pin x, Port y if a port is configured as an IO-Link port, result is 0	Fixed
	13	1	B7	A7	B6	A6	B5	A5	B4	A4		
	14	1	B11	A11	B10	A10	B9	A9	B8	A8		
	15	1	RESERVED									
IO-Link Inputs	16	32	Input Process Data for 1st Configured IO-Link Port								IO-Link Process Data	Flexible
	48	32	Input Process Data for 2nd Configured IO-Link Port								IO-Link Process Data	Flexible
	80	32	Input Process Data for 3rd Configured IO-Link Port								IO-Link Process Data	Flexible
	112	32	Input Process Data for 4th Configured IO-Link Port								IO-Link Process Data	Flexible
IO-Link Status Module	144	1	RESV	EV	SC	PDI	DF	VF	DC	IOL	IO-Link Device Status IOL - IO-Link Status 0 - Port is not IO-Link 1 - IO-link Port enabled	Flexible

Area/ Module	Byte No.	Size (Bytes)	Bits								Description	Fixed/ Flexible
			7	6	5	4	3	2	1	0		
											DC - Device Connect Status 0 - Not Connected/Disconnected 1 - Device Connected VF - Validation Status 0 - Validation ok 1 - Validation Fail DF - Data Storage Validation 0 - Validation OK 1 - Data Storage Validation Fail PDI - Process Data status 0 - Process Data Valid 1 - Process Data Invalid SC - IOL Short Circuit Status 0 - no IOL Short Circuit 1 - IOL Short Circuit occurred EV - Event Status 0 - No event present 1 - Event Present in IO-Link	
	145	1	Vendor ID 1 for 1st Configured IO-Link Port								Vendor ID	
	146	1	Vendor ID 2 for 1st Configured IO-Link Port									
	147	1	Device ID 1 for 1st Configured IO-Link Port								Device ID	
	148	1	Device ID 2 for 1st Configured IO-Link Port									
	149	1	Device ID 3 for 1st Configured IO-Link Port									
	150	6	Status Data for 2nd Configured IO-Link Port								Reference Byte 144 for definition	Flexible
	156	6	Status Data for 3rd Configured IO-Link Port								Reference Byte 144 for definition	Flexible
	162	6	Status Data for 4th Configured IO-Link Port								Reference Byte 144 for definition	Flexible

4.2.6 Process Data Outputs Connection 3

The following information describes the process data output map for EtherNet/IP Connection 3 option. This map is flexible for IO-Link output data section. The IO-Link output data is updated whenever new IO-Link configuration is received. The first 4 configured IO-Link ports (from port number 0 to 11) are displayed in this map. The Remaining IO-Link ports won't be displayed. If all 12 ports are configured as an IO-Link via PLC at start-up the first 4 IO-link ports from Port 0 to Port 3 will be added in order.

Table 40 — Process Data Output Information

Area/ Module	Byte No.	Size (Bytes)	Bits								Description	Fixed/ Flexible
			7	6	5	4	3	2	1	0		
Standard Outputs	0	1	B3	A3	B2	A2	B1	A1	B0	A0	Output Channel Data(O) 0 - OFF 1 - ON Oxy -> Output on port x, pin y if a port is configured as an IO-Link port, result is 0	Fixed
	1	1	B7	A7	B6	A6	B5	A5	B4	A4		
	2	1	B11	A11	B10	A10	B9	A9	B8	A8		
Device Control	3	1	RESERVED							RST	RST: 0 to 1 transition will reset OC bit	Fixed
Valve Outputs	4	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	Valve Output Data Vxx -> Output on Valve xx xx range is 0 to 31	Fixed
	5	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08		
	6	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16		
	7	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24		
IO-Link Outputs	8	32	Output Process Data for 1st Configured IO-Link Port								IO-Link Process Data	Flexible
	40	32	Output Process Data for 2nd Configured IO-Link Port								IO-Link Process Data	Flexible
	72	32	Output Process Data for 3rd Configured IO-Link Port								IO-Link Process Data	Flexible
	104	32	Output Process Data for 4th Configured IO-Link Port								IO-Link Process Data	Flexible

4.2.7 Specialized Quick Connect Configuration Data

The following configuration data describes Ethernet/IP's Connection 4 option. In this, the configuration size has been reduced from 390 bytes to 38 bytes to achieve 250 msec connection time. This configuration data does not support IO-Link configuration.

Table 41 — Connection Type 4 Port Configuration Information

Configuration Parameter	Byte No.	Size (Bytes)	Bits 7 (D7)	6 (D6)	5 (D5)	4 (D4)	3 (D3)	2 (D2)	1 (D1)	0 (D0)	Description
Parameterization	0	1	Module Parameterization								0 - Disable 1 – Enable When Module Parameterization is enabled, the configuration data provided in configuration assembly will be used. If disabled, PCH device will reject the configuration assembly data
	1	1	RESV								
Port / Pin Configuration	2	1	B1		A1		B0		A0		Each IO module slot contains configuration of 8 pins which are defined as Ax and Bx. 2 bits in each IO module slots are allotted for each IO module pins. See definition of Ax and Bx Ax and Bx (x=0,1,2,3…11) Definition of A and B pins: Input PNP =0x00 Input NPN =0x04 Output = 0x01 IO-Link = 0x02 None = 0x03
	3	1	B3		A3		B2		A2		
	4	1	B5		A5		B4		A4		
	5	1	B7		A7		B6		A6		
	6	1	B9		A9		B8		A8		
	7	1	B11		A11		B10		A10		
DO Fault Mode	8	1	B3	A3	B2	A2	B1	A1	B0	A0	0 - Fault Value 1 - Last Good
	9	1	B7	A7	B6	A6	B5	A5	B4	A4	
	10	1	B11	A11	B10	A10	B9	A9	B8	A8	
DIO Counter Control (Warning Mode)	11	1	B3	A3	B2	A2	B1	A1	B0	A0	0 - Disable 1 - Enable
	12	1	B7	A7	B6	A6	B5	A5	B4	A4	
	13	1	B11	A11	B10	A10	B9	A9	B8	A8	
DIO Counter Type	14	1	B3	A3	B2	A2	B1	A1	B0	A0	0 - Up 1 - Down
	15	1	B7	A7	B6	A6	B5	A5	B4	A4	
	16	1	B11	A11	B10	A10	B9	A9	B8	A8	
DI Inversion	17	1	B3	A3	B2	A2	B1	A1	B0	A0	0 - No Invert 1 - Invert
	18	1	B7	A7	B6	A6	B5	A5	B4	A4	
	19	1	B11	A11	B10	A10	B9	A9	B8	A8	
De-bounce Time	20	1	B1		A1		B0		A0		2 bits are allotted for de-bounce time of configured Digital Input port. Below defined de-bounce time values are only supported in Connection Type 4 Configuration 00 - 0msec
	21	1	B3		A3		B2		A2		
	22	1	B5		A5		B4		A4		
	23	1	B7		A7		B6		A6		
	24	1	B9		A9		B8		A8		

Configuration Parameter	Byte No.	Size (Bytes)	Bits								Description
			7	6	5	4	3	2	1	0	
			D7	D6	D5	D4	D3	D2	D1	D0	
	25	1	B11		A11		B10		A10		01 - 20msec 02 - 80msec 03 - 120msec
Valve Fault Mode	26	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	0 - Off 1 - Last Good
	27	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08	
	28	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16	
	29	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24	
Valve Counter Control	30	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	0 - Disable 1 - Enable
	31	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08	
	32	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16	
	33	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24	
Valve Counter Type	34	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	0 - Up 1 - Down
	35	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08	
	36	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16	
	37	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24	

4.2.8 Specialized Quick Connect Process Input

The following information describes the process data input map for EtherNet/IP's Connection 4 option. In this, IO-Link input and status data is not displayed because Connection 4 does not support IO-Link.

NOTE: for an explanation of the behaviour of the diagnostic bits contained in Bytes 0 and 1, please refer to Table 50: Process Input Status Bits.

Table 42 — Connection Type 4 Process Data Input Information

Area/ Module	Byte No.	Size (Bytes)	Bits								Description	Fixed/ Flexible
			7	6	5	4	3	2	1	0		
Device Control Status	0	1	External Module	RESV	Valve	I/O	Network	Logic Voltage	Auxiliary Voltage	MS/ CoProc	Status Byte 1 1- Bad 0 - Good	Fixed
	1	1	Target Count	External Sensor Power Fault	Temperature Warning	Auxiliary Current	Logic Current	Trending Data	Warning	Error	Status Byte 2 1- Bad 0 - Good	
	2	1	RESERVED			OC3	OC2	OC1	OC	FRS	FRS -Fuse Status 0 - Fuse Not Blown 1 - Fuse Blown(Short circuit on logic supply) OC - Module 1/2/3 Over Current (latched bit) OC1 - Module 1 Over Current OC2 - Module 2	

Area/ Module	Byte No.	Size (Bytes)	Bits 7	6	5	4	3	2	1	0	Description	Fixed/ Flexible
											Over Current OC3 - Module 3 Over Current 0 - No Over Current 1 - Over Current	
	3	1	SS07	SS06	SS05	SS04	SS03	SS02	SS01	SS00	SS - Safety Status	
	4	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	VF - Valve Fault Status 0 - No Fault 1 - Short to Ground	
	5	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08		
	6	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16		
	7	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24		
	8-11	1	RESERVED								Reserved	
Standard Inputs	12	1	B3	A3	B2	A2	B1	A1	B0	A0	Input Channel Data(I) 0 - OFF 1 - ON Ixy -> Input on pin x, port y if a port is configured as an IO-Link port, result is 0	Fixed
	13	1	B7	A7	B6	A6	B5	A5	B4	A4		
	14	1	B11	A11	B10	A10	B9	A9	B8	A8		
	15	1	RESERVED									

4.2.9 Specialized Quick Connect Process Output

The following information describes the process data output map for EtherNet/IP's Connection 4 option. In this, IO-Link output data is not displayed because Connection 4 does not support IO-Link.

Table 43 — Connection Type 4 Process Data Output Information

Area/ Module	Byte No.	Size (Bytes)	Bits 7	6	5	4	3	2	1	0	Description	Fixed/ Flexible
Standard Outputs	0	1	B3	A3	B2	A2	B1	A1	B0	A0	Output Channel Data(O) 0 - OFF 1 - ON Oxy -> Output on pin x, port y if a port is configured as an IO-Link port, result is 0	Fixed
	1	1	B7	A7	B6	A6	B5	A5	B4	A4		
	2	1	B11	A11	B10	A10	B9	A9	B8	A8		
Device Control	3	1	RESERVED							RST	Reset: 0 to 1 transition will reset OC bit	Fixed
Valve Outputs	4	1	VA07	VA06	VA05	VA04	VA03	VA02	VA01	VA00	Valve Output Data Vxx -> Output on Valve xx xx range is 0 to 31	Fixed
	5	1	VA15	VA14	VA13	VA12	VA11	VA10	VA09	VA08		
	6	1	VA23	VA22	VA21	VA20	VA19	VA18	VA17	VA16		
	7	1	VA31	VA30	VA29	VA28	VA27	VA26	VA25	VA24	---	

4.3 Diagnostic Data

The PCH Portal provides for acyclic communication method to access errors, warnings and IO-Link parameters. The following table provides class, instance and attribute details required to read/write diagnostic data or parameter data from PCH Portal.

Table 44 — Diagnostic Data

Byte No.	Area/ Module	Bits								Access Type	Description	Ethernet/ IP Class (HEX): 0xA2 Attribute (HEX): 0x05
		B7	B6	B5	B4	B3	B2	B1	B0			Instance (DEC)
0	Auxiliary Voltage	RESERVED				**Auxiliary Voltage Warning Level**	**Auxiliary Voltage Fault Level**			**RO**	Auxiliary Voltage Fault and Warning Levels 0x00 - No Fault & Warning 0x01 - Low 0x10 - High 0x11 - No Supply or High/Low Voltage cutoff	118
1		RESERVED										
2		**AUX Voltage (millivolts) Byte 3 – low byte, Byte 2 – high byte**								**RO**	Device AUX Voltage	152
3												
4	Logic Voltage	RESV				**Logic Voltage Warning Level**	**Logic Voltage Fault Level**			**RO**	Logic Voltage Fault and Warning Levels 0x00 - No Fault & Warning 0x01 - Low 0x10 - High 0x11 - Reserved	119
5		RESERVED										
6		**Logic Voltage (millivolts) Byte 7 – low byte, Byte 6 – high byte**								**RO**	Device Logic Voltage	151
7												
8	MS/ Co-Proc	RESERVED										
9		RESERVED					**Database Initialization Failed**	**Backplane Initialization Failed**		**RO**	Device Start-up Fail 0 - No Failure 1 - Failure	121
10		RESERVED										
11		RESERVED					**Backplane Break <Warning>**	**Backplane Break <Fault>**		**RO**	Backplane Break Fault/ Warning 0 - No Break 1 - Break	123
12		RESERVED				**Watch Dog Expired Warning / Fault**	**Watch Dog Expired Module**			**RO**	Watch Dog Expired - Module 0x00 - No Error 0x01 - Co-Proc 0x10 - Valve 0x11 - IO Module Watch Dog Expired - Warning / Fault 0x00 - No Warning/ Fault 0x01 - Warning 0x10 - Fault 0x11 - Reserved	124

Byte No.	Area/ Module	Bits								Access Type	Description	Ethernet/ IP Class (HEX): 0xA2 Attribute (HEX): 0x05
		B7	B6	B5	B4	B3	B2	B1	B0			Instance (DEC)
13		Module Position - Watch Dog Expired								RO	Module Position. Watch Dog Expired 0 - No Watch Dog Expired 1 - 255 – Module Position.	125
14-17		RESERVED										
18	Valve	VCL 07	VCL 06	VCL 05	VCL 04	VCL 03	VCL 02	VCL 01	VCL 00	RO	Valve Cycle Count Limit Reached 0 - No Cycle Count Limit Reached 1 - Cycle Count Limit Reached Note: On Cycle Count Limit Reached, the corresponding Valve bit is set for 2 secs and then reset to 0.	126
19		VCL 16	VCL 14	VCL 13	VCL 12	VCL 11	VCL 10	VCL 09	VCL 08			
20		VCL 23	VCL 22	VCL 21	VCL 20	VCL 19	VCL 18	VCL 17	VCL 16			
21		VCL 31	VCL 30	VCL 29	VCL 28	VCL 27	VCL 26	VCL 25	VCL 24			
22		VCL - RST 07	VCL - RST 06	VCL - RST 05	VCL - RST 04	VCL - RST 03	VCL - RST 02	VCL - RST 01	VCL - RST 00	WO	Valve Cycle Count Reset 0 - No Change 1 - Set to Reset the Cycle Count	127
23		VCL - RST 15	VCL - RST 14	VCL - RST 13	VCL - RST 12	VCL - RST 11	VCL - RST 10	VCL - RST 09	VCL - RST 08			
24		VCL - RST 23	VCL - RST 22	VCL - RST 21	VCL - RST 20	VCL - RST 19	VCL - RST 18	VCL - RST 17	VCL - RST 16			
25		VCL - RST 31	VCL - RST 30	VCL - RST 29	VCL - RST 28	VCL - RST 27	VCL - RST 26	VCL - RST 25	VCL - RST 24			
26-35		RESERVED										
36		RESERVED				Valve Driver - 4	Valve Driver - 3	Valve Driver - 2	Valve Driver - 1	RO	Valve Driver - SPI Communication Warning 0 - Valve Driver - SPI Communication OK 1 - Valve Driver - SPI Communication Warning	128
37-39		RESERVED										
40		RESRVED				Valve Driver - 4	Valve Driver - 3	Valve Driver - 2	Valve Driver - 1	RO	Valve Driver - SPI Communication Fault 0 - Valve Driver - SPI Communication OK 1 - Valve Driver - SPI Communication Fault	129
41		RESERVED					EEPROM Corrupt		EEPROM - I2C Communict	RO	EEPROM - I2C Communication Fault 0 - EEPROM - I2C Communication OK 1 - EEPROM -	130

Byte No.	Area/ Module	Bits								Access Type	Description	Ethernet/ IP Class (HEX): 0xA2 Attribute (HEX): 0x05
		B7	B6	B5	B4	B3	B2	B1	B0			Instance (DEC)
	Valve										I2C Communication Fault EEPROM - Corrupt 0 - EEPROM Not Corrupted 1 - EEPROM Corrupted	
42-43		RESERVED										
44	IO/ IO-Link	ICL 034	ICL 032	ICL 024	ICL 022	ICL 014	ICL 012	ICL 004	ICL 002	RO	Discrete Input Cycle Count Limit Reached 0 - No Cycle Count Limit Reached 1 - Cycle Count Limit Reached Note: On Cycle Count Limit Reached, the corresponding Input bit is set for 2 secs and then reset to 0.	131
45		ICL 074	ICL 072	ICL 064	ICL 062	ICL 054	ICL 052	ICL 044	ICL 042			
46		ICL 114	ICL 112	ICL 104	ICL 102	ICL 094	ICL 092	ICL 084	ICL 082			
47-48		RESERVED										
49		ICC - RST 034	ICC - RST 032	ICC - RST 024	ICC - RST 022	ICC - RST 014	ICC - RST 012	ICC - RST 004	ICC - RST 002	WO	Discrete Input Cycle Count Reset 0 - No Change 1 - Reset the Cycle Count	132
50		ICC - RST 074	ICC - RST 072	ICC - RST 064	ICC - RST 062	ICC - RST 054	ICC - RST 052	ICC - RST 044	ICC - RST 042			
51		ICC - RST 114	ICC - RST 112	ICC - RST 104	ICC - RST 102	ICC - RST 094	ICC - RST 092	ICC - RST 084	ICC - RST 082			
52-63		RESERVED										
64		OCL 034	OCL 032	OCL 024	OCL 022	OCL 014	OCL 012	OCL 004	OCL 002	RO	Discrete Output Count Limit Reached 0 - No Cycle Count Limit Reached 1 - Cycle Count Limit Reached Note: On Cycle Count Limit Reached, the corresponding DO bit is set for 2 secs and then reset to 0.	133
65		OCL 074	OCL 072	OCL 064	OCL 062	OCL 054	OCL 052	OCL 044	OCL 042			
66		OCL 114	OCL 112	OCL 104	OCL 102	OCL 094	OCL 092	OCL 084	OCL 082			
67-68		RESERVED										
69		OCC - RST 034	OCC - RST 032	OCC - RST 024	OCC - RST 022	OCC - RST 014	OCC - RST 012	OCC - RST 004	OCC - RST 002	WO	Discrete Output Count Reset 0 - No Change 1 -Reset the Cycle Count	134
70		OCC - RST 074	OCC - RST 072	OCC - RST 064	OCC - RST 062	OCC - RST 054	OCC - RST 052	OCC - RST 044	OCC - RST 042			
71		OCC - RST 114	OCC - RST 112	OCC - RST 104	OCC - RST 102	OCC - RST 094	OCC - RST 092	OCC - RST 084	OCC - RST 082			
72-84		RESERVED										

Byte No.	Area/ Module	Bits								Access Type	Description	Ethernet/ IP Class (HEX): 0xA2 Attribute (HEX): 0x05
		B7	B6	B5	B4	B3	B2	B1	B0			Instance (DEC)
85	IO/ IO-Link	ADC - I2C Communication Warning – Module Position								RO	ADC - I2C Communication Warning 0 - ADC - I2C Comm OK 1-3 – Module Position. 4 - 255 – Reserved	135
86		IO-Link Transceiver - USART 1 Communication Warning – Module Position								RO	IO-Link Transceiver - USART - 1 Communication Warning 0 - IO-Link Transceiver - USART Comm OK 1-3 -Module Position. 4 - 255 – Reserved	136
87		IO-Link Transceiver - USART 2 Communication Warning – Module Position								RO	IO-Link Transceiver - USART - 2 Communication Warning 0 - IO-Link Transceiver - USART Comm OK 1-3 – Module Position. 4 - 255 – Reserved	137
88		IO-Link Transceiver - USART 3 Communication Warning – Module Position								RO	IO-Link Transceiver - USART - 3 Communication Warning 0 - IO-Link Transceiver - USART Comm OK 1 - 3 – Module Position. 4 - 255 – Reserved	138
89		IO-Link Transceiver - USART 4 Communication Warning – Module Position								RO	IO-Link Transceiver - USART - 4 Communication Warning 0 - IO-Link Transceiver - USART Comm OK 1 - 3 – Module Position. 4 - 255 – Reserved	139
90-100		RESERVED										
101		External Flash Corrupt – Module Position								RO	EEPROM - SPI Communication Fault 0 - EEPROM - SPI Comm OK 1 - 3 – Module Position. 4 - 255 – Reserved	140

Byte No.	Area/ Module	Bits								Access Type	Description	Ethernet/ IP Class (HEX): 0xA2 Attribute (HEX): 0x05
		B7	B6	B5	B4	B3	B2	B1	B0			Instance (DEC)
102	IO/ IO-Link	ADC - I2C Communication Error – Module Position								RO	ADC - I2C Communication Fault 0 - ADC - I2C Comm OK 1 - 3 – Module Position. 4 - 255 – Reserved	141
103		IO-Link Transceiver - SPI Communication Error – Module Position								RO	IO-Link Transceiver - SPI Communication Fault 0 - IO-Link Transceiver- SPI Comm OK 1 – 3 – Module Position. 4 - 255 – Reserved	142
104		IO-Link Transceiver - USART 1 Communication Error – Module Position								RO	IO-Link Transceiver - USART - 1 Communication Fault 0 - IO-Link Transceiver - USART Comm OK 1 - 3 – Module Position. 4 - 255 – Reserved	143
105		IO-Link Transceiver - USART 2 Communication Error – Module Position								RO	IO-Link Transceiver - USART - 2 Communication Fault 0 - IO-Link Transceiver - USART Comm OK 1 - 3 – Module Position. 4 - 255 – Reserved	144
106		IO-Link Transceiver - USART 3 Communication Error – Module Position								RO	IO-Link Transceiver - USART - 3 Communication Fault 0 - IO-Link Transceiver - USART Comm OK 1 - 3 – Module Position. 4 - 255 – Reserved	145
107		IO-Link Transceiver - USART 4 Communication Error – Module Position								RO	IO-Link Transceiver - USART - 3 Communication Fault 0 - IO-Link Transceiver - USART Comm OK 1 - 3 – Module Position. 4 - 255 – Reserved	146

Byte No.	Area/ Module	Bits								Access Type	Description	Ethernet/ IP Class (HEX): 0xA2 Attribute (HEX): 0x05
		B7	B6	B5	B4	B3	B2	B1	B0			Instance (DEC)
108	IO/ IO-Link	External Module- Error – Module Position								RO	External Module - Fault 0 - No Error 1 - 3 – Module Position. 4 - 255 – Reserved Note: This is meant for non-classified error in external module	147
109		Fuse Status - Fault – Module Position								RO	Fuse Status - Fault 0 - No Fuse Fault 1 - 3 – Module Position. 4 - 255 – Reserved	148
110		Over Current - Fault – Module Position								RO	Over Current - Fault 0 - No Over Current Fault 1 - 3 – Module Position. 4 - 255 – Reserved	149
111		Over Current - Fault – Channel No								RO	Over Current - Fault 0 - 23 Channel No. Refer Table 16	150
112-145		RESERVED										
146	Network	RESERVED					PLC - Output Access		IP Address	RO	IP Address 0 - Valid IP Address 1- Invalid IP Address PLC - Output Access 0 - Access Enabled 1 - Access Disabled	156
147		RESERVED										
NA	IO-Link Events NOTE: IO-Link Event Data is only available since last power cycle or since the currently connected IO-Link device was connected.	Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 0 IO-Link Events	160
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 1 IO-Link Events	161
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 2 IO-Link Events	162
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 3 IO-Link Events	163
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 4 IO-Link Events	164
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 5 IO-Link Events	165
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 6 IO-Link Events	166
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 7 IO-Link Events	167
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 8 IO-Link Events	168
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 9 IO-Link Events	169
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 10 IO-Link Events	170
		Total 214 bytes (2 bytes of Total Events, 2 bytes of Event size, 210 bytes of event data)								RO	Port 11 IO-Link Events	171

Byte No.	Area/ Module	Bits								Access Type	Description	Ethernet/ IP Class (HEX): 0xA2 Attribute (HEX): 0x05
		B7	B6	B5	B4	B3	B2	B1	B0			Instance (DEC)
NA	IO-Link Index Subindex Acyclic Data Access Service	---	---	---	---	---	---	---	---	WO	Read Request (03) using Write Service DS - Data Size, RR - Read Request, PN - Port Number, IX - IOL Index, SX - IOL Subindex, DF - Data Field	109
		---	---	---	---	---	---	---	---			
		---	---	---	---	---	---	---	---	RO	Read Response (03) using Read Service DS - Data Size, DF - Data Field DF = (ES1 ES2 EC1 EC2) if ES1=0, ES2=0x80 DF = (ES1 ES2 Data) if ES1, ES2 = 0.	108
		---	---	---	---	---	---	---	---			
		---	---	---	---	---	---	---	---	WO	Write Request (02) using Write Service DS - Data Size, WR - Write Request, PN - Port Number, IX - IOL Index, SX - IOL Subindex, MS - Message Size, MG - Message	111
		---	---	---	---	---	---	---	---			
		---	---	---	---	---	---	---	---	RO	Write Response (02) using Read Service DS - Data Size, DR - Data Received, WR - Write Response DF = (ES1 ES2 EC1 EC2) if ES1=0, ES2=0x80 DF = (ES1 ES2 Data) if ES1, ES2 = 0.	110
		---	---	---	---	---	---	---	---			

Notes:

* Refer section 4.4: Configuration via Explicit Messages for Read response, Write Request and Write Response

4.4 Configuration via Explicit Messages

4.4.1 Write IO-Link Parameter

4.4.1.1 Write Request using Write Service

Table 45 — Set Attribute Single Query

Service Code (HEX)	Class (HEX)	Instance (DEC)	Attribute (DEC)
0x10	0xA2	111	5

Set required index, sub-index and data to be written to IO-Link sensor. Information to send in source element is given in below format, and the length of source element is equal to the total number of bytes given below:

Table 46 — Set Attribute Single Query Data

Port Number	IO-Link Parameter			Size	Data
Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5 - Byte 69
Port 0-11 (1 byte)	Index (high byte) (1 byte)	Index (low byte) (1 byte)	Sub-Index (1 byte)	N bytes (1 byte)	N bytes defined inSize (Max 65 bytes)

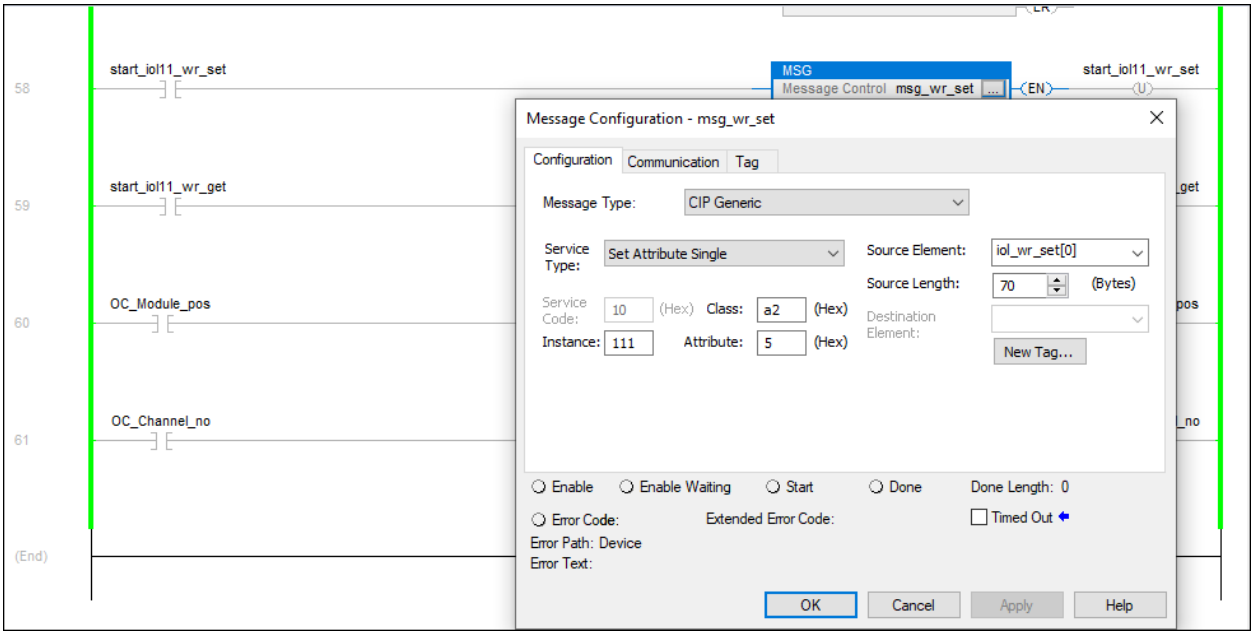


Figure 30 — Set Attribute Single Query

4.4.1.2 Write Response using Read Service

Table 47 — Get Attribute Single Query

Service Code (HEX)	Class (HEX)	Instance (DEC)	Attribute (DEC)
0x0E	0xA2	110	5

The response data is received in the destination element variable mentioned in the below figure. The response is either an ACK, NACK or BUSY which is indicated by 0x00 (ACK), 0x80 (NACK) or 0x01 (BUSY). On receiving NACK, the next 2 bytes are the error codes for the IO-Link device. This response data is available at the 1st byte of the Destination element tag.
If the response from PCH device is not ready, then after a timeout of 4 seconds, PCH device sends a response indicating BUSY which means PCH device is still processing and requires more time to respond. On this, the user/controller can send the Read request again until the ACK or NACK response is received. The response data is stored in the destination element as shown in the following figure:

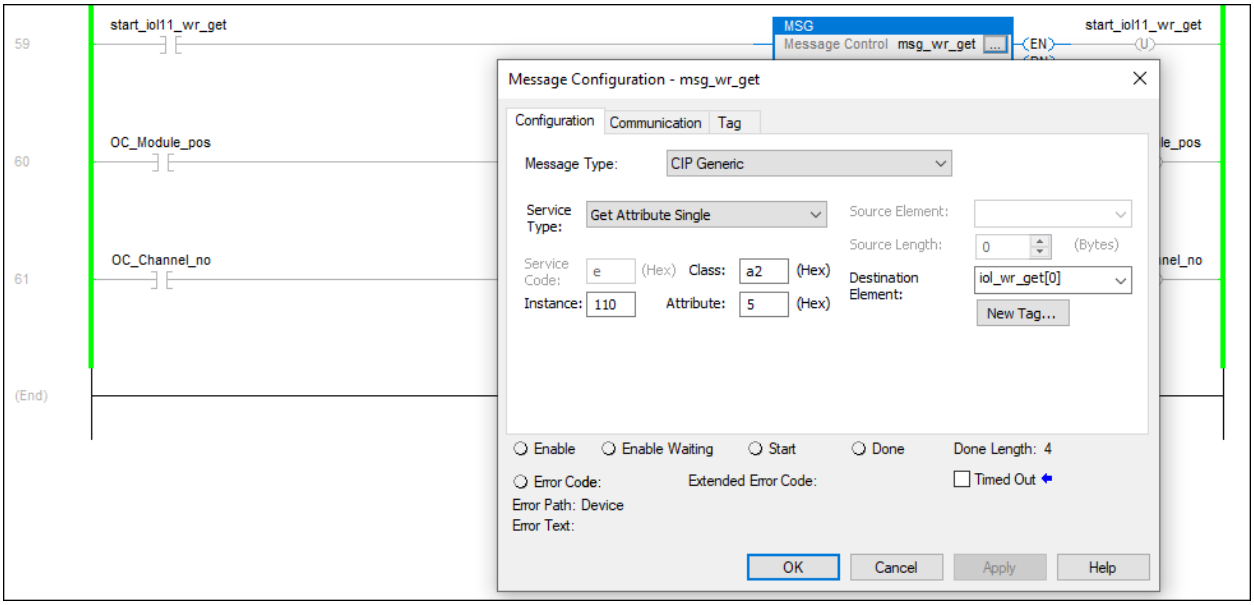


Figure 31 — Get Attribute Single Query

4.4.2 Read IO-Link Parameter

4.4.2.1 Read Request using Write service:

Table 48 — Set Attribute Single Query

Service Code (HEX)	Class (HEX)	Instance (DEC)	Attribute (DEC)
0x10	0xA2	109	5

Set required index, sub-index of IO-Link sensor. Information to send in source element is given in below format, and the length of source element is equal to the total number of bytes given below:

Table 49 — Set Attribute Single Query Data

Port Number	IO-Link Parameter		
Byte 0	**Byte 1**	**Byte 2**	**Byte 3**
Port 0-11 (1 byte)	Index (high byte) (1 byte)	Index (low byte) (1 byte)	Sub-Index (1 byte)

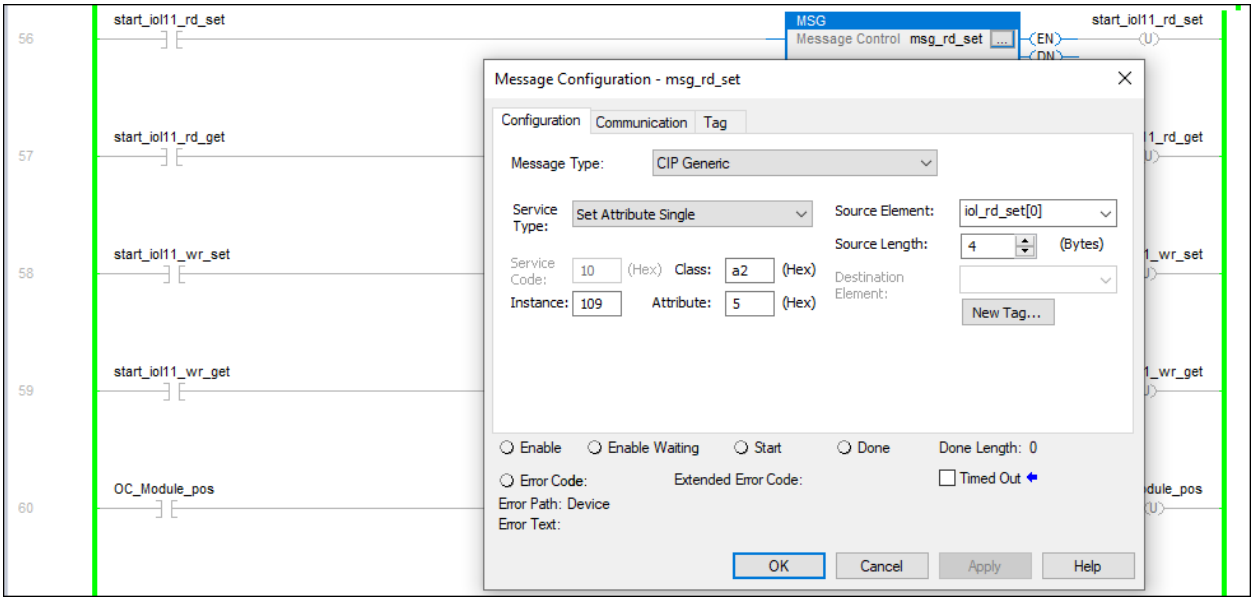


Figure 32 — Set Attribute Single Query

4.4.2.2 Read Response using Read Service

Table 50 — Get Attribute Single Query

Service Code (HEX)	Class (HEX)	Instance (DEC)	Attribute (DEC)
0x0E	0xA2	108	5

The response data is received in the destination element variable mentioned in the below figure. The response is either an ACK, NACK or BUSY which is indicated by 0x00 (ACK), 0x80 (NACK) or 0x01 (BUSY). On receiving NACK, the next 2 bytes are the error codes for the IO-Link device. This response data is available at the first byte of the Destination element tag

If the response from PCH device is not ready, then after a timeout of 4 seconds, PCH device sends a response indicating BUSY which means PCH device is still processing and requires more time to respond. On this, the user/controller can send the Read request again until the ACK or NACK response is received. The response data is stored in the destination element tag as shown in the following figure:

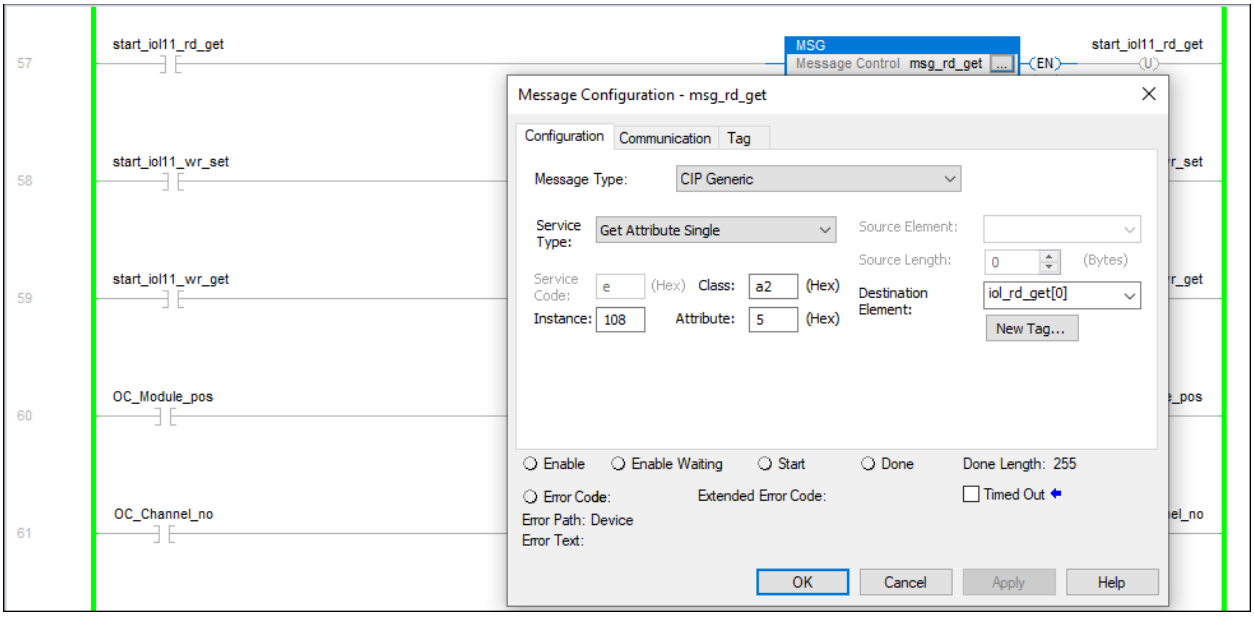


Figure 33 — Get Attribute Single Query

4.5 Quick Connect

The Quick Connect function allows PCH device to boot up faster. PCH device supports following 2 types of Quick Connect.

1. ODVA QuickConnect (boot up within 500 milliseconds)
2. FORD QuickConnect (boot up within 250 milliseconds)

When Quick Connect is enabled, below are the properties which are modified:

1. Static IP address
2. Ports configured at 100 Mbps full-duplex
3. Auto-negotiation disabled
4. Auto MDI-X disabled

You can select Quick Connect mode via the PC Configuration utility over USB or Bluetooth or by accessing the Embedded webpage. The Quick Connect option is available in the System Configuration tab. Select any of the Quick Connect options and save the configuration. Once the configuration is saved, Power cycle the PCH device to apply the new setting. Please refer Chapter 5: **The PC Configuration Tool/Web Interface** for more details on enabling Quick Connect.

PCH device will remain in Quick Connect state until it is disabled using the configuration utility or webpage or reset to default is performed.

CHAPTER - 5 Configuration Tool/Web Interface

The PCH Portal provides the following interfaces for configuration and monitoring of PCH Portal:

5.1 The PC Configuration Tool/Web Interface

The PC Configuration tool isPC/laptop based windows application that communicates over USB and Bluetooth Interface to the PCH Portal.

To connect the PC configuration tool via USB interface, connect the cable between the PC/Laptop and PCH Portal and launch PCH Portal Configuration Tool to get connected with the PCH Portal.

To connect PCH Portal web page via Ethernet interface connect the ethernet cable between the PC/Laptop and PCH Portal and enter the PCH Portal's IP address in the browser.

User can select prefered language from the language dropdown. Supported languages are English, Chinese, Korean, German, French, Japenese and Italian.

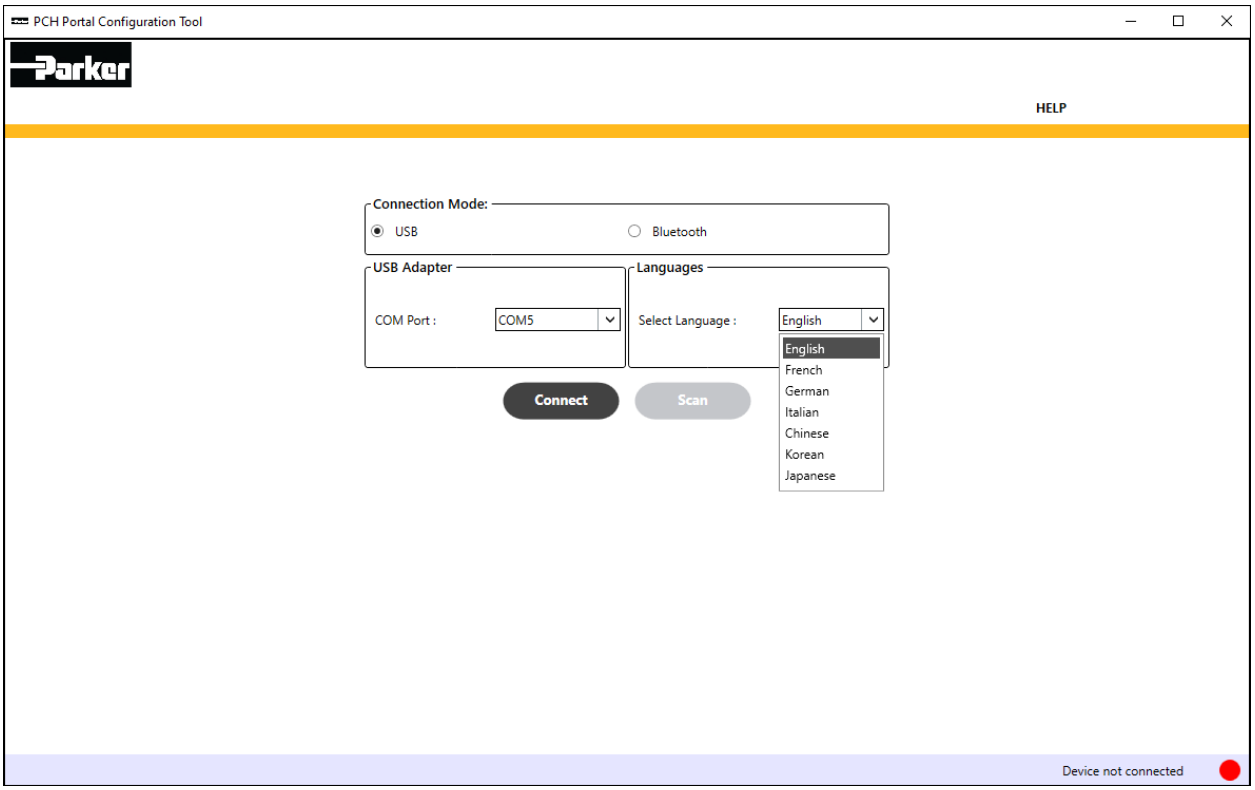


Figure 34 — PC Configuration Tool

To connect PC configuration tool via Bluetooth interface, a Bluetooth USB Dongle (BLED112) must be connected to USB port of PC or Laptop. Also, turn ON the Bluetooth on the PCH Portal by pressing the Bluetooth button for at least 3 seconds.

Select the 'Bluetooth' radio button on the screen. This will enable the 'Scan' button on the UI. To connect to the PCH Portal, click on the 'Scan' button. After scan is completed the available PCH Portal devices will be shown. The PCH Portal device can be identified using the device name displayed in the scan device list. The PCH Portal device name will be displayed as PCH-XXXX where XXXX is the last 4 digits of the MAC address printed on the label of the PCH Portal.

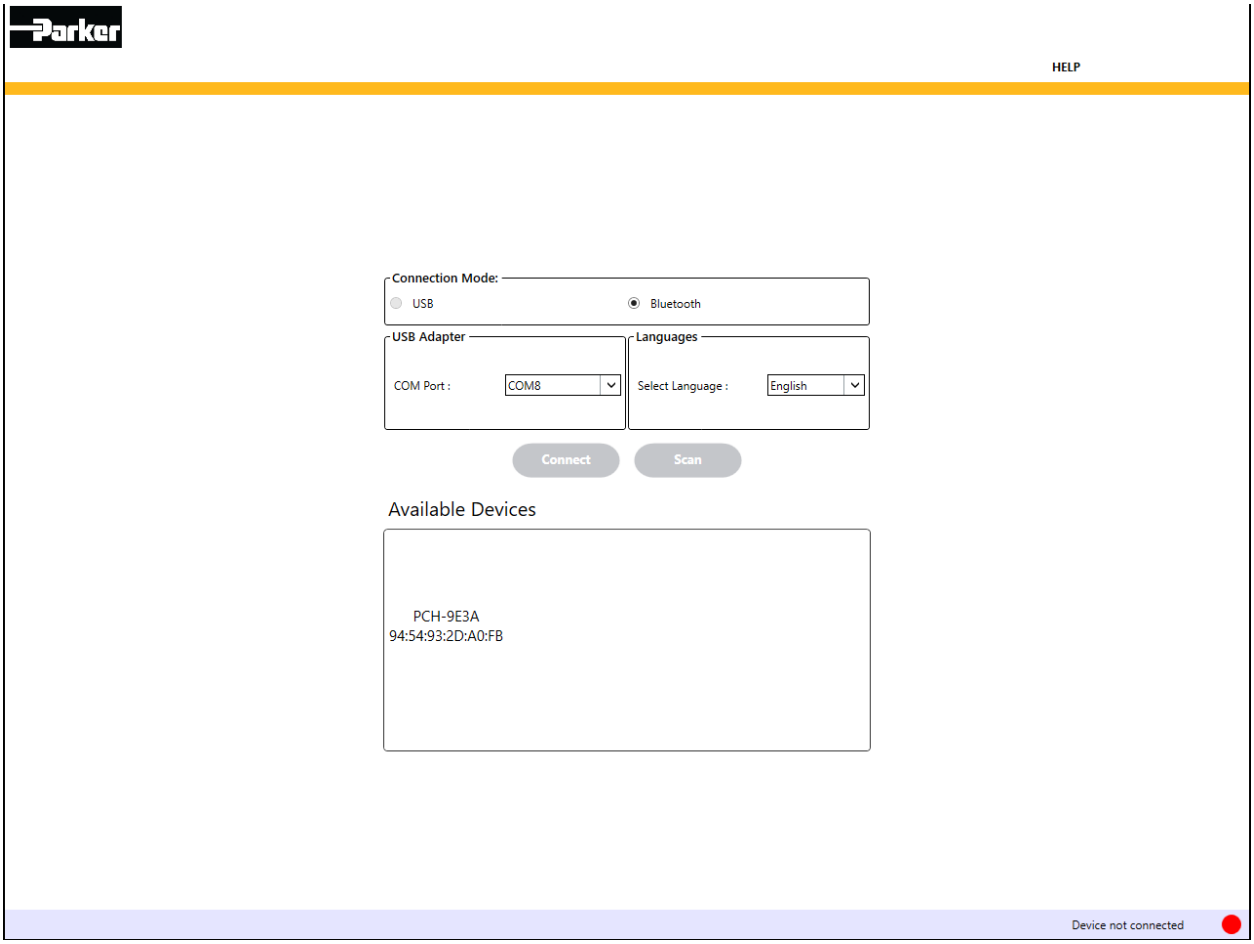


Figure 35 — Bluetooth connection screen

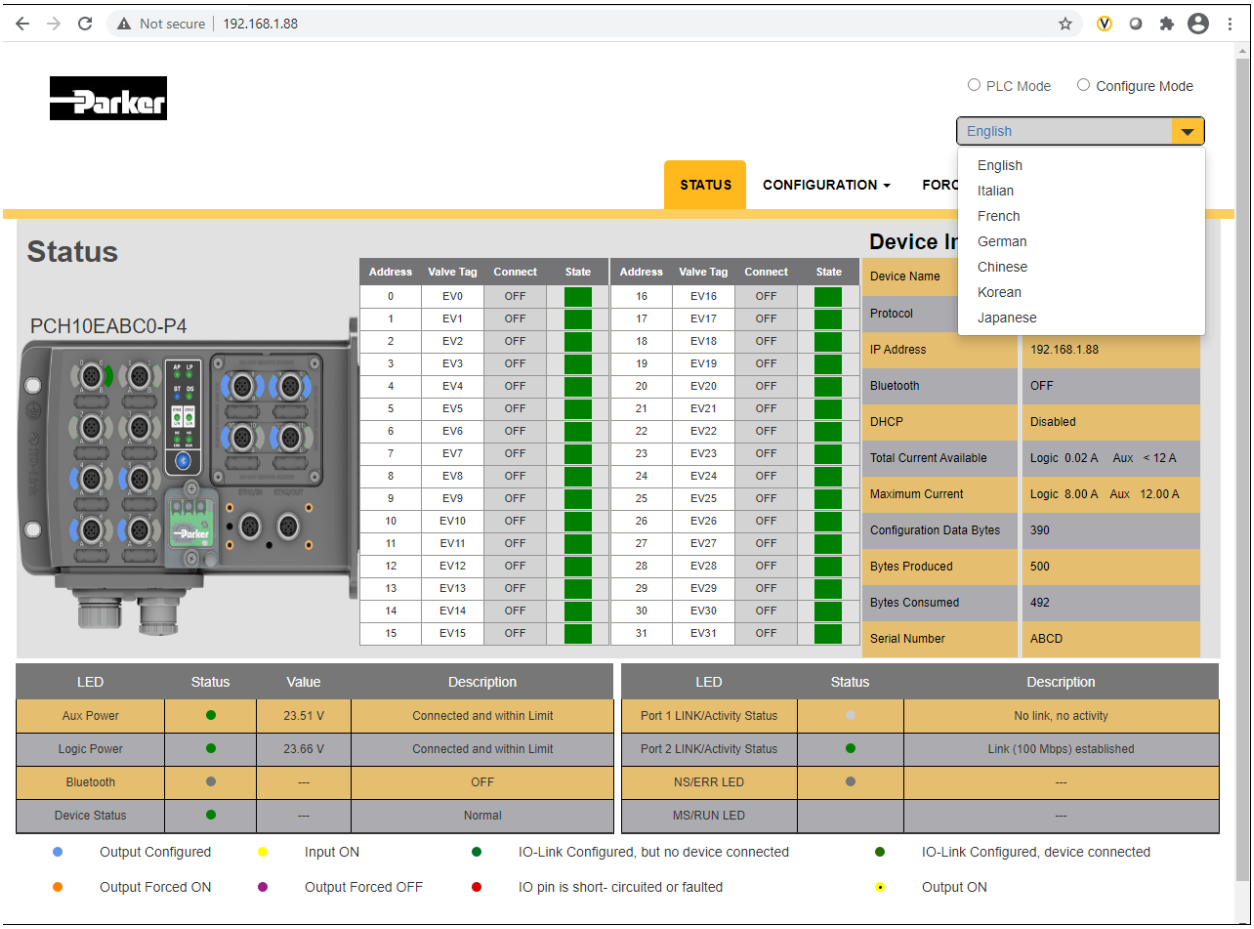


Figure 36 — Web Interface

NOTE:

a. PCH Portal web page supports Microsoft Edge, Google Chrome and Mozilla Firefox browsers only.
b. The GUI on web page is same as that on PC configuration tool.
c. Please use latest version of browsers.

To configure PCH Portal enter Configuration mode by clicking on the “Configure mode” radio button and providing a valid password. The default password is “parker”. Configuration (write) access to PCH Portal is granted if it is not already in configuration mode.

While the PCH is in Configuration mode, If the user connects the PLC, then the PLC does not gain control of the PCH until user releases the access from Configuration tool.

NOTE:

a. Screens automatically refresh so inactivity is not applicable until web browser is closed and utility is closed.
b. Once configuration mode is accessed by the PC Utility/Web server, the PLC cannot configure and actuate PCH Portal Outputs/Valves. PLC can read only inputs and device status from PCH Portal.

The “PLC Mode” radio button is selected if PLC is connected to the PCH Portal (refer to the upper right corner of the image below).

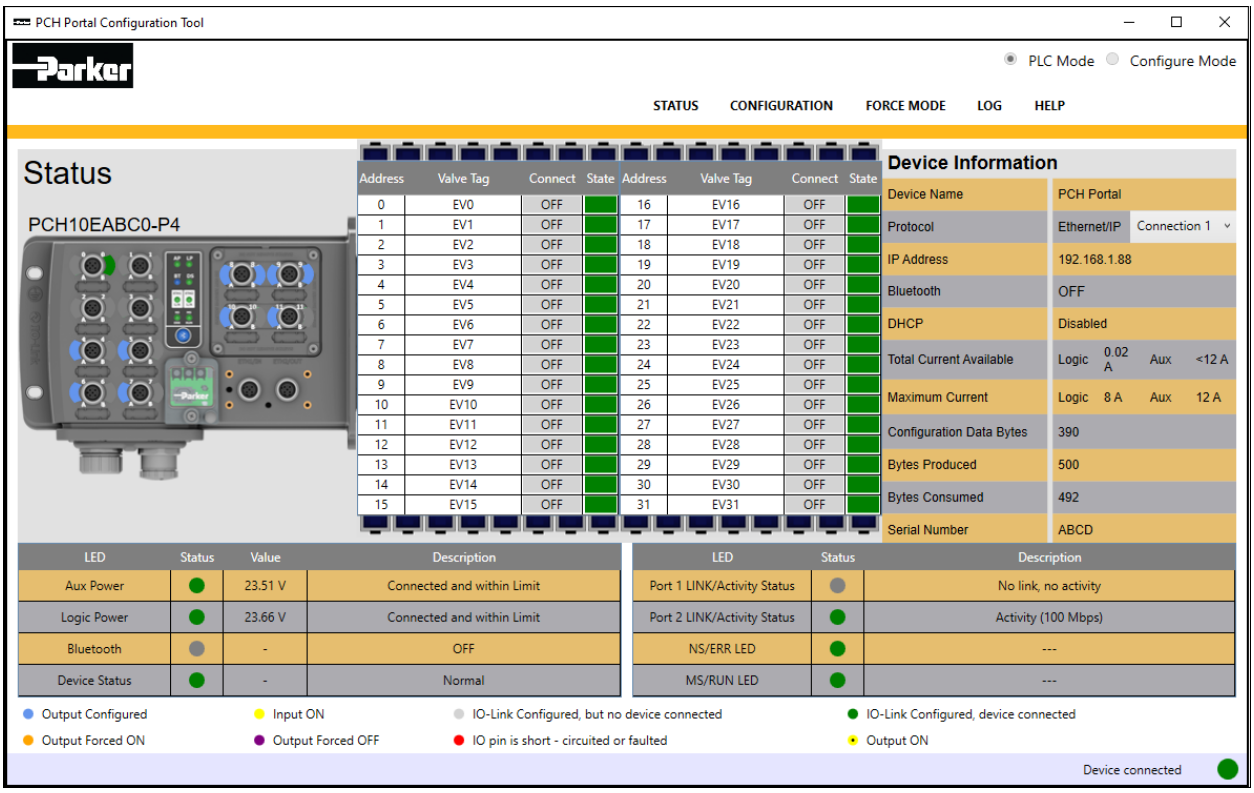


Figure 37 — “PLC Mode” radio button selected

5.1.1 Status Screen

The “Status” screen displays the live status of the PCH Portal. All the device information like protocol, IP address etc. is displayed in the table on the right hand side. The status of all the LEDs are displayed in the table at the bottom. Digital Input, Digital Output and IO-Link pin status is displayed on the device image on the left hand side.Valve status is displayed in the table at the center.

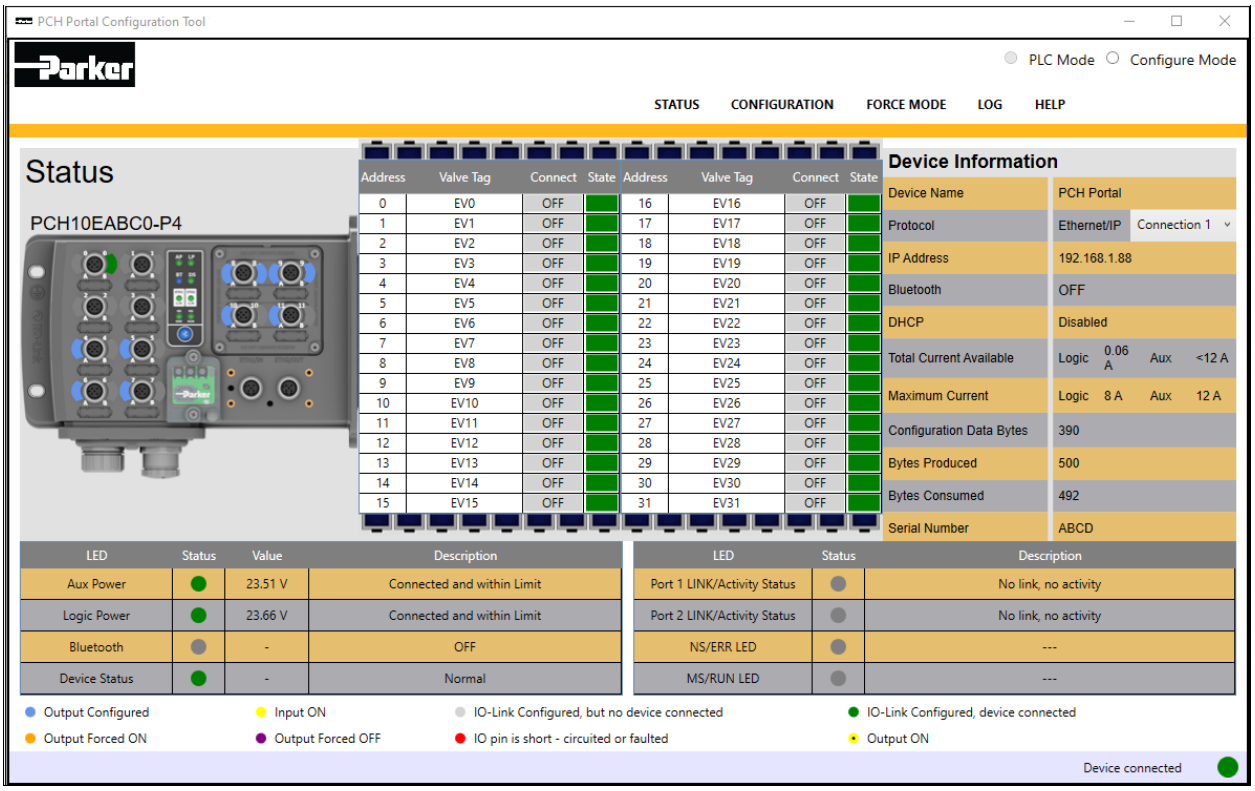


Figure 38 — Status Screen

5.1.2 Port Configuration Screen

The “Port Config” screen allows user to view or change the pin configuration of PCH Portal. User can make configuration changes from the pin images or from the “Port Configuration Detail” table.
Note: LED colors have different meanings between status and configuration screens.

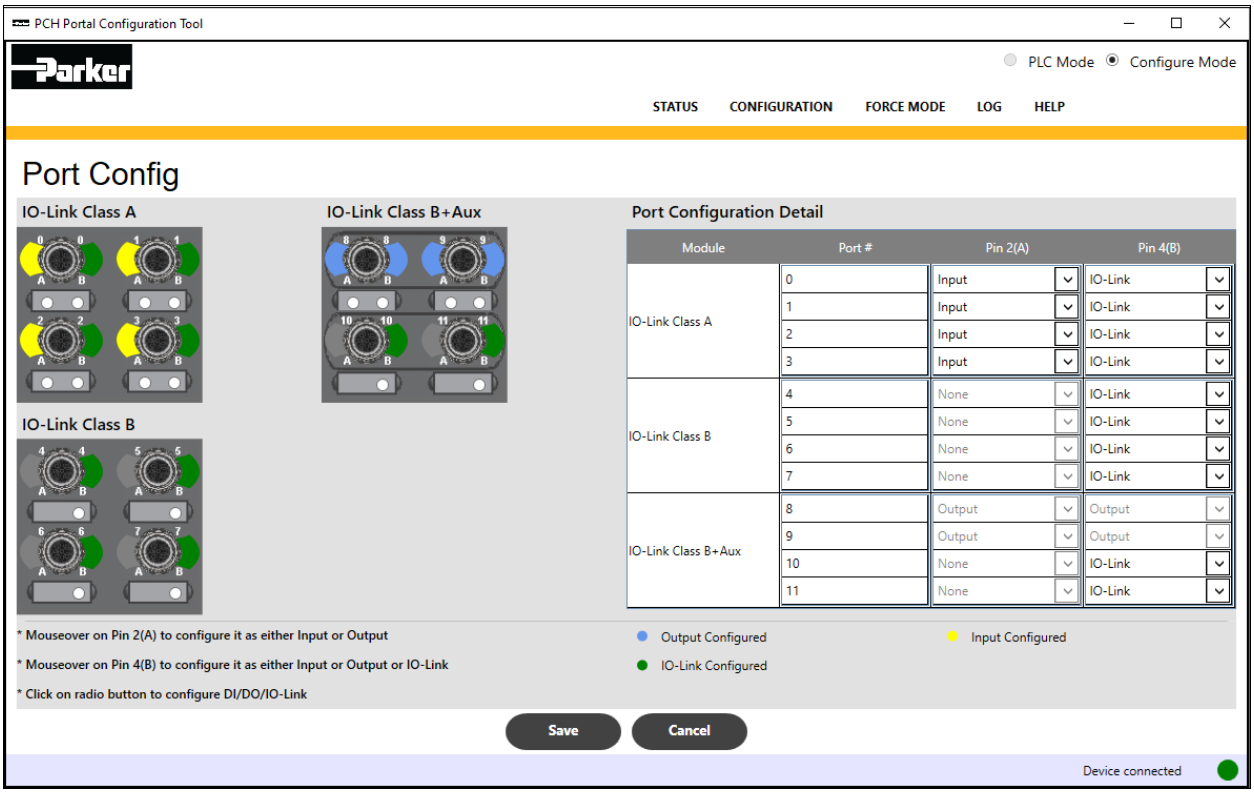


Figure 39 — Port Config Screen

5.1.3 Pin Config

The pin configuration can also be changed from the “Pin Config” tree structure.

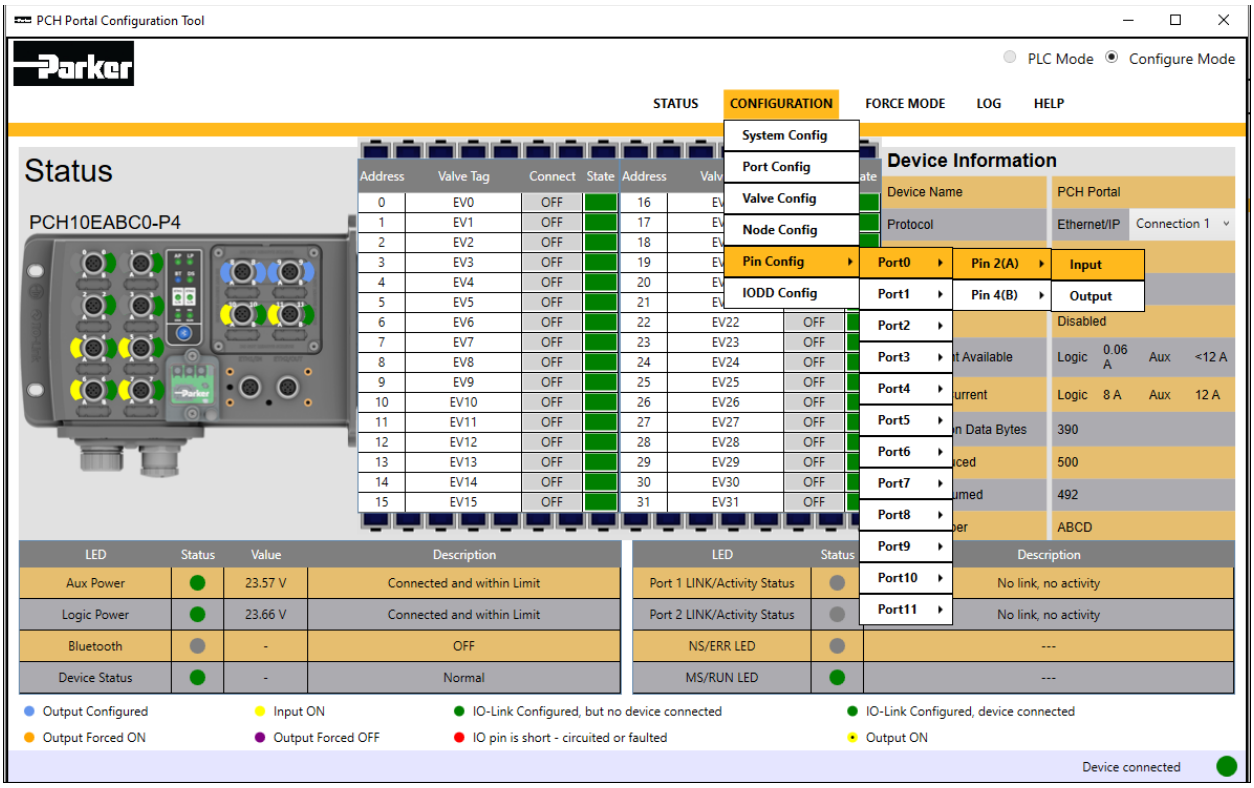


Figure 40 — Pin Configuration Changes

To see or change the configuration details for a particular Digital Input/Digital Output/IO-Link pin, select the appropriate radio button on the PCH Portal graphic in the “Port Config” screen.

5.1.4 Digital Input Configuration Screen

User can see or change the below parameters on this screen:

a. Description of Channel
b. Digital Input Type
c. Invert
d. Debounce Time
e. Cycle Warning Mode
f. Cycle Count Type
g. Upcounter cycle count notification limit/Downcounting preset to 0
h. Cycle Reset

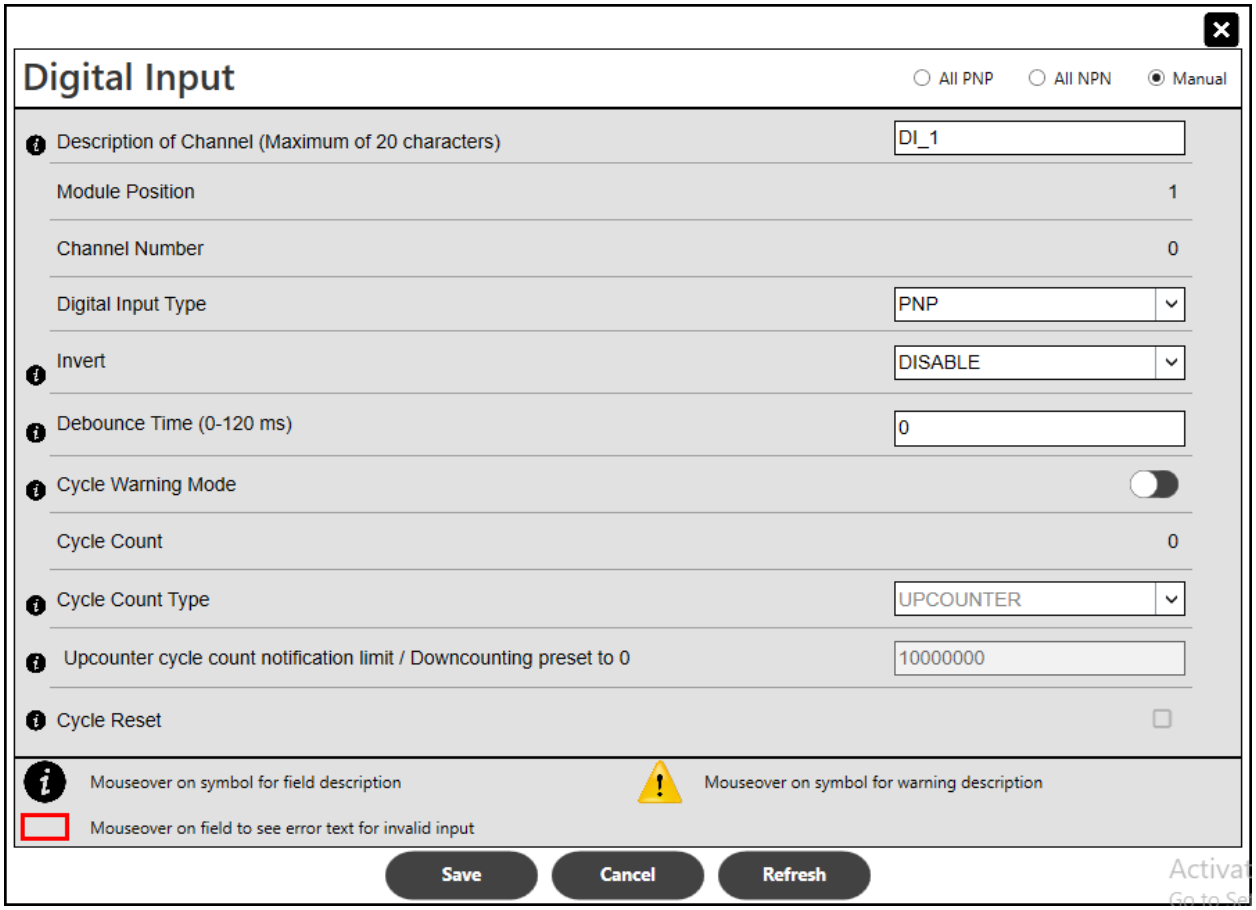


Figure 41 — Digital Input Configuration Screen

5.1.5 Digital Output Configuration Screen

a. Description of Channel
b. Fault Mode
c. Cycle Warning Mode
d. Cycle Count Type
e. Upcounter cycle count notification limit/Downcounting preset to 0
f. Cycle Reset

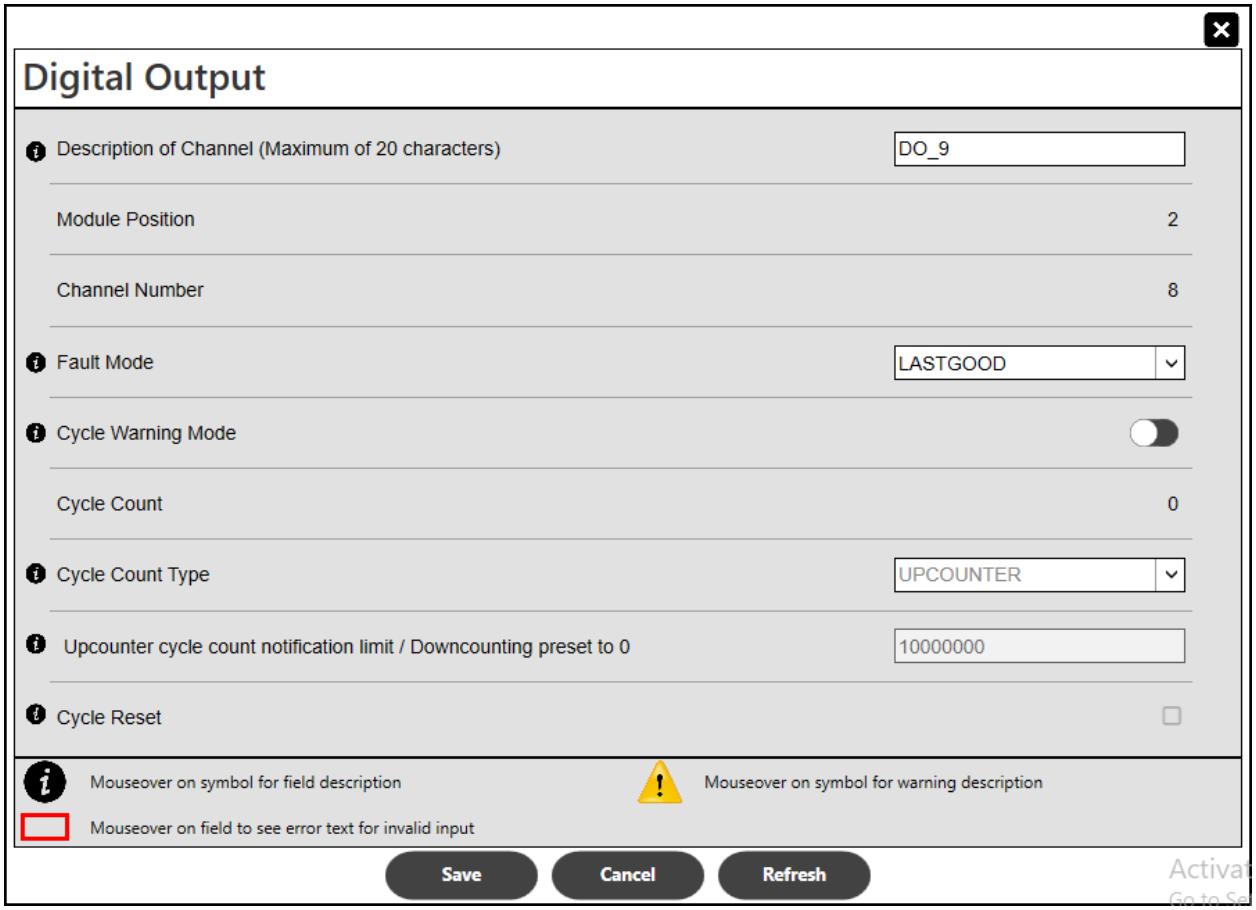


Figure 42 — Digital Output Configuration Screen

5.1.6 IO-Link Port Configuration Screen

a. The live data from the connected IO-Link slave device is displayed under the “Device Information” section.
b. The data in the “Optional Device Information” section is fetched when “Get Info” button is pressed.
c. User can change the “Data Storage”, “Inspection Level” and “Cycle Time” from this screen as long as it is in “Configuration Mode”.
d. User can read/writeParameter data by entering the Index and Sub-Index in the “Parameter” section.
e. User can see the cyclic input or can change the cyclic output from the “Process Data” section by selecting the “*i* ” icon.
f. The Parameter Content section displays the parameters and their respective data of the IO-Link slave device as long as the IODD file has been uploaded to the PCH Portal. Reference section 9 for IODD file management.
g. “Read All” button reads all the parameter data from the connected IO-Link slave device and updates data into parameter content table.
h. The “Data Storage” section at the bottom displays the “Device ID” and “Vendor ID” of the IO-Link slave device whose parameters have been uploaded on the current port.

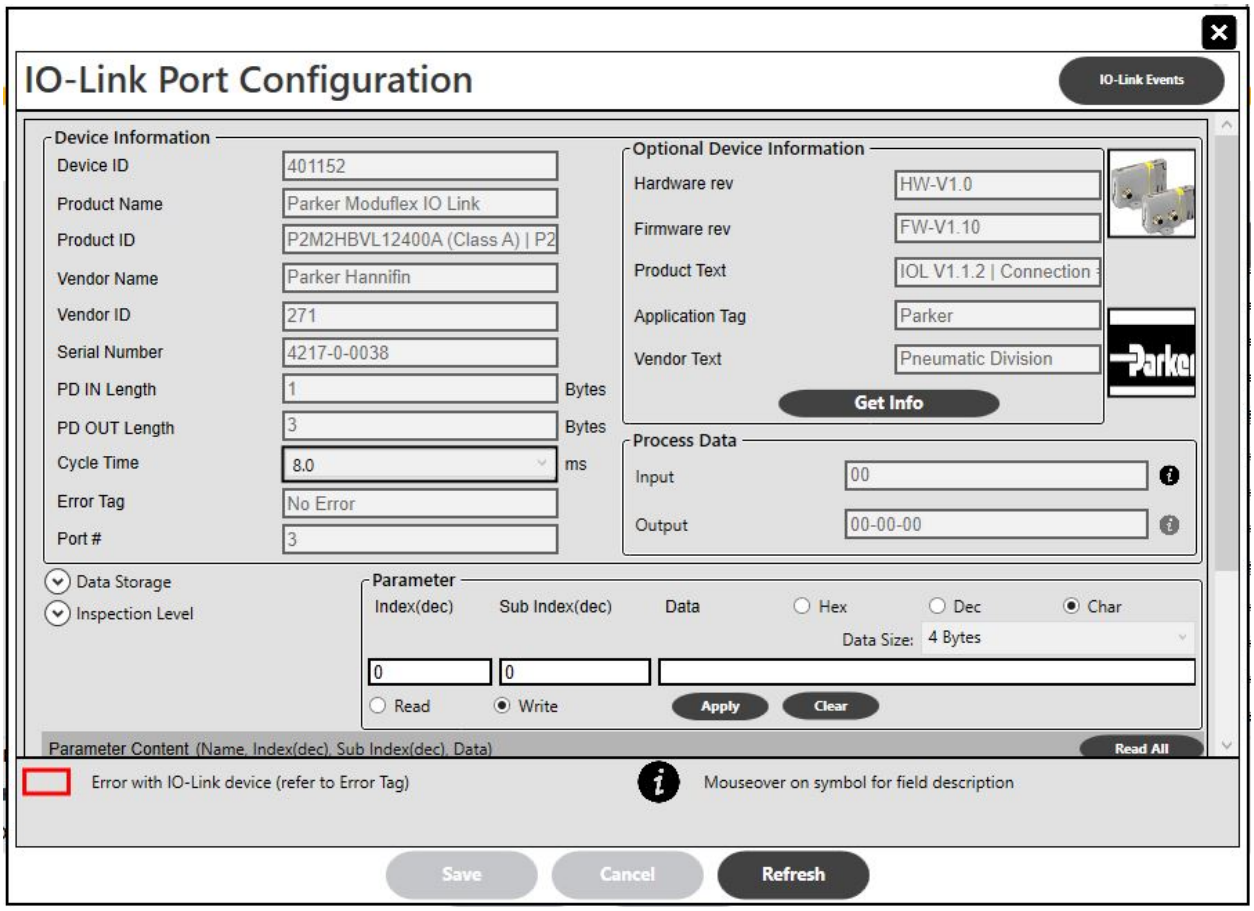


Figure 43 — IO-Link Port Configuration Screen

5.1.7 IO-Link Events Screen

Events related to IO-Link are logged in the “IO-Link Events” screen of the respective IO-Link port. The IO-Link Events” screen is accessed by selecting the “IO-Link Events” button as shown in Figure 44. User has to refresh this screen to see new logs. User can export these logs in CSV format. User can also clear the logs as long as they are in “Configuration Mode”.

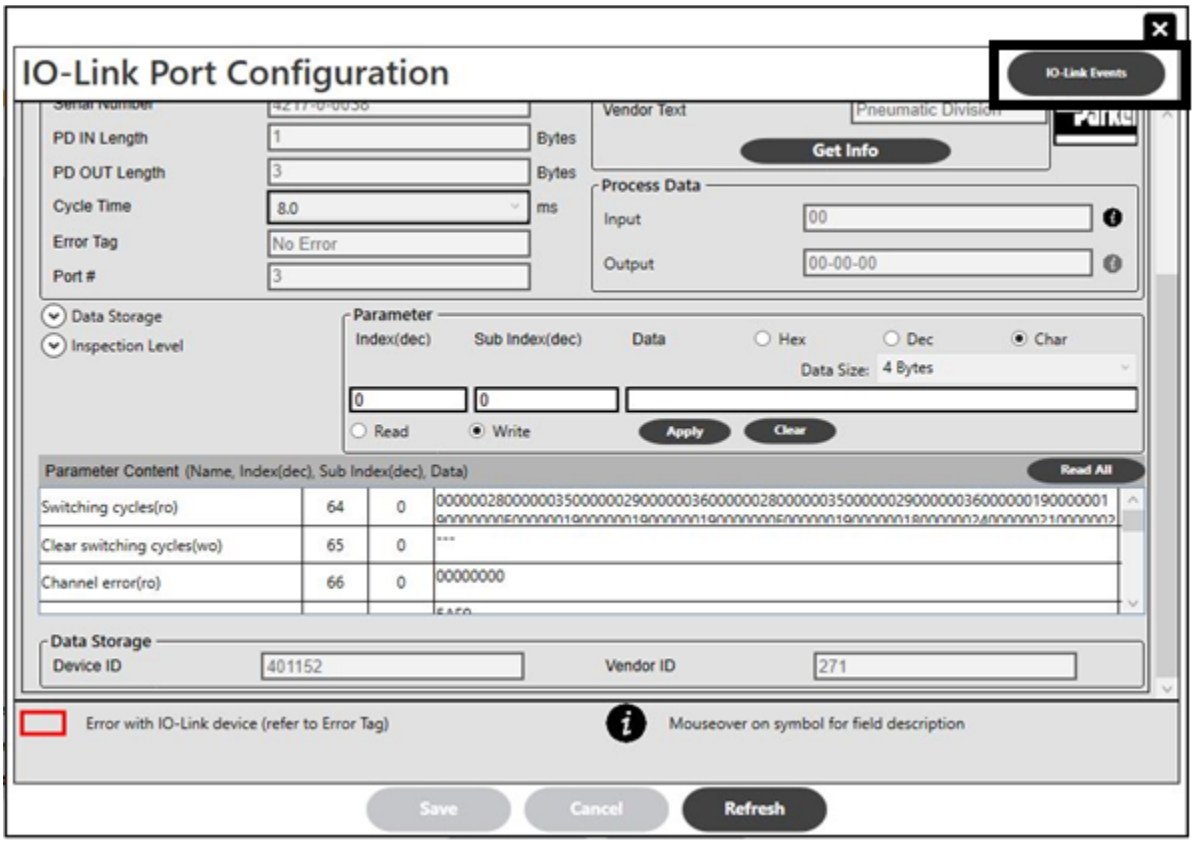


Figure 44 — Navigation to IO-Link Event

NOTE:

a) A maximum of 30 events are logged at a time.
b) “Read All” button reads “Read only” and “Read Write” parameter data and updates into parameter content table as long as the IODD file has been uploaded to the PCH Portal. Reference section 9 for IODD file management.

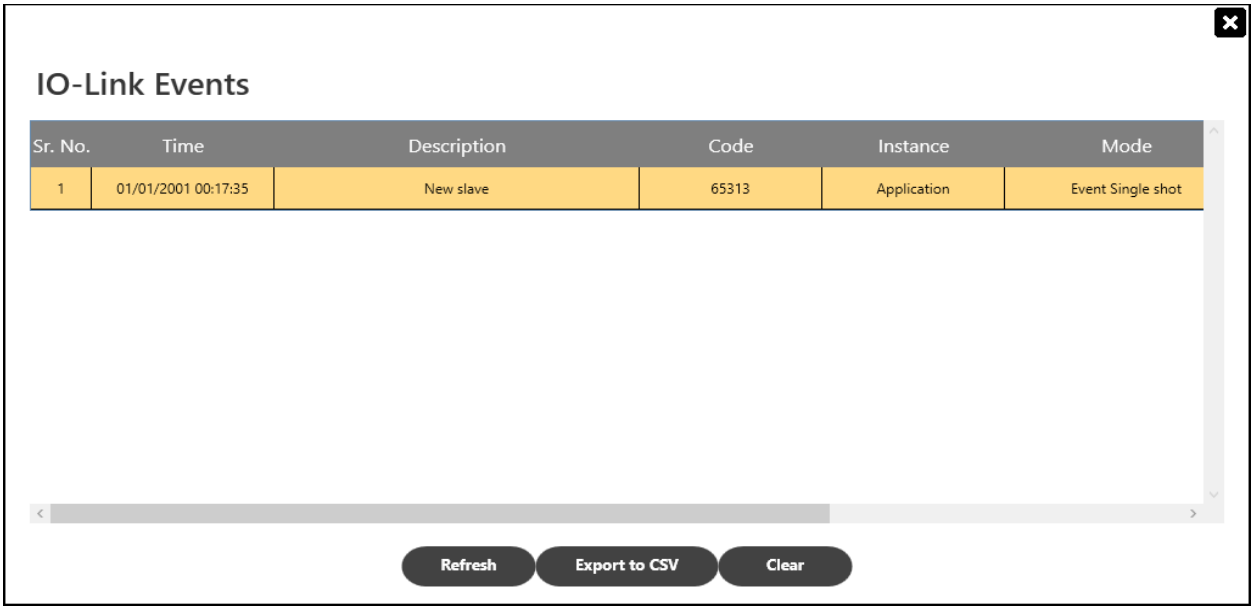


Figure 45 — IO Link Event Screen

5.1.8 Valve Configuration Screen

The “Valve Config” screen is used to change the configuration of any Valve. The following parameters of valves can be changed through Valve Config Screen:

a. Valve Tag
b. Fault Mode
c. Cycle Warning mode
d. Cycle Count Type
e. Cycle Limit
f. Cycle Reset

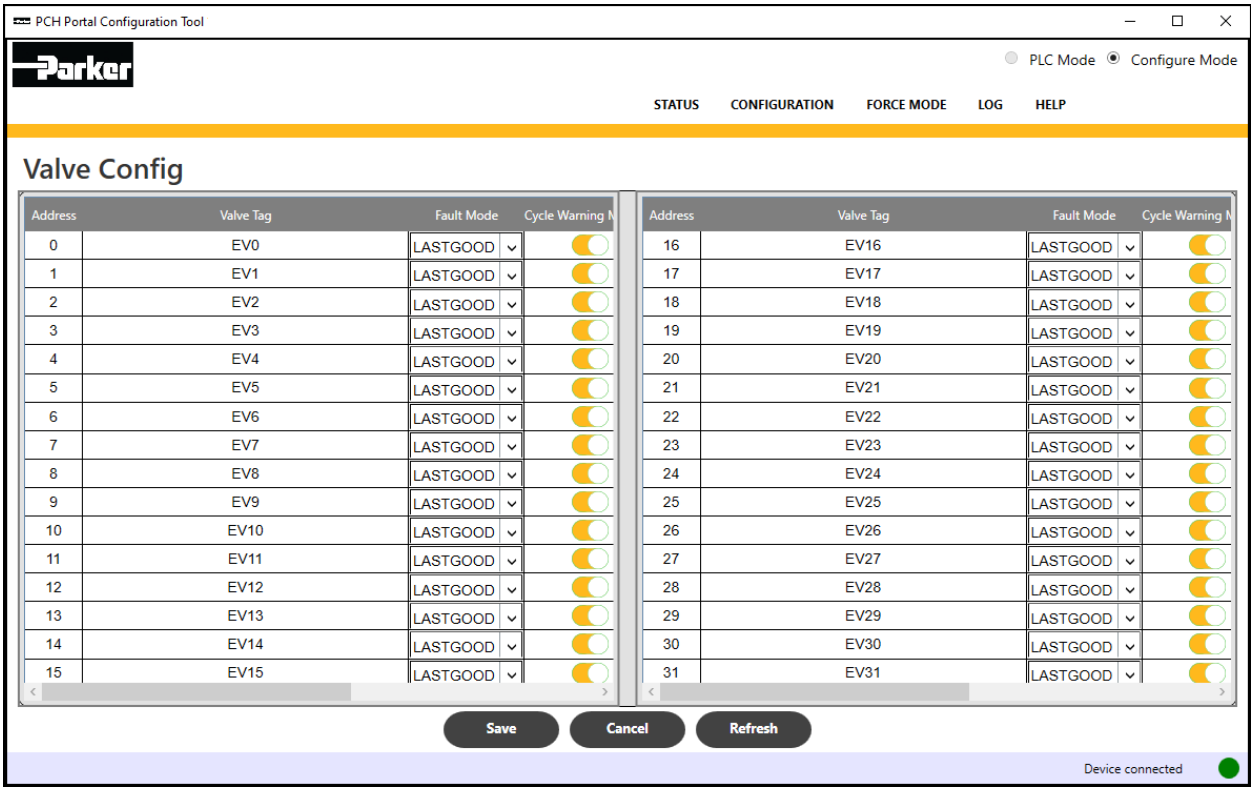


Figure 46 — Valve Config

5.1.9 IODD Configuration Screen

The “IODD Config” screen is used to upload an IODD file to the PCH Portal IODD library in the device or delete an IODD file from PCH Portal IODD library. IODD files are loaded into the IODD library regardless of what IO-Link port they are, or will be, connected to.

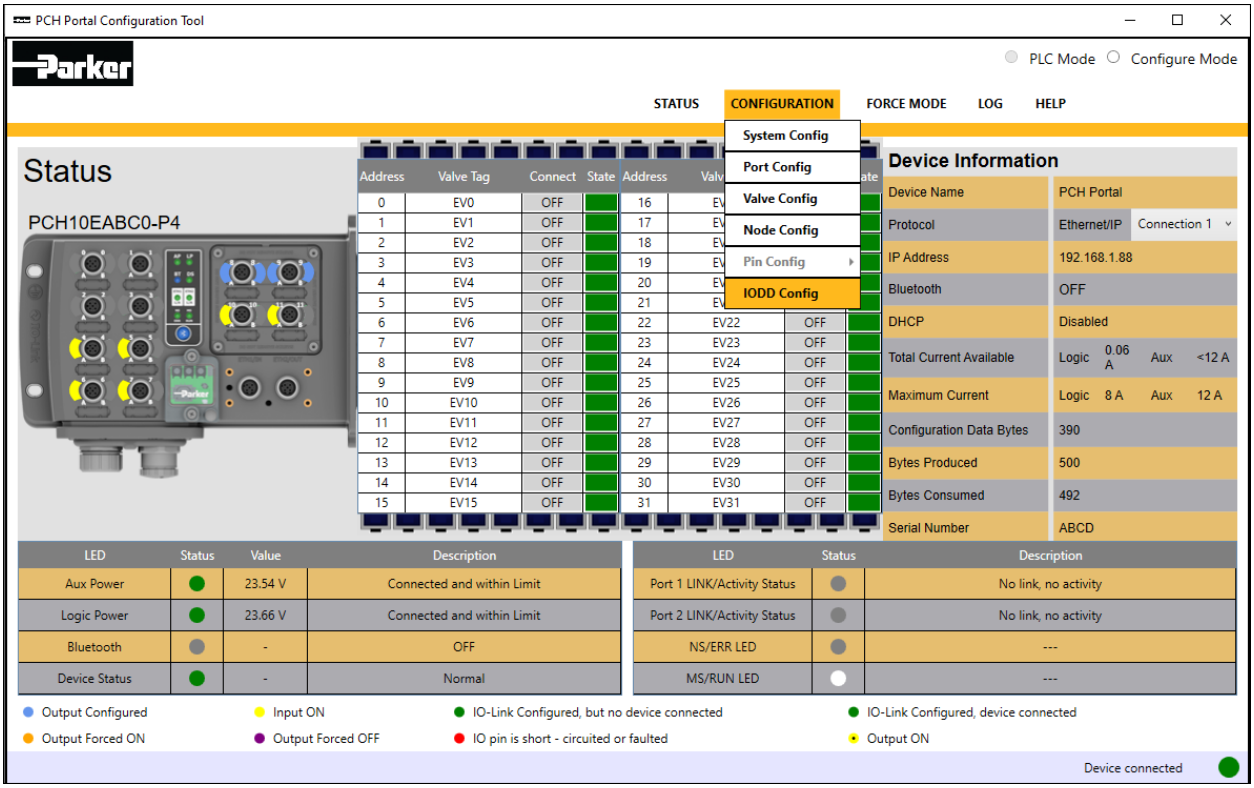


Figure 47 — Navigation to IODD Configuration screen

NOTE:

a. After uploading an IODD file, device image and vendor logo gets updated automatically, but in web interface user must upload the device image and vendor logo manually after uploading the IODD file.

b. User does not need configuration access to upload/delete IODD files

c. User can upload maximum 12 IODD files into the PCH portal.

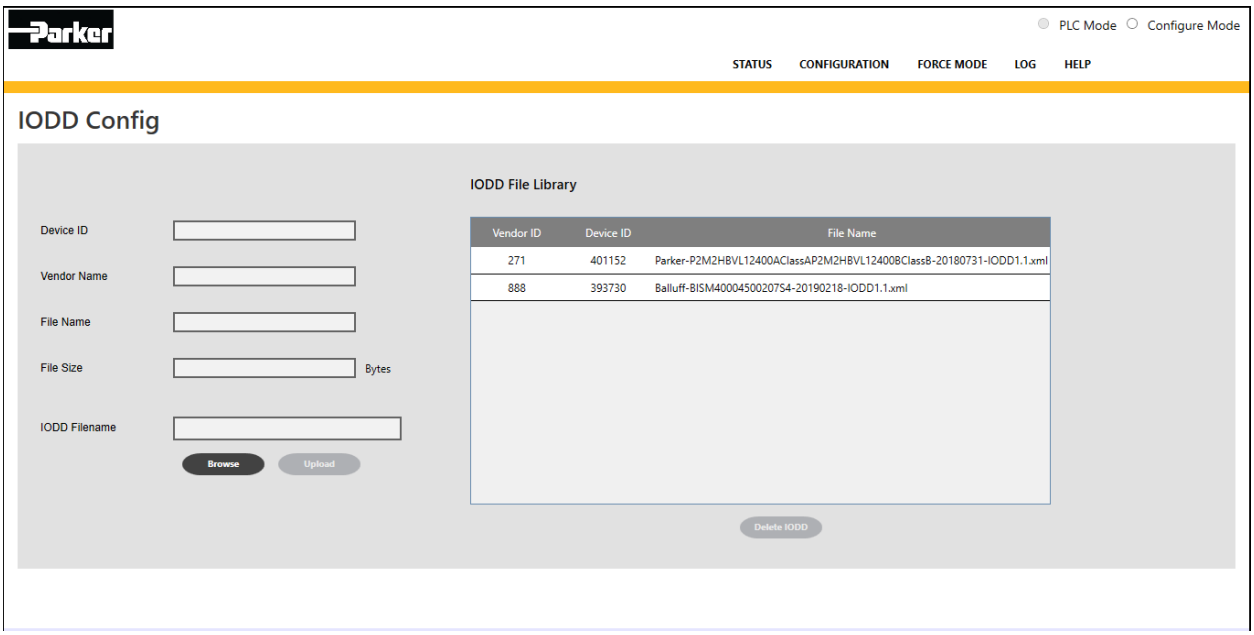


Figure 48 — IODD Config

5.1.10 Force Mode Screen

To actuate DO/Valves of PCH Portal enter Force mode by clicking on “Force mode” tab, then click on the slider button and provide valid password. The default password is “parker”. Access to PCH Portal force mode is granted if it is not already in force mode. User has to click on the radio buttons or on the Valve’s “Connect” column to actuate the Digital Outputs and Valves respectively.

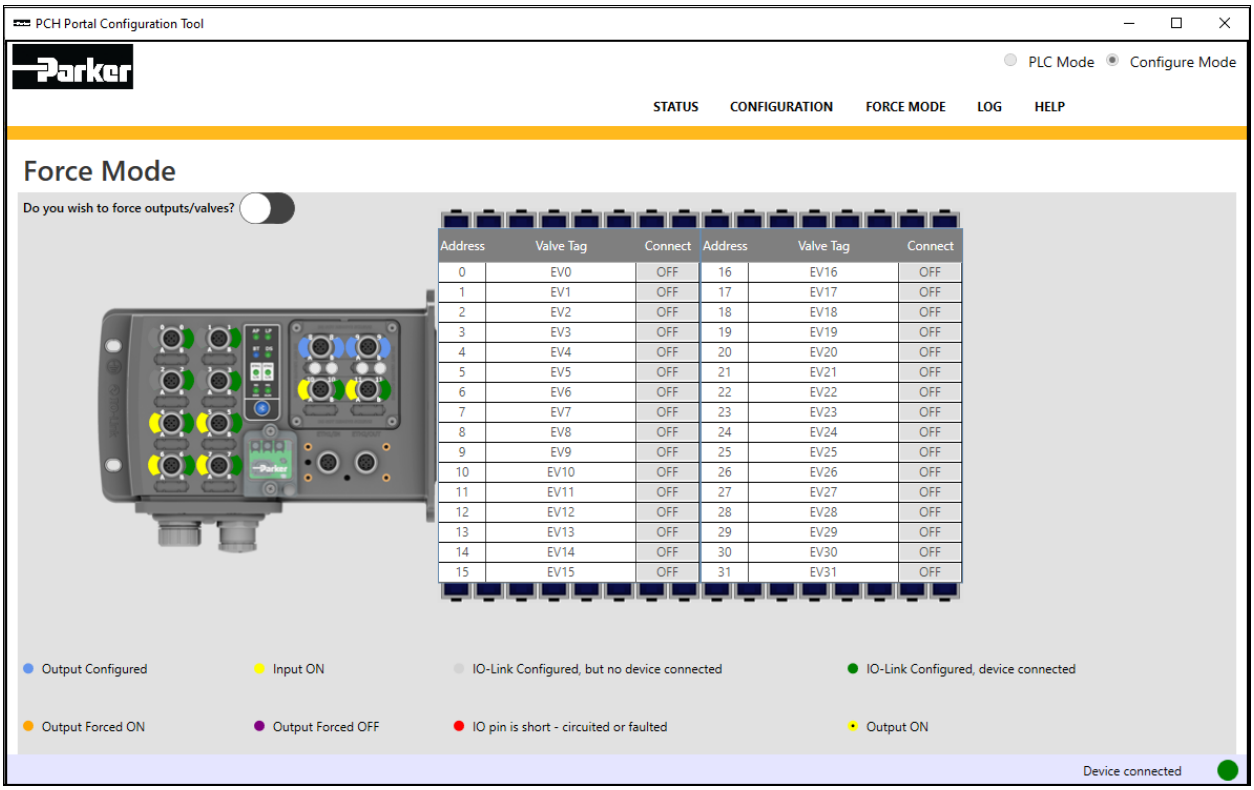


Figure 49 — Force Mode screen

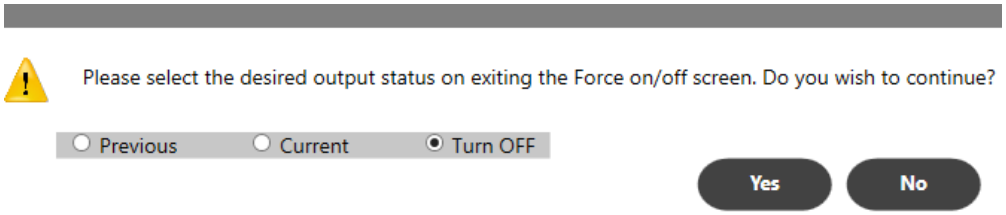


Figure 50 — Force Mode Output Status

On exiting the Force ON/OFF Screen, the user needs to select either Previous, Current, or Turn OFF option, which impacts Values and Digital Outputs.

5.1.11 Help Screen

User can click on the “HELP” tab to open the detailed GUI Help manual document.

5.1.12 System Configuration Screen

The “System Configuration” screen displays the system wide parameters such as date, time, network configuration addresses, MAC address, System ON Time, and Bluetooth configuration settings.Some of these parameters are user configurable in configuration mode.

QC modes : for EtherNET/IP – OFF, Quick/Fast Boot, QuickConnect-250

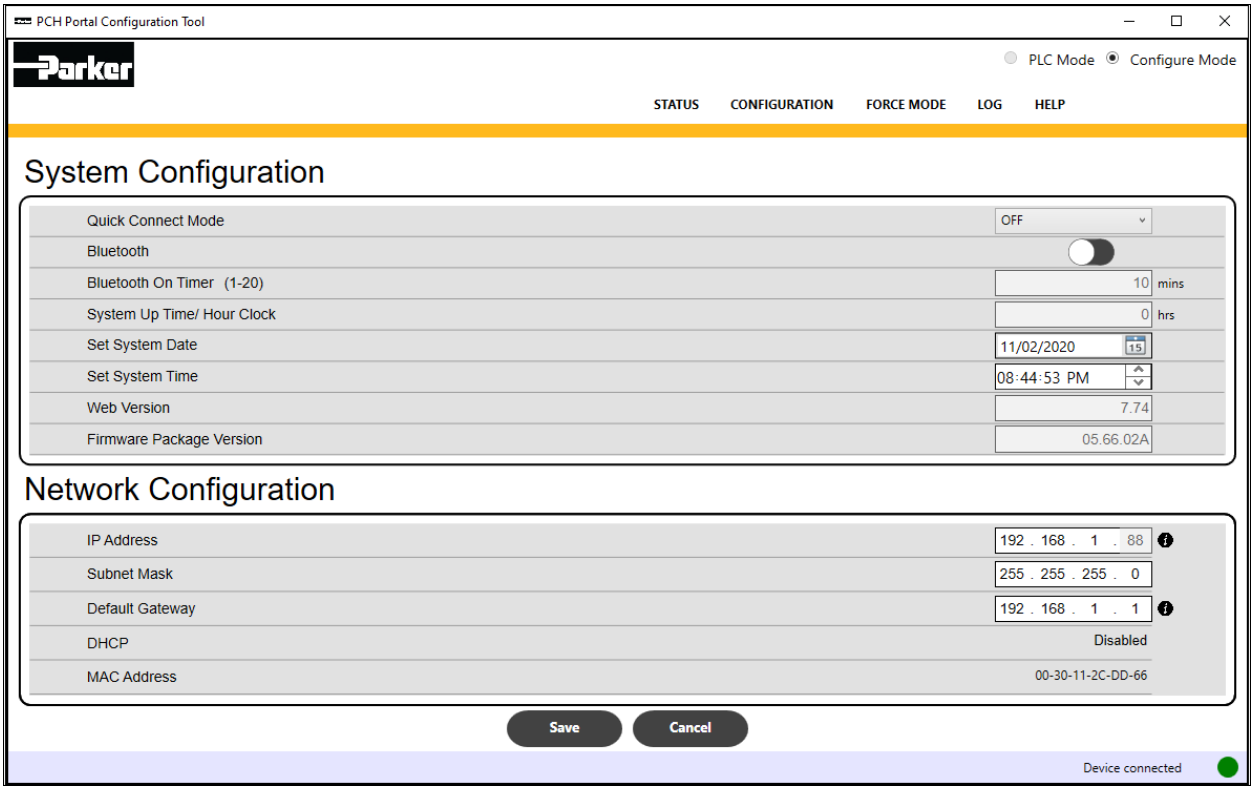


Figure 51 — System Configuration

5.1.13 Node Configuration Screen

The “Node Configuration” page provides the capabillity to save the configuration of the PCH device to connected PC/laptop, as well as to load the saved configuration from pc/laptop to PCH device.
It also provides the option to restore the PCH device to its factory default settings.

NOTE: In Restore to Factory Default option the PCH Portal device data will be cleared. It takes around 15 seconds to perform this operation. Restore in Progress” is indicated via blinking cyan DS LED.

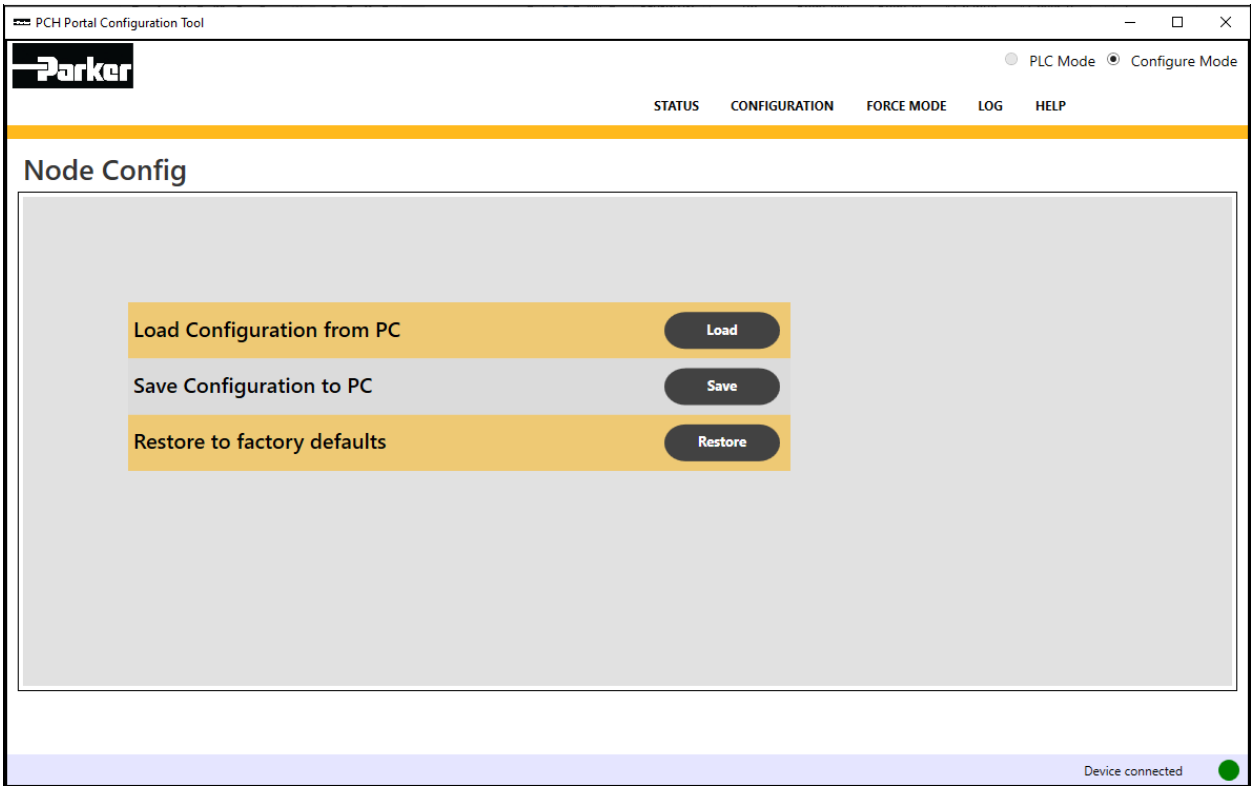


Figure 52 — Node Config

5.1.14 Logs:Screen

The “LOGS” tab displays three options “Warnings”, “Events” and “Errors”. All the events provide time/date stamp details as well as module information. It also provides the user action required to recover from the Error and Events.

NOTE: A maximum 40 events are logged at a time.

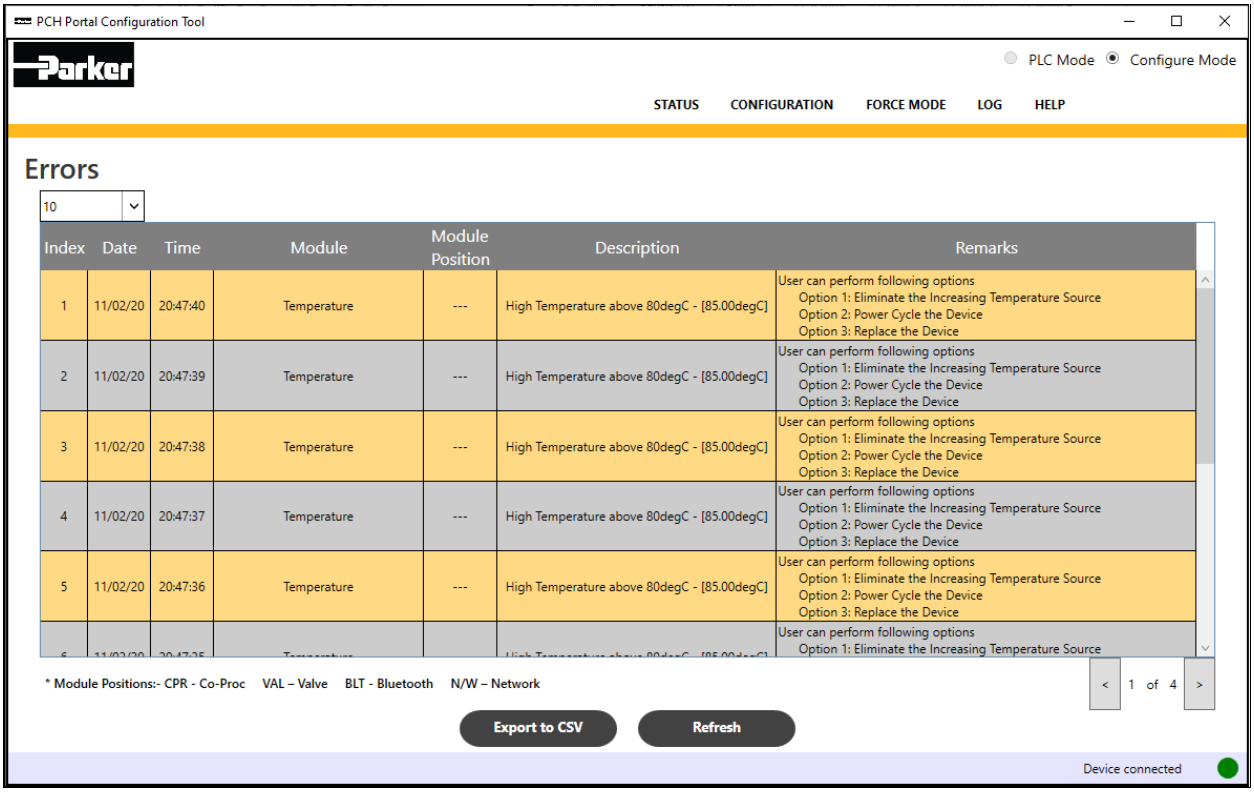


Figure 53 — LOGS

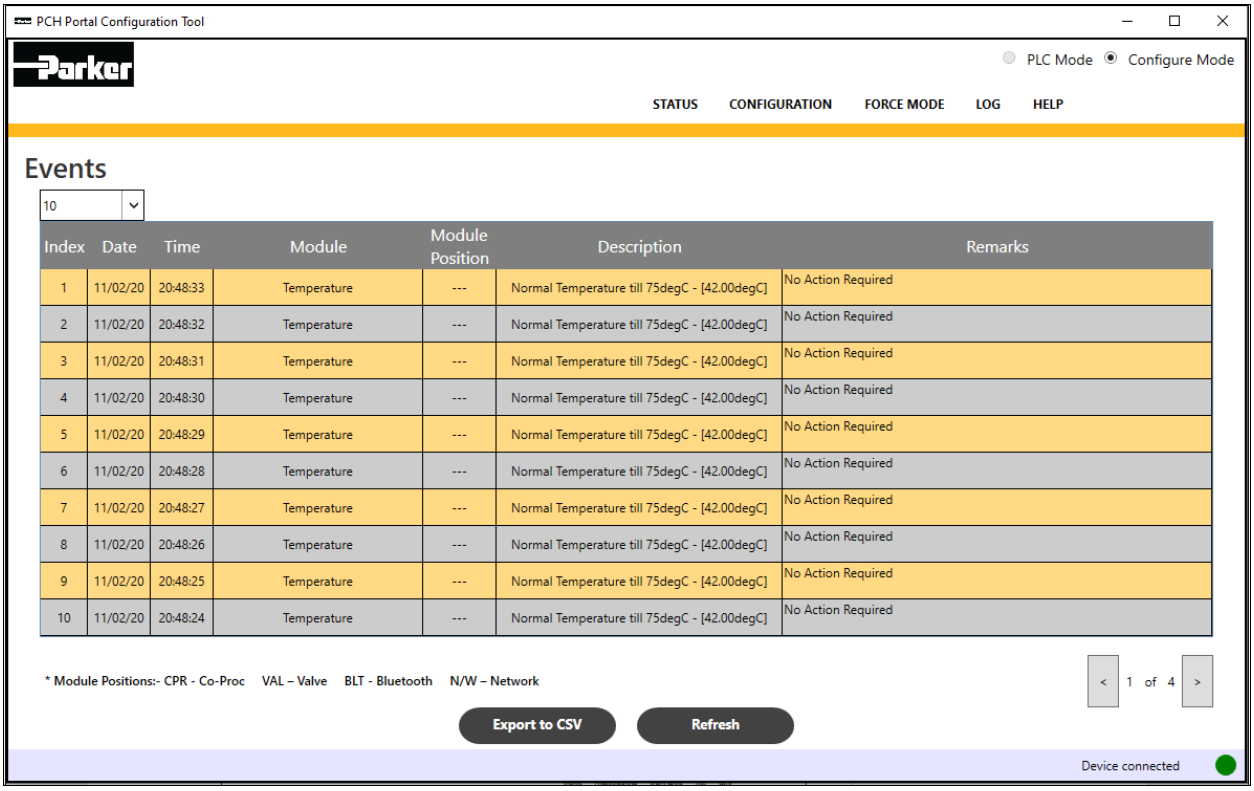


Figure 54 — LOGS

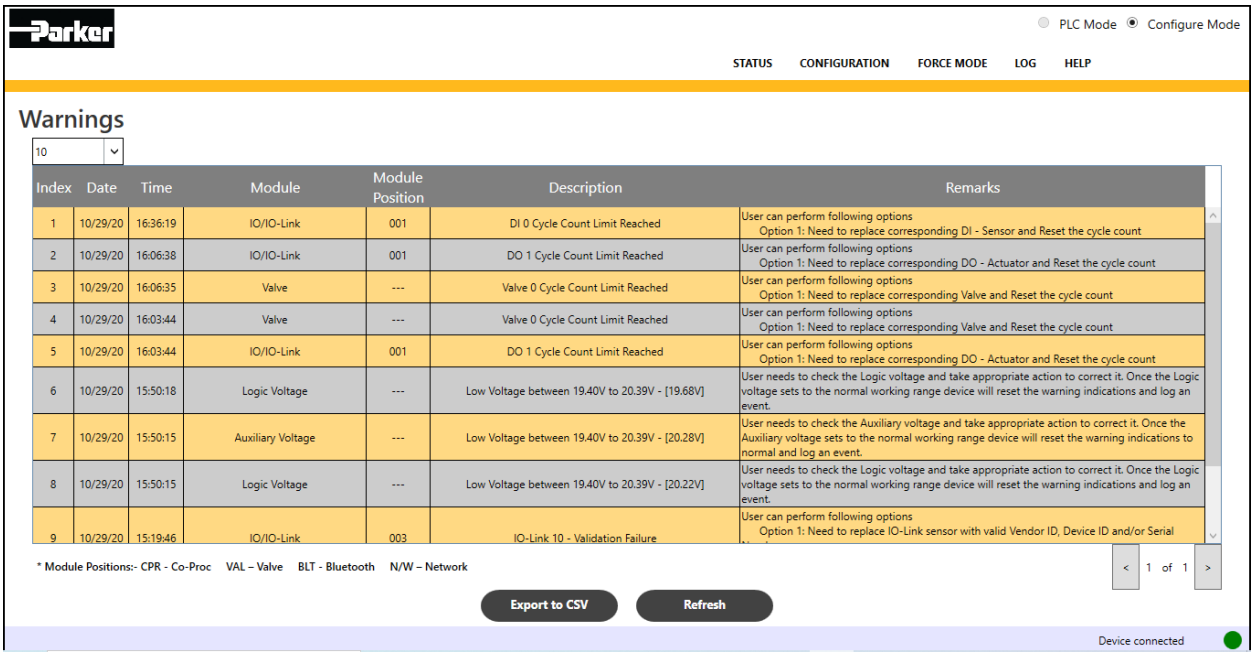


Figure 55 — LOGS

5.2 Bluetooth Mobile Application

The Bluetooth mobile application is also available to view status and configure the PCH Portal. This Bluetooth application is available for Android and iOS mobile devices and tablets. Please download the application from app store and install to your mobile devicet to get connected with PCH Portal over Bluetooth interface.

Please ensure Bluetooth communication of PCH Portal is turned ON before connecting . It can be turned on via configuration tool/web interface or by pressing Bluetooth button (and holding for more than 3 seconds) on Bluetooth module. Bluetooth LED flashes and turns solid when connected to the phone or tablet.

CHAPTER - 6 **Troubleshooting**

6.1 Troubleshooting

Table 51 — Troubleshooting Information

Description	Area/ Module	Category	Event Log Message Format: Date | Time | Module | Module Position | Description	Process Input Status Bits	User Actions Note: The User Actions are displayed in the Remark column for Log screen
Auxiliary Power - Low Voltage below 19.40V (Hysteresis 19.60V) Note: Under voltage cut-off:14.70V Under voltage cut-off recovery:15.70V	Auxiliary Voltage	Error	MM-DD-YY | HRS:MIN:SEC | Auxiliary Voltage | --- | Low Voltage below 19.40V - [<Actual Voltage>V]	Aux Voltage bit = 1 Error bit = 1	# User needs to check the Auxiliary voltage and take appropriate action to correct it. Once the Auxiliary voltage sets to the normal working range, the device resets the error indications to normal and log an event.
Auxiliary Power - Low Voltage between 19.40V to 20.40V (Hysteresis 19.60V to 20.60V)		Warning	MM-DD-YY | HRS:MIN:SEC | Auxiliary Voltage | --- | Low Voltage between 19.40V to 20.39V - [<Actual Voltage>V]	Aux Voltage bit = 1 Warning bit = 1	# User needs to check the Auxiliary voltage and take appropriate action to correct it. Once the Auxiliary voltage sets to the normal working range, the device resets the warning indications to normal and log an event.
Auxiliary Power - Voltage between 20.40V to 28.80V (Hysteresis 20.60V to 28.60V)		Event	MM-DD-YY | HRS:MIN:SEC | Auxiliary Voltage | --- | Normal Voltage between 20.40V to 28.80V - [<Actual Voltage>V]	NA	# No Action Required
Auxiliary Power - High Voltage between 28.80V to 29.50V (Hysteresis 28.60V to 29.30V)		Warning	MM-DD-YY | HRS:MIN:SEC | Auxiliary Voltage | --- | High Voltage between 28.81V to 29.50V - [<Actual Voltage>V]	Aux Voltage bit = 1 Warning bit = 1	# User needs to check the Auxiliary voltage and take appropriate action to correct it. Once the Auxiliary voltage sets to the normal working range, the device resets the warning indications to normal and log an event.
Auxiliary Power - High Voltage above 29.50V (Hysteresis 29.30V) Note: Overvoltage cut-off 30.00 V Overvoltage cut-off recovery :29.50V		Error	MM-DD-YY | HRS:MIN:SEC | Auxiliary Voltage | --- | High Voltage above 29.50V - [<Actual Voltage>V]	Aux Voltage bit = 1 Error bit = 1	# User needs to check the Auxiliary voltage and take appropriate action to correct it. Once the Auxiliary voltage sets to the normal working range, the device resets the error indications to normal and log an event.
Logic Voltage below ~16.00V <Shutdown> Note: This event is not logged, only indicatorsare mentioned wherever applicable Note: Under voltage cut-off:14.70V Under voltage cut-off recovery:15.70V	Logic Voltage	---	---	NA	# Power is below min limits the unit does not power ON until the voltage is above min limits.
Logic Power - Low Voltage between below 19.40V (Hysteresis 19.60V)		Error	MM-DD-YY | HRS:MIN:SEC | Logic Voltage | --- | Low Voltage below 19.40V - [<Actual Voltage>V]	Logic Voltage bit = 1 Error bit = 1	# User needs to check the Logic voltage and take appropriate action to correct it. Once the Logic voltage sets to the normal working range, the device resets the error indications to normal and log an event.
Logic Power - Low Voltage between 19.40V to 20.40V (Hysteresis 19.60V to 20.60V)		Warning	MM-DD-YY | HRS:MIN:SEC | Logic Voltage | --- | Low Voltage between 19.40V to 20.39V - [<Actual Voltage>V]	Logic Voltage bit = 1 Warning bit = 1	# User needs to check the Logic voltage and take appropriate action to correct it. Once the Logic voltage sets to the normal working range, the device resets the warning indications and log an event.
Logic Power - Voltage between 20.40V to 28.80V (Hysteresis 20.60V to 28.60V)		Event	MM-DD-YY | HRS:MIN:SEC | Logic Voltage | --- | Normal Voltage between 20.40V to 28.80V - [<Actual Voltage>V]	NA	# No Action Required

Description	Area/ Module	Category	Event Log Message Format: Date | Time | Module | Module Position | Description	Process Input Status Bits	User Actions Note: The User Actions are displayed in the Remark column for Log screen
Logic Power - High Voltage above 28.80V (Hysteresis 28.60V)	Logic Voltage	Warning	MM-DD-YY | HRS:MIN:SEC | Logic Voltage | --- | High Voltage above 28.80V - [<Actual Voltage>V]	Logic Voltage bit = 1 Warning bit = 1	# User needs to check the Logic voltage and take appropriate action to correct it. Once the Logic voltage sets to the normal working range, the device resets the warning indications and log an event.
Logic Voltage above ~29.50V <Shutdown> Note: This event is not logged, only indicatorsare mentioned wherever applicable Note: Overvoltage cut-off 30.00 V Overvoltage cut-off recovery: 29.50V		---	---	NA	# Power is below min limits the unit does not power ON until the voltage is above min limits.
Model Specification Mismatch Note: For this event no information is updated in any Data map for PLC. It is notified only through Device/Configuration Tool Indicators and Message Logging	MS/Co-Proc	Error	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | <Module Position>| Model Specification Mismatch where <Module Position> for IO Modules is indicated as 001 - Module Position 1 002 - Module Position 2 003 - Module Position 3 and Other modules are indicated as N/W - Network Module (this indicates Protocol Mismatch) VAL - Valve Module	NA	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Upgrade Firmware of the Device Option 3: Replace the IO Module as per configured Model Specification Option 4: Replace the Device
Device in Bootloader This occurs when device fails to jump from Boot mode to Application mode due to Application image corruption Note: This event is not logged, only indicator is mentioned wherever applicable		Error	---	NA	# User can perform the following options: Option 1: Upgrade Firmware of the Device Option 2: Replace the Device
Device Started		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Device Started	NA	No Action Required
Quick Connect Success		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Quick Connect Success	NA	No Action Required
Quick Connect Failed		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Quick Connect Failed	NA	No Action Required, Since Device continues in Normal mode of Operation
Backplane Initialization Failed		Error	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Backplane Initialization Failed	MS/CoProc bit = 1 Error bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Upgrade Firmware of the Device (i.e. to upgrade I/O module firmware) Option 3: Replace the Device

Description	Area/ Module	Category	Event Log Message Format: Date | Time | Module | Module Position | Description	Process Input Status Bits	User Actions Note: The User Actions are displayed in the Remark column for Log screen
B40 Initialization Failed Note: For this event no information is updated in any Data map for PLC. It is notified only through Device/Configuration Tool Indicators and Message Logging	MS/Co-Proc	Error	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | N/W Module Initialization Failed	NA	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Upgrade Firmware of N/W module through FTP Option 3: Replace the Device
Database Initialization Failed		Error	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Database Initialization Failed	MS/CoProc bit = 1 Error bit = 1	# User can perform the following options: Option 1: Configuration download through utility or PLC Option 2: Replace the Device
Device Shutdown		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Device Shutdown	NA	# No Action Required
Backplane Communication Break - <Warning> Ref: Event Detection Logic – Peripheral Failure - Section 1 -Backplane Communication Break		Warning	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Backplane Communication Break	MS/CoProc bit = 1 Warning bit = 1	# User can perform the following option: Option 1: Eliminate the Noise Source
Backplane Communication Break - <Fault> Ref: Event Detection Logic – Peripheral Failure - Section 1 -Backplane Communication Break		Error	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Backplane Communication Break	MS/CoProc bit = 1 Error bit = 1	# User can perform the following options: Option 1: Eliminate the Noise Source Option 2: Power Cycle the Device Option 3: Upgrade Firmware of the Device Option 4: Replace the Device
Backplane Communication Normal Ref: Event Detection Logic – Peripheral Failure - Section 1 -Backplane Communication Break		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Backplane Communication Normal	NA	# No Action Required
Configuration Updated Note: This event occurs on any configuration change request from PCH Config Tool or through PLC		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Configuration Updated	NA	# No Action Required
Firmware Upgrade Started Note: In Application Mode this event is logged inclusive of Co-Proc Firmware Upgrade. In Boot Loader mode this event is logged excluding Co-Proc Firmware Upgrade since it is done through Boot Loader		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Firmware Upgrade Started	NA	# No Action Required
Firmware Upgrade Completed		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | --- | Firmware Upgrade Completed	NA	# No Action Required

Description	Area/ Module	Category	Event Log Message Format: Date | Time | Module | Module Position | Description	Process Input Status Bits	User Actions Note: The User Actions are displayed in the Remark column for Log screen
Firmware Upgrade Failed Note: This event is limited to failure of IO-Module, Valve, Bluetooth and B40 firmware upgrade only, Co-proc firmware upgrade is excluded from this event since it's firmware upgrade is done through Boot Loader	MS/Co-Proc	Error	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | <Module Position>| Firmware Upgrade Failed Where <Module Position> for IO Modules is indicated as 001 - Module Position. 1 002 - Module Position. 2 003 - Module Position. 3 and <Module Position> Other modules are indicated as VAL - Valve Module BLT - Bluetooth Module N/W - Network Module	NA	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Upgrade Firmware of the Device Option 3: Replace the Device
WatchDog Expired (for Count > 1 and < 5) Note: In case of Remote modules (i.e. Valve and I/Os) this event can only be logged if event notifying logic of these modules to Co-Proc is not hanged		Warning	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | <Module Position> | Watch Dog Expired Where <Module Position> for IO Modules is indicated as 001 - Module Position. 1 002 - Module Position. 2 003 – Module Position. 3 and <Module Position> Other modules are indicated as CPR- Co-Proc Module VAL - Valve Module	MS/CoProc bit = 1 Warning bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Upgrade Firmware of specified module
WatchDog Expired (for Count >= 5) Note: In case of Remote modules (i.e. Valve and I/Os) this event can only be logged if event notifying logic of these modules to Co-Proc is not hanged		Error	MM-DD-YY | HRS:MIN:SEC | MS/Co-Proc | <Module Position> | Watch Dog Expired Where <Module Position> for IO Modules is indicated as 001 - Module Position. 1 002 - Module Position. 2 003 - Module Position. 3 and <Module Position> Other modules are indicated as CPR- Co-Proc Module VAL - Valve Module	MS/CoProc bit = 1 Error bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Upgrade Firmware of specified module Option 3: Replace the Device
SPI Communication - B40 <Warning> Same as Ref: Event Detection Logic – Peripheral Failure - Section 2 - Valve - SPI Communication - Valve Driver Note: For this event no information is updated in any Data map for PLC. It is notified only through Device/Configuration Tool		Warning	MM-DD-YY | HRS:MIN:SEC | MS/Co-proc | --- | N/W Module - SPI Communication Break	NA	# User can perform the following options: Option 1: Restart the device Option 2: Upgrade Firmware of N/W through FTP Option 3: Replace the Device

Description	Area/ Module	Category	Event Log Message Format: Date | Time | Module | Module Position | Description	Process Input Status Bits	User Actions Note: The User Actions are displayed in the Remark column for Log screen
Indicators and Message Logging	MS/Co-Proc				
SPI Communication - B40 Normal		Event	MM-DD-YY | HRS:MIN:SEC | MS/Co-proc | --- | N/W Module - SPI Communication Normal	NA	# No Action Required
RTC VBAT not available Note: - Only Logging is required as per ECO 17		Warning	MM-DD-YY | HRS:MIN:SEC | MS/Co-proc | --- | RTC VBAT not available	NA	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Insert/Replace the RTC Battery Option 3: Replace the Device
Invalid Configuration from PLC Note: For this event no information is updated in any Data map for PLC. It is notified only through Device/Configuration Tool Indicators and Message Logging		Warning	MM-DD-YY | HRS:MIN:SEC | MS/Co-proc | --- | Invalid Configuration from PLC	NA	# User can perform the following option: Option 1: Set correct configuration through PLC
Auxiliary Current - Current till 12 Amps	Auxiliary Current	Event	MM-DD-YY | HRS:MIN:SEC | Auxiliary Current | --- | Normal Auxiliary Current till 12Amps	NA	# No Action Required
Auxiliary Current - Current above 12 Amps Note: - HW Cut-Off is at 12.7 Amps		Error	MM-DD-YY | HRS:MIN:SEC | Auxiliary Current | --- | High Auxiliary Current above 12Amps	Aux Current bit = 1 Error bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Replace the Device
Logic Current - Current till 7.5 Amps	Logic Current	Event	MM-DD-YY | HRS:MIN:SEC | Logic Current | --- | Normal Logic Current till 7.5Amps - [<Actual Current>Amps]	NA	# No Action Required
Logic Current - Current between 7.5 Amps to 8 Amps		Warning	MM-DD-YY | HRS:MIN:SEC | Logic Current | --- | High Logic Current between 7.5Amps to 8Amps - [<Actual Current>Amps]	Logic Current bit = 1 Warning bit = 1	# User can perform the following option: Option 1: Power Cycle the Device
Logic Current - Current above 8 Amps		Error	MM-DD-YY | HRS:MIN:SEC | Logic Current | --- | High Logic Current above 8Amps - [<Actual Current>Amps]	Logic Current bit = 1 Error bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Replace the Device
Temperature till 75 ° C	Temperature	Event	MM-DD-YY | HRS:MIN:SEC | Temperature Warning | --- | Normal Temperature till 75 °C - [<Actual Temperature>°C]	NA	# No Action Required

Description	Area/ Module	Category	Event Log Message Format: Date | Time | Module | Module Position | Description	Process Input Status Bits	User Actions Note: The User Actions are displayed in the Remark column for Log screen
Temperature between 75 °C to 80 ° C	Temperature	Warning	MM-DD-YY | HRS:MIN:SEC | Temperature Warning | --- | High Temperature between 75 °C to 80 °C - [<Actual Temperature>°C]	Temperature Warning bit = 1 Warning bit = 1	# User can perform the following options: Option 1: Eliminate the Increasing Temperature Source Option 2: Power Cycle the Device
Temperature above 80 ° C		Error	MM-DD-YY | HRS:MIN:SEC | Temperature Warning| --- | High Temperature above 80 °C - [<Actual Temperature>°C]	Temperature Warning bit = 1 Error bit = 1	# User can perform the following options: Option 1: Eliminate the Increasing Temperature Source Option 2: Power Cycle the Device Option 3: Replace the Device
Cycle Count Limit Reached	Valve	Warning	MM-DD-YY | HRS:MIN:SEC | Valve | --- | Valve <Valve No> Cycle Count Limit Reached where <Valve No> varies from 0 to 31	Target Count bit = 1 Warning bit = 1	# User can perform the following options: Option 1: Need to replace corresponding Valve and reset cycle count (Acyclic Data Map - B22.0 to B25.7) Note: The corresponding bits are set for 2 seconds
Short Circuit		Error	MM-DD-YY | HRS:MIN:SEC | Valve | --- | Valve <Valve No> in Fault State where <Valve No> varies from 0 to 31	Valve bit = 1 Error bit = 1 VF00 - VF31 bit = 1 (Valve fault status) w.r.t corresponding valve	# User can perform the following option: Option 1: Need to remove short circuit by replacing Valve
SPI Communication - Valve Driver <Warning> Ref: Event Detection Logic – Peripheral Failure - Section 2 - SPI Communication - Valve Driver		Warning	MM-DD-YY | HRS:MIN:SEC | Valve | --- | Valve Driver <Valve Driver No.> - SPI Communication Break where <Valve Driver No> varies from 1 to 4	Valve bit = 1 Warning bit = 1	# User can perform the following option: Option 1: Eliminate the Noise Source
EEPROM Corruption Ref: Event Detection Logic – Peripheral Failure - Section 3 - EEPROM Corruption		Error	MM-DD-YY | HRS:MIN:SEC | Valve | --- | EEPROM Corrupted	Valve bit = 1 Error bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Replace the Device
SPI Communication - Valve Driver <Fault> Ref: Event Detection Logic – Peripheral Failure - Section 2 - SPI Communication - Valve Driver		Error	MM-DD-YY | HRS:MIN:SEC | Valve | --- | Valve Driver <Valve Driver No.> - SPI Communication Break where <Valve Driver No> varies from 1 to 4	Valve bit = 1 Error bit = 1	# User can perform the following options: Option 1: Eliminate Noise Source Option 2: Power Cycle the Device Option 3: Replace the Device
I2C Communication - EEPROM <Fault> Ref: Event Detection Logic – Peripheral Failure - Section 4 - I2C Communication - EEPROM		Error	MM-DD-YY | HRS:MIN:SEC | Valve | --- | EEPROM - I2C Communication Break	Valve bit = 1 Error bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Replace the Device
Cycle Count Limit Reached - DI		Warning	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | < Module Position> | DI <Channel No> Cycle Count Limit Reached where <Channel No.> varies from 1 - 8	Target Count bit = 1 Warning bit = 1	# User can perform the following option: Option 1: Need to replace corresponding DI - Sensor and Reset the cycle count (Acyclic Data Map - B49.0 to B51.7) Note: The corresponding bits are set for 2 seconds

Description	Area/ Module	Category	Event Log Message Format: Date | Time | Module | Module Position | Description	Process Input Status Bits	User Actions Note: The User Actions are displayed in the Remark column for Log screen
Cycle Count Limit Reached - DO	IO/IO-Link	Warning	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position> | DO <Channel No> Cycle Count Limit Reached where <Channel No> varies from 1 to 8	Target Count bit = 1 Warning bit = 1	# User can perform the following option: Option 1: Need to replace corresponding DO - Actuator and Reset the cycle count (Acyclic Data Map - B69.0 to B71.7) Note: The corresponding bits are set for 2 seconds
Short to GND or Overload at Pin 2 and Pin 4 of M12		Error	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position> | Over Current at Channel No. <Channel No> where <Channel No> varies from 1 to 8	IO/IO-Link bit = 1 Error bit = 1 OC bit = 1 OC 1,2 or 3 bit = 1 overcurrent w.r.t corresponding I/O module	# User can perform the following option: Option 1: Need to remove short circuit and Power Cycle the Device
Resettable fuse trip (Resettable Fuse) at Pin 1 of M12 due thermal/current overload		Error	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position>| Logic Supply Overload	IO/IO-Link bit = 1 Error bit = 1	# User can perform the following option: Option 1: Need to remove short circuit
IO Module configuration and its relevant configuration in Co-Proc Mismatches		Warning	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position> | IO Configuration Mismatch	IO/IO-Link bit = 1 Warning bit = 1	# It is auto corrected by Co-Proc at Start-up by default configuration in IO Module
I2C Communication - ADC <Warning> Ref: Event Detection Logic – Peripheral Failure - Section 8 - I2C Communication - ADC		Warning	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position> | ADC - I2C Communication Break	IO/IO-Link bit = 1 Warning bit = 1	# User can perform the following option: Option 1: Eliminate the Noise Source
USART Communication - IO-Link Transceiver <Warning> Ref: Event Detection Logic – Peripheral Failure - Section 10 - I2C Communication - ADC		Warning	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position> | IO-Link Transceiver - USART <USART No> Communication Break where <USART No> varies from 1 to 4	IO/IO-Link bit = 1 Warning bit = 1	# User can perform the following option: Option 1: Eliminate the Noise Source
External Flash Corruption Ref: Event Detection Logic – Peripheral Failure - Section 5 -External Flash Corruption		Error	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position>| External Flash Corrupted	IO/IO-Link bit = 1 Error bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Replace the Device
I2C Communication - ADC <Fault> Ref: Event Detection Logic – Peripheral Failure - Section 8 - I2C Communication - ADC		Error	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position>| ADC - I2C Communication Break	IO/IO-Link bit = 1 Error bit = 1	# User can perform the following options: Option 1: Eliminate the Noise Source Option 2: Power Cycle the Device Option 3: Replace the Device
SPI Communication - IO-Link Transceiver <Fault> Ref: Event Detection Logic – Peripheral Failure - Section 9 - SPI Communication - IO-Link Transceiver		Error	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position>| IO-Link Transceiver - SPI Communication Break	IO/IO-Link bit = 1 Error bit = 1	# User can perform the following options: Option 1: Power Cycle the Device Option 2: Replace the Device

Description	Area/ Module	Category	Event Log Message Format: Date | Time | Module | Module Position | Description	Process Input Status Bits	User Actions Note: The User Actions are displayed in the Remark column for Log screen
USART Communication - IO-Link Transceiver <Fault> Ref: Event Detection Logic – Peripheral Failure - Section 10 - IO - USART Communication - IO - Link Transceiver	IO/IO-Link	Error	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position> | IO-Link Transceiver - USART <USART No> Communication Break where <USART No> varies from 1 to 4	IO/IO-Link bit = 1 Error bit = 1	# User can perform the following options: Option 1: Eliminate the Noise Source Option 2: Power Cycle the Device Option 3: Replace the Device
IO-Link - Validation Failure		Warning	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position> | IO-Link <Channel No> - Validation Failure where <Channel No> varies from 0 to 11	Refer Table 36 & 38	# User can perform the following options: Option 1: Need to replace IO-Link sensor with valid Vendor ID, Device ID and/or Serial Number Option 2: Reconfigure Port to No Validation
IO-Link - Short Circuit		Error	Note: This will be logged as part of IO-Link Events	Refer Table 36 & 38	# User can perform the following option: Option 1: Need to remove short circuit by replacing IO-Link Sensor
IO-Link - Data Storage Error		Warning	Note: This will be logged as part of IO-Link Events	Refer Table 36 & 38	# User can perform the following options: Option 1: Need to replace the IO-Link sensor with matching Device ID and Vendor ID of data storage Option 2: Reconfigure Port to Disable/ Clear Data Storage
IO-Link - Process Data Invalid		Error	MM-DD-YY | HRS:MIN:SEC | IO/IO-Link | <Module Position>| IO-Link <Channel No> - Process Data Invalid where <Channel No> varies from 0 to 11	Refer Table 36 & 38	# User can perform the following option: Option 1: Connect the IO-Link sensor
IO-Link - Device Communication Lost		Error	Note: This will be logged as part of IO-Link Events	Refer Table 36 & 38	# User can perform the following option: Option 1: Connect the IO-Link sensor
Invalid IP Address - Rotary Switch Out of Range	Network	Warning	MM-DD-YY | HRS:MIN:SEC | Network | --- | Invalid IP Address - Rotary Switch Out of Range	Network Bit = 1 Warning Bit = 1	# User can perform the following option: Option 1: Set the correct IP address by setting the Rotary Switch value within valid range
PLC - Output Access Disabled		Warning	MM-DD-YY | HRS:MIN:SEC | Network | --- | PLC - Output Access - Output Access Disabled	Network Bit = 1 Warning Bit = 1	# User can perform the following option: Option 1: Change Device Ownership since PLC is not the current owner of the device. Owner change options: 1. Exit Configure Mode of PCH Config Utility/Webserver/Bluetooth App 2. Exit Valve Testing Mode 3. Exit FTP Mode
# Master/PLC connected Online, one or more Connections established	Network - EtherNet/ IP	Event + B40	MM-DD-YY | HRS:MIN:SEC | Network | --- | Master/PLC Connected	NA	# No Action Required
# Master/PLC disconnected Online, no connections established		Event + B40	MM-DD-YY | HRS:MIN:SEC | Network | --- | Master/PLC Disconnected	NA	# User can perform the following option: Option 1: Check connection with Master/PLC and reconnect to PCH Portal if disconnected or halted
# Master/PLC disconnected One or more connections timed out		Event + B40	MM-DD-YY | HRS:MIN:SEC | Network | --- | Master/PLC Disconnected	NA	# User can perform the following option: Option 1: Debug PLC connectivity and Fix accordingly

CHAPTER - 7 **Abbreviation List**

7.1 Abbreviations

Table 52 — Abbreviation List

Acronym	Definition
ADC	Analog to Digital Converter
AP	Auxiliary Power
AUX	Auxiliary
BLE	Bluetooth Low Energy
BT	Bluetooth Module Status/Bluetooth
CH	Channel
DBT	De-bounce Time
DI	Digital Input
DID	Device ID
DIN	Digital Inversion
DIO	Digital Input Output
DIP	Dual In-line Package
DO	Digital Output
DS	Device Status
FM	Fault Mode
FRS	Resettable Fuse Status
GND	Ground
IO	Input Output
IP	Internet Protocol
IP65	Ingress Protection 65
LED	Light Emitting Diode
LOG	Logic
LP	Logic Power
MS	Module Status
NS	Network Status
OTG	On-The-Go
PCH	Parker Communication for H-Series
PLC	Programmable Logic Controller
RESV	Reserved
USB	Universal Serial Bus
VAUX	Auxiliary Voltage
VID	Vendor ID
VLOG	Logic Voltage

CHAPTER - 8 **Appendix**

8.1 Appendix A

8.1.1 IO-Link Event

IO-Link Event Qualifier: The following list of tables indicates the permissible values for various fields of Event Qualifier.

Table 53 — Permissible Values for Instances

Definition	Value
Unknown	0
Reserved	1 to 3
Application	4
Reserved	5 to 7

Table 54 — Permissible Values for Source

Definition	Value
Device (remote)	0
Master (local)	1

Table 55 — Permissible Values for Event Type

Definition	Value
Reserved	0
Notification	1
Warning	2
Error	3

Table 56 — Permissible values for mode

Definition	Value
Reserved	0
Event single shot	1
Event disappears	2
Event appears	3

8.1.2 IO-Link Event Codes

The following table lists the PCH Portal specific events. Refer to IO-Link Specification for the Events defined by IO-Link Standard. For Events generated by IO-Link Slave device, refer to the same document.

Table 57 — PCH Portal specific events

Event Code	Event Description
0xC101	Overtemperature Shutdown Level event error code
0xC102	Overtemperature Warning Level event error code
0xC103	Vdd Supply 0V event error code
0xC104	Vdd Supply UV event error code
0xC105	Vdd Supply UVLO event error code
0xC106	VL Supply UVLO event error code
0xC107	Wake-up event error code
0xC108	L+ Overcurrent Timeout event error code
0xC109	L+ Power Changed event error code
0xC10A	CQ Overcurrent Timeout event error code
0xC10B	CSense event error code
0xC201	Data Storage EEPROM access error code

8.1.3 Power Calculation for Worst case scenario

Table 58 — Power Calculations

Module Config	Logic Power			Auxiliary Power				
	Theoretical Max Module Power Draw	Power Available for PCH Network Portal	Power Available for Pass Through	Theoretical Max Module Power Draw	Power Available after Module Draw	Valve Power Draw	Power Available for PCH Network Portal	Power Available for Pass Through
	Logic (A)	Logic (A)	Logic (A)	Aux (A)	Aux (A)	Aux (A)	Aux (A)	Aux (A)
AAA	8.000	0.000	12.000	4.256	7.744			
AAB	6.000	2.000	14.000	9.056	2.944			
AAC	7.500	0.500	12.500	8.656	3.344			
AAN	6.000	2.000	14.000	4.256	7.744			
ABB	4.000	4.000	16.000	12.000	0.000			
ABC	6.000	2.000	14.000	12.000	0.000			
ABN	5.000	3.000	15.000	9.056	2.944			
ACC	7.000	1.000	13.000	12.000	0.000			
ACN	5.500	2.500	14.500	8.656	3.344			
BBB	5.000	3.000	15.000	12.000	0.000			
BBC	3.500	4.500	16.500	12.000	0.000			
BBN	2.000	6.000	18.000	12.000	0.000			
BCC	4.000	4.000	16.000	12.000	0.000			
BCN	2.500	5.500	17.500	12.000	0.000			
CCC	4.500	3.500	15.500	12.000	0.000			
CCN	3.000	5.000	17.000	12.000	0.000			

NOTE: “To obtain ‘Power Available for PCH Network Portal’, subtract ‘Valve Power Draw’ from ‘Power Available after Module Draw’. To obtain ‘Power Available for Pass Through’, subtract 20 A by ‘Power Available for PCH Network Portal’”

8.1.4 Ordering information

The part number written on the label for the PCH Network Portal can be understood using the below model number structure. **IMPORTANT**: This part number **cannot** be purchased from the factory. To purchase a PCH Network Portal, refer to the published catalog of the PCH Network Portal for the full end plate kit part number. This can be found at the product landing page:
https://ph.parker.com/us/17571/en/pch-network-portal/pch-portal

For any questions, please contact pdnapps@parker.com.

Network Communication	
E	Ethernet/IP
T	EtherCAT
N	PROFINET
A	PROFINET AIDA
M	Modbus TCP

I/O Module position 1	
A	IO Link A or Configurable IO
B	IO Link B or Configurable IO
C	IO Link B + Aux Output

I/O Module position 2	
A	IO Link A or Configurable IO
B	IO Link B or Configurable IO
C	IO Link B + Aux Output

I/O Module Position 3	
A	IO Link A or Configurable IO
B	IO Link B or Configurable IO
C	IO Link B + Aux Output
N	Blanking Plate

Power Connectors	
P4	4 pin power in/out with 1 Safe Power Capable zone
P5	5 pin power in/out with 1 Safe Power Capable zone
S4	4 pin power in/in with 2 Safe Power Zones
S5	5 pin power in/in with 2 Safe Power Zones
J1	Aida Power in/out with 1 Safe Power Capable zone

8.1.5 Connectivity and Integration Support

Network Connectivity Site
https://promo.parker.com/promotionsite/network-connectivity/us/en/home

Network Connectivity – Resource Library
http://solutions.parker.com/PDN_NetworkConnectivityResourceLibrary

Network Connectivity – Software Files
http://solutions.parker.com/PDN_softwarefiles

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