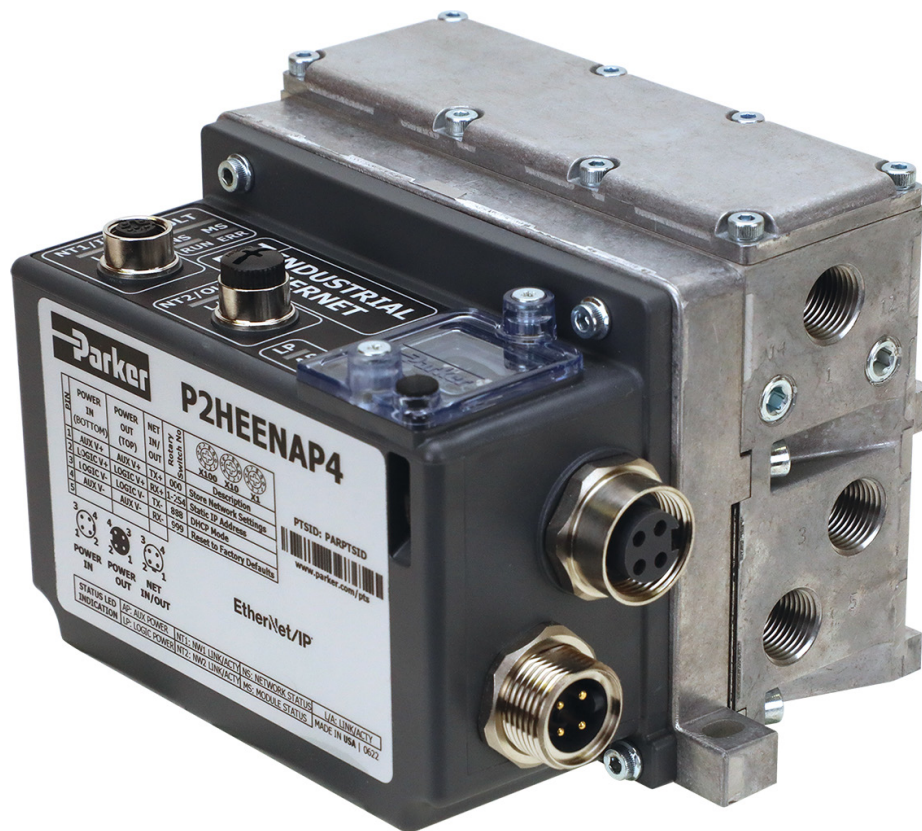




Pneumatic Division North America
Richland, Michigan 49083

VAL-SIF-161
Title: P2H Ethernet Node 32 DO
Modbus User Manual
ISSUED: April, 2022

P2H Ethernet Node 32 DO USER MANUAL



Trademark Information

MODBUS® is a registered trademark of Schneider Electric USA, Inc.

Intended Use

The P2H Node 32DO must be only used as follows:

- As intended for industrial environments and conditions as compliant with the regulatory agencies of the region.
- In the original status 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 limit values that are specified for pressure, temperature, electrical data, torques, etc. must be observed.

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.

Service Information

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



Important!

Before carrying out any service work, ensure that the valve and manifold have been vented. Remove the primary supply air hose to ensure total disconnection of the air supply before dismantling valves or blank connection blocks.



NB!

All technical data in this catalogue is typical only.

The air quality is decisive for the valve life: see ISO 8573.



WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice. © Copyright 2016, 2013 Parker Hannifin Corporation. All Rights Reserved

SALE CONDITIONS

The items described in this document are available for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. Any sale contract entered into by Parker will be governed by the provisions stated in Parker's standard terms and conditions of sale (copy available upon request).

Important User Information

Please read and follow all safety information for the P2H Node 32DO, including the warning and caution statements in this guide, before installing or operating the system.

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

The user, through their own analysis and testing, are 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 and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Safety Information

**WARNING:**

The P2H Node 32DO 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 P2H Node 32DO are not intended for any use in systems, machines, or applications where failure or fault of any kind 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. High Risk Use is STRICTLY PROHIBITED.

**WARNING:**

The P2H Node 32DO 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 damages.

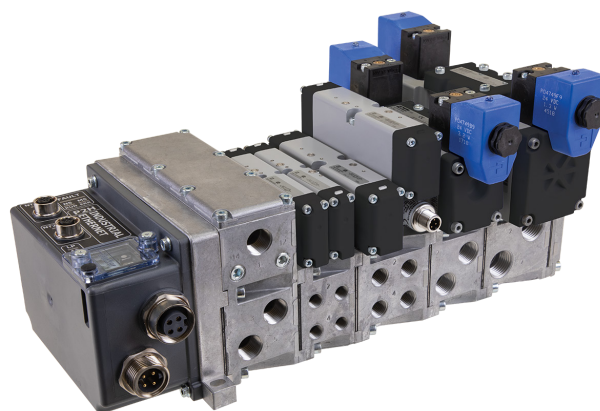
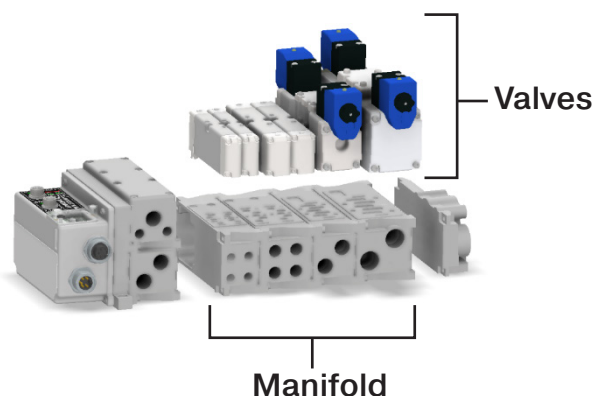
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Product General Overview

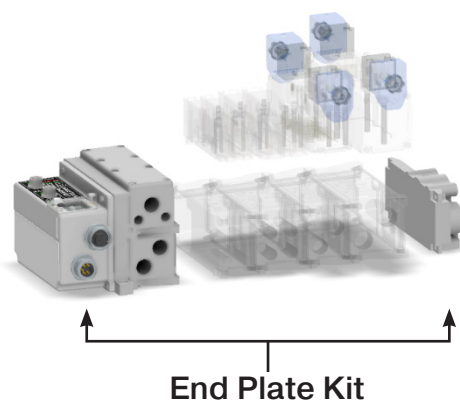
The P2H Node 32DO has been designed to be connected to a Modbus-TCP Network. It can be used with Parker's H-Universal ISO 15407-2 (size 02 & 01) and 5599-2 (sizes 1, 2 & 3) valve series. It can control up to 32 pilot solenoid addresses with different power configuration options available and provides local visual and remote diagnostics through the Network. Designed for industrial environments, the P2H Node 32DO is constructed of PBT material, which is glass-filled and offers weld splatter resistance, UV stability and has significant flame-retardant properties making it suitable for the durability required in industrial applications with high heat and welding applications.



H ISO 15407-2 & 5599-2 Valves

With H Universal Manifold

Up to 32 coils



**M12 Communication
Ports**

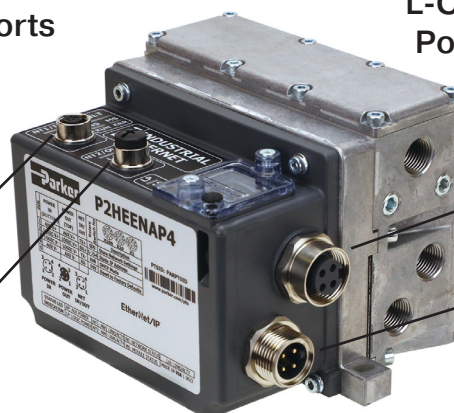
**7/8"
or
L-Coded M12
Power Ports**

Comm. In

Comm. Out

Power Out

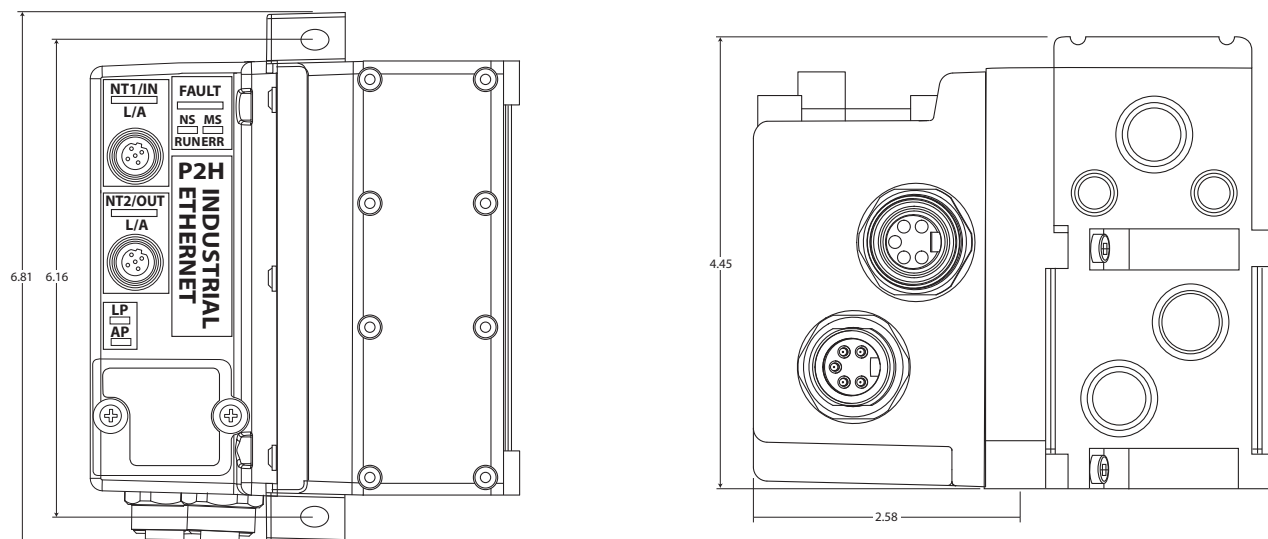
Power In



**P2H Node 32DO
Communication Module**

P2H Node 32DO Technical Specifications

Mechanical Dimensions

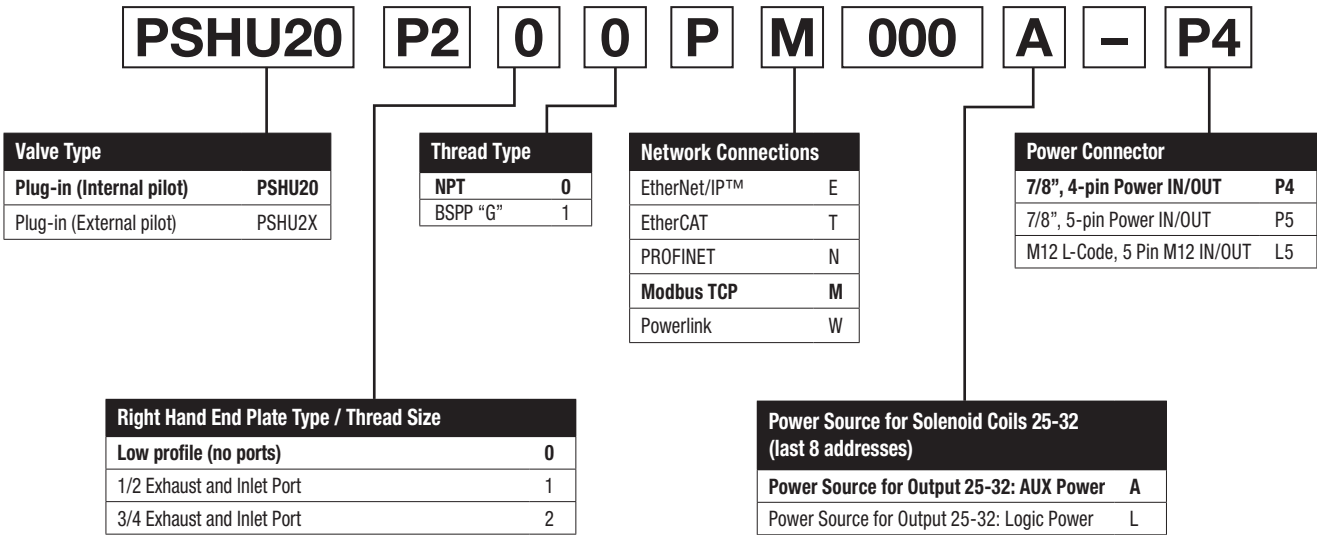


Parameters	Details
Housing material	Housing /Enclosure: PBT with 33% GF and UL94-V0 Base Cover (plate): Aluminium 380
Enclosure rating	IP65 (only when plugged-in and threaded-in)
Supply Voltage	7/8" 4 pin or 7/8" 5 pin or L-Coded M12 5-pin male and female pin connector
Input ports/ Output ports	N/A
Dimensions (L x B x H in mm)	226.6mm x 130.7mm x 55mm
Mounting type	Screw Mount
Ground strap attachment	M5
Weight	Approx. 1.3 kg

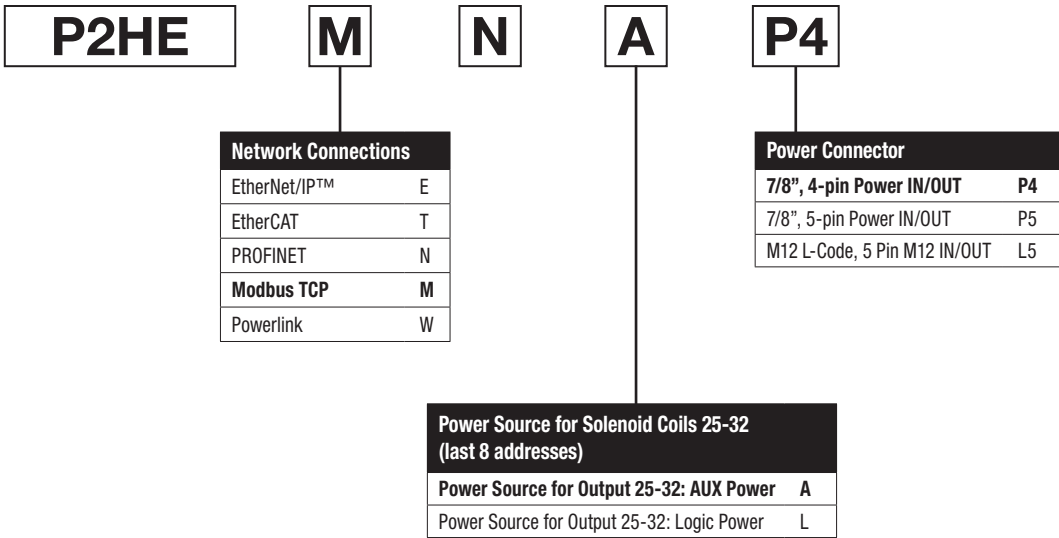
Description	Value
Network power supply	24 Vdc +/- 10%
Speed communication	According to Modbus TCP standard
Auxiliary power supply Voltage	20.4 Vdc to 26.4 Vdc
Current limit per channel	150 mA
Max. current limit	5.2 A
Polarity inversion protection	YES
Short circuit protection	YES
Operating temperature	0°C to +55°C
Storage temperature	-25°C to +70°C
Shock	According to IEC 60068-2-27:2008
Vibration	According to IEC 60068-2-6:2007
EMC	According to EN 55011 & EN 61000-4-2 up to -4-6

Part Numbering

The P2H Node 32DO is ordered as a full endplate part number detailed below:



NOTE: The part number on the label of unit cannot be ordered on its own; however, it can be used to determine the network module characteristics



Part Numbering continued

Note: An optional intermediate air supply module must be installed to the manifold for expansion from 24 to 32 solenoid addresses.

PSHU115A

E

1


P

Mounting Style / Port Size	
Intermediate Air Supply, NPT / Internal Pilot	PSHU115A
Intermediate Air Supply, BSPP / Internal Pilot	PSHU115B*
Intermediate Air Supply, NPT / External Pilot	PSHU115C
Intermediate Air Supply, BSPP / External Pilot	PSHU115D*

* BSPP conforms to ISO 1179-1 w 228-1 threads.

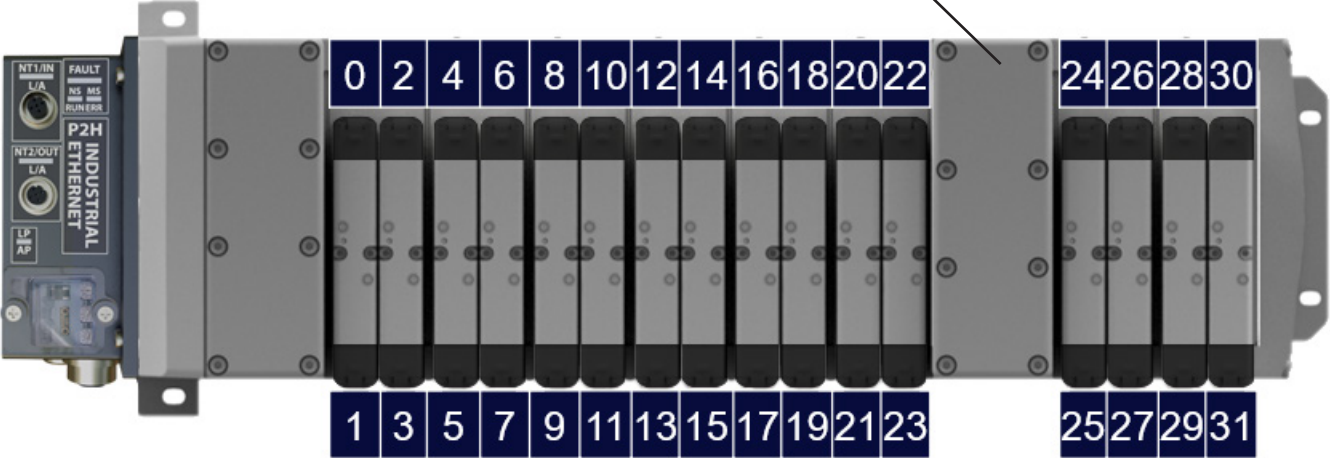
Gasket Options	
1	1,3,5 Ports Open And Pilots Open
2	1,3,5 Ports Closed And Pilots Open
3	1 Closed, 3,5 Ports Open And Pilots Open
4	1 Port Open, 3,5 Ports Closed And Pilots Open
5	1,3,5 Ports Open And Pilots Closed
6	1,3,5 Ports Closed And Pilots Closed
7	1 Closed, 3,5 Ports Open And Pilots Closed
8	1 Port Open, 3,5 Ports Closed And Pilots Closed

Circuit Board Address Configuration	
E	With Electrical Expansion To 25th Address



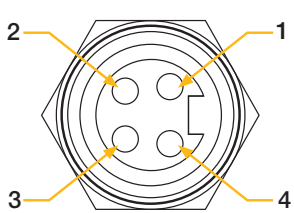
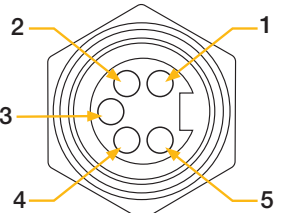
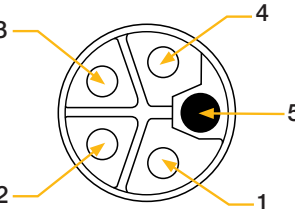
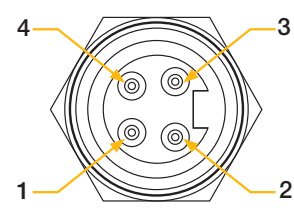
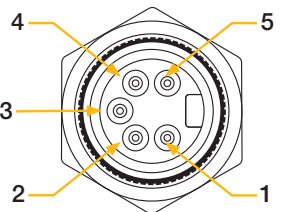
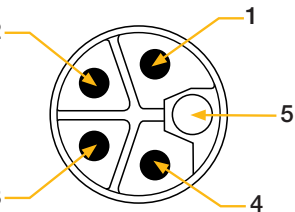
Intermediate air supply module shown

Address Numbers



Power Supply

The following three types of power connectors are available based on the end user's requirement. Current considerations should be used in the power connection selection process. Each power connection type can support a maximum of 12 A of current on each channel (VAUX and VLOG). When power daisy chain is used, care must be taken in knowing the downstream current draw in order not to overload the maximum current rating of the pins.

TOP CONNECTOR	P4 - 7/8", 4-pin			P5 - 7/8", 5-pin			L5 - L-Coded, M12		
	Power OUT			Power OUT			Power OUT		
									
	Pin	Function	Description	Pin	Function	Description	Pin	Function	Description
	1	+ 24 V	V2 (VAUX)	1	0 V	GND V2 (VAUX)	1	+ 24 V	V1 (VLOG)
	2	+ 24 V	V1 (VLOG)	2	0 V	GND V1 (VLOG)	2	0 V	GND V2 (VAUX)
BOTTOM CONNECTOR	3	0 V	GND V1 (VLOG)	3	PE	Protective Earth	3	0 V	GND V1 (VLOG)
	4	0 V	GND V2 (VAUX)	4	+ 24 V	V1 (VLOG)	4	+ 24 V	V2 (VAUX)
				5	+ 24 V	V2 (VAUX)	5	PE	Protective Earth
	Power IN			Power IN			Power IN		
									
	Pin	Function	Description	Pin	Function	Description	Pin	Function	Description
	1	+ 24 V	V2 (VAUX)	1	0 V	GND V2 (VAUX)	1	+ 24 V	V1 (VLOG)
	2	+ 24 V	V1 (VLOG)	2	0 V	GND V1 (VLOG)	2	0 V	GND V2 (VAUX)
	3	0 V	GND V1 (VLOG)	3	PE	Protective Earth	3	0 V	GND V1 (VLOG)
	4	0 V	GND V2 (VAUX)	4	+ 24 V	V1 (VLOG)	4	+ 24 V	V2 (VAUX)
				5	+ 24 V	V2 (VAUX)	5	PE	Protective Earth

*PE – Protective Earth

Auxiliary Power Consumption Calculation

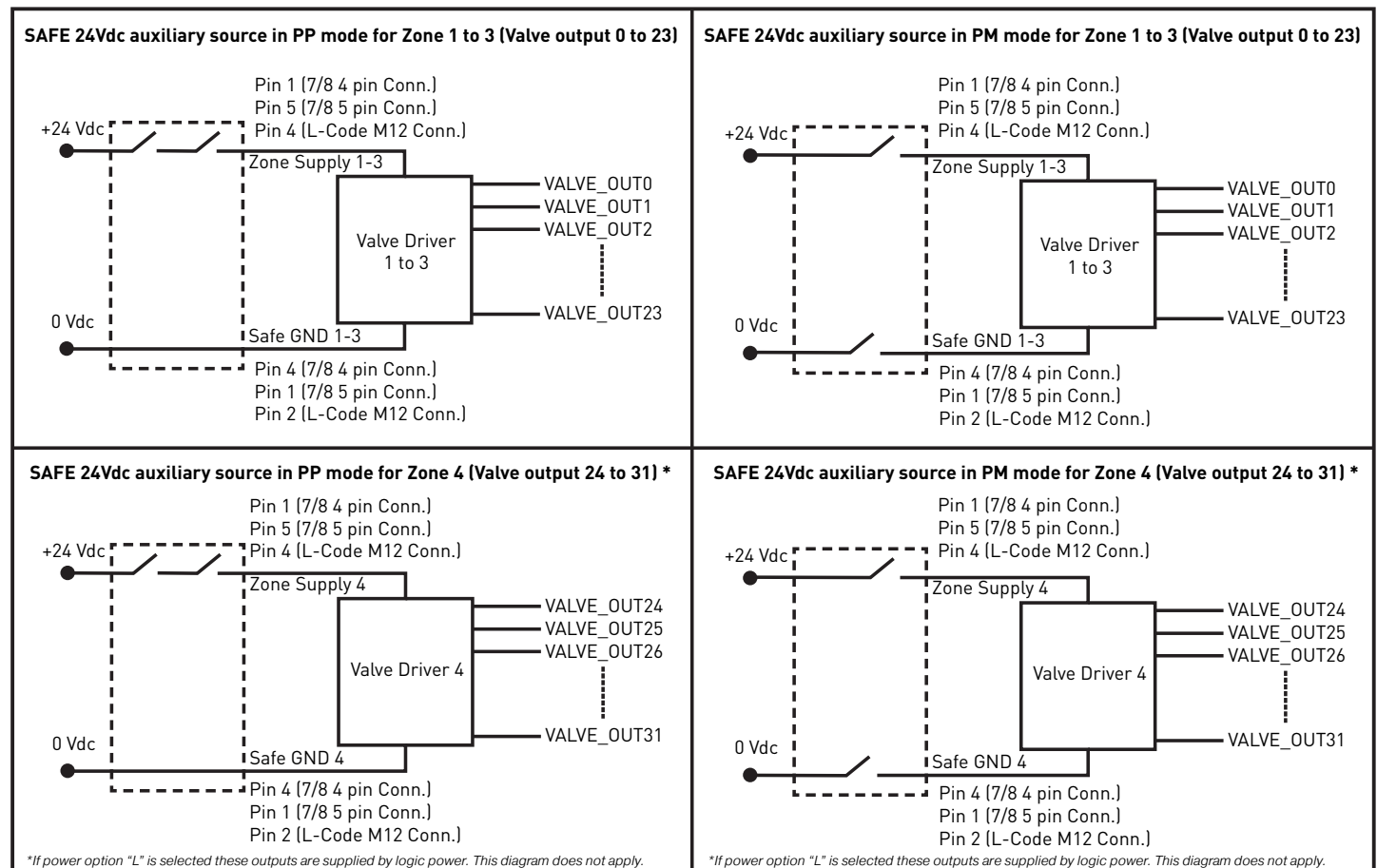
The P2H Node 32DO auxiliary power consumption calculation depends on the combination of the valves selected and the number of coils used. The table below can be used for power consumption calculation by valve type and the number of each type used. Take note that there are two types of coils for sizes 1,2,3. An energy efficient coil and standard coil.

Valve Range	Number of Pilots Simultaneously powered	Power	Total
H ISO - 15407-2 - Sizes 02 & 01	_____	x 40 mA	= _____ mA
H ISO - 5599 - Sizes 1, 2 & 3 (Energy Efficiency Coils)	_____	x 54 mA	= _____ mA
H ISO - 5599-2 - Sizes 1, 2 & 3 (Standard Coils)	_____	x 133 mA	= _____ mA
Total :			_____ mA

Safe Power Supply

P2H Node 32DO connected to SAFE power supply for Auxiliary Power

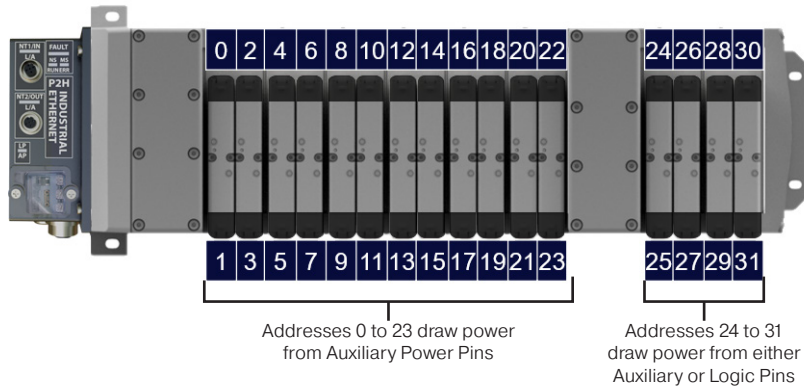
The P2H Node 32DO Auxiliary Power for valves can be supplied from a SAFE 24 VDC auxiliary source in PP (plus plus) or PM (plus minus) mode, as well as from Output Switching Signals Device Failsafe Digital Outputs (OSSD FDO). The connection diagram is below.



Note: Please check max. power available from the source. Refer to the [“Auxiliary power consumption calculation”](#) section.

Power Selection

The P2H Node 32DO has two available power sources for coils 24 to 31. Addresses 24 to 31 can draw their power from Auxiliary Power Pins (Model Code Option A) or Logic Power Pins (Model Code Option L)



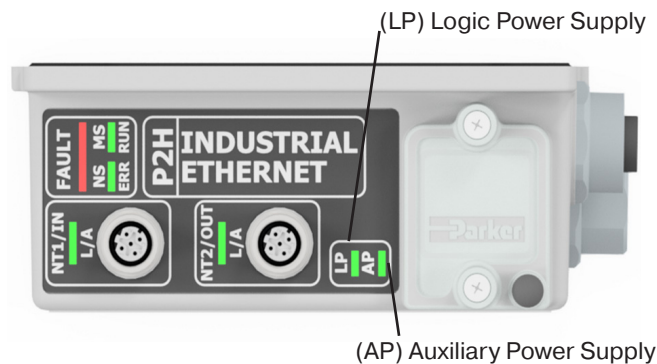
PSHU*****	A	***
Power Source for Solenoid Coils 25-32 (last 8 addresses)		
Power Source for Output 24-31: AUX Power	A	
Power Source for Output 24-31: Logic Power	L	

Power Supply Diagnostics

Power Supply Diagnostics through LED

The P2H Node 32DO monitors the logic and auxiliary power supply voltages and manages two levels of diagnostics: warning and error range. Status is indicated via LEDs located on the device. The range limits can be modified through parameter data.

To restore default value (factory setting), refer to “[Factory Reset](#)” section.



LP and AP (Green / Yellow) LEDs		
LED Status	Description	Troubleshooting
OFF	Logic and/or Aux lines not powered	Check power supply (see Power Supply section for pin assignments)
ON (Green)	Voltage in normal range	N/A
ON (Red)	Voltage in error range (too low or too high)	Check power supply (see Power Supply section for pin assignments)
Blinking (Red)	Voltage in warning range (out of normal range, not in error range)	Check power supply (see Power Supply section for pin assignments)
Blinking (Red / Green)	Reset to factory operation complete	N/A
Blinking (Yellow)	Invalid rotary switch setting	Check rotary switch setting
Blinking (Red / Yellow)	Firmware version error or Completed “Reset to Factory” procedure	If switches setting different from “999” and no “Reset to Factory” performed via webpage, then contact technical support

LED function details:

- “Logic/Aux power” error is active from 9 to 18 Vdc or above 28.5 Vdc
- When “Logic/Aux power error” is active, LED is solid red

Power Supply Diagnostics through Network and Process Data Mapping

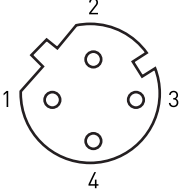
Diagnostics are available in Process data Input (“Module Input Error”) to indicate whether Logic and Auxiliary voltages are within range. There is a warning range (normal operation with fault indication) and an error range (module enters Failsafe state).

The default warning range is set as 20.0 VDC < power supply < 26.4 VDC. These limits can be modified via parameters registers “AUX and Logic Voltage Warning Low Limits”, “AUX and Logic Voltage Warning High Limits”. The error range is set as 18 VDC < power supply < 28.5 VDC. These limits cannot be modified.

The voltage measured by the module, both Logic and Auxiliary, can be accessed via status register “Auxiliary and logic voltage”. The displayed value is in mV.

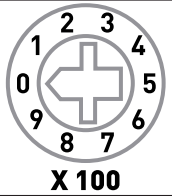
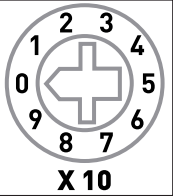
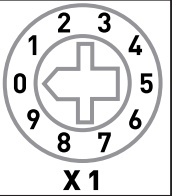
Network Interface

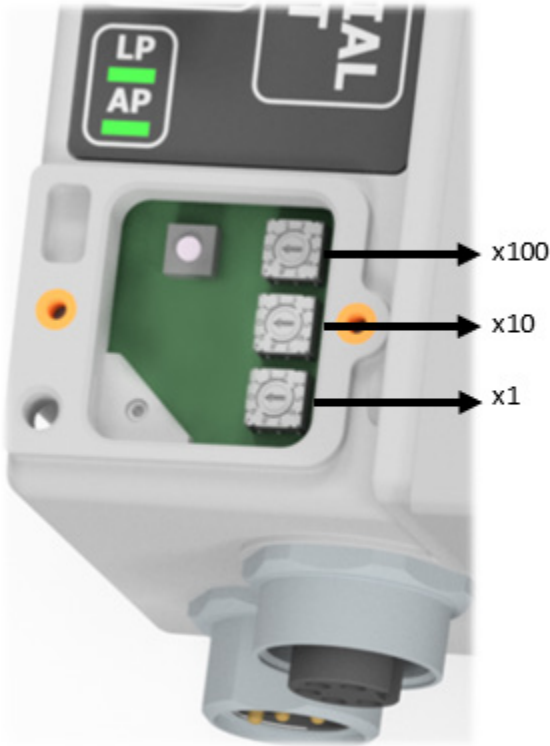
The P2H Node 32DO allows connection to the Modbus-TCP network via two M-12 D-Coded connector (NT1 and NT2). Using these connectors, daisy chained ethernet communications is possible. The connector pin assignment is as follows:

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

IP-Address Setting

The Rotary switches are housed below the cover. The rotary switches are used to configure the P2H Node 32DO for the following functionalities based on the rotary switch settings shown in following table.

ADDRESS			
	X 100	X 10	X 1



IP Switch Setting	Description
000	Used to store configured IP address suite to the P2H Node 32DO internal memory. If using DHCP/BOOTP, HMS Config Tool, or web interface to set IP Address then IP address should be stored to memory, or it will revert to default IP range below.
001 – 254	IP-Address setting is determined by the 3 rotary switches: <ul style="list-style-type: none">• IP Address: 192.168.1.xxx• Subnet Mask: 255.255.255.0• Default Gateway for 001: 192.168.1.2• Default Gateway for 002 - 254: 192.168.1.1
888	The device obtains its address via DHCP or BootP
999	Reset to Factory Status. Resets the following: web-login, cycle counters, warning levels, output state behaviors
All others	Invalid. The Module will not start (see Local Visual Diagnostic section for details)

Reset to Factory Status

“Reset to Factory” mode restores all the parameters, counters, password and configurations to their default values. “Reset to Factory” mode can be accessed in one of two ways: either via a button on the “Parameter” tab of the embedded web page, or via rotary switch setting “999”. Once the reset is completed and all the values are restored to default values, the module signals the completed operation by quickly flashing red/green the “Logic Status” LED. If a “Reset to Factory” is performed, a valid IP-address must be set using one of the methods stated in this manual, and a power cycle is required to resume normal operations.

P2H Node 32 DO Configuration Files

The configuration files and integration tools are available for download from the [Parker Network Connectivity Site \(click here\)](#).



Parker Network
Connectivity Site



Parker Valve
Catalog



Parker FRL
Catalog

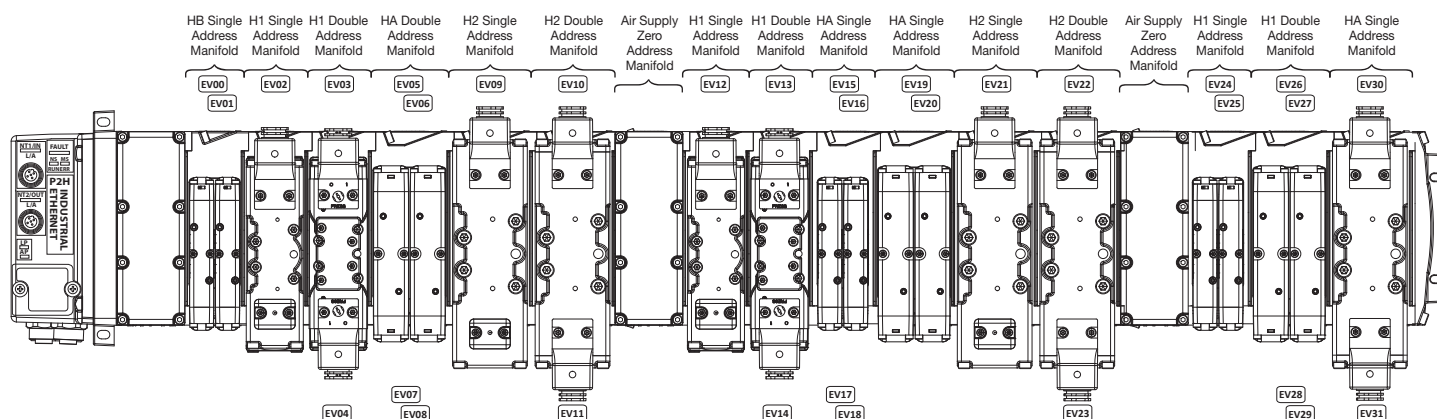


Parker Actuator
Catalog

Solenoid Pilots Addressing

The P2H Node 32DO used with H ISO Series – 15407-2 – sizes 02 & 01 and 5599-2 – sizes 1, 2 & 3 – can handle up to 32 pilot solenoid valves. Addressing is as shown below (on H Universal manifold).

For PLC addressing see [Process Data Mapping](#) | [Output Data](#).



Local Visual Diagnostic LEDs

The P2H Node 32DO module offers local diagnostics through 7 LED's status described in the table below:

NT1/IN & NT2/OUT (Green / Yellow)		
LED Status	Description	Troubleshooting
OFF	Not link, no activity	Check connection to the Network
ON (Green)	Link 100Mbit/s established	N/A
FLASHING (Green)	Ongoing activity 100Mbit/s	N/A
ON (Yellow)	Link 10Mbit/s established	N/A
FLASHING (Yellow)	Ongoing activity 10 Mbit/s	N/A

LP Logic Power (Green / Yellow)		
LED Status	Description	Troubleshooting
OFF	Logic lines not powered	Check power supply (e.g., pin's 2 & 3 on 7/8" 4 pin)
ON (Green)	LOGIC voltage in normal range	N/A
ON (Red)	LOGIC voltage in error range (way too high or way too low)	Check power supply (e.g., pin's 2 & 3 on 7/8" 4 pin)
BLINKING (Red)	Logic voltage in warning range (out of normal range)	Check power supply (e.g., pin's 2 & 3 on 7/8" 4 pin)
BLINKING (Red & Green)	Resetting to factory complete	N/A
BLINKING (Yellow)	Invalid rotary switch setting	Check rotary switch setting
BLINKING (Red & Yellow)	Firmware version error or Completed "Reset to Factory"	If switches setting different from "999" and no "Reset to Factory" performed via webpage, then contact technical support

AP Aux Power (Green / Yellow)		
LED Status	Description	Troubleshooting
OFF	Aux lines not powered	Check power supply (e.g., pin's 1 & 4 on 7/8" 4 pin)
ON (Green)	AUX Voltage in normal range	N/A
ON (Red)	Aux Voltage in error range (too low or too high)	Check power supply (e.g., pin's 1 & 4 on 7/8" 4 pin)
BLINKING (Red)	AUX voltage in warning range (out of normal range, not in error range)	Check power supply (e.g., pin's 1 & 4 on 7/8" 4 pin)
BLINKING (Red & Green)	Resetting to factory complete	N/A
BLINKING (Yellow)	Invalid rotary switch setting	Check rotary switch setting
BLINKING (Red & Yellow)	Firmware version error or Completed "Reset to Factory"	If switches setting different from "999" and no "Reset to Factory" performed via webpage, then contact technical support



LED's Status "OFF" refers to a LED unilluminated

LED's Status "ON" refers to a LED illuminated uninterruptedly

The term "Blinking" means LED turning on/off every 500ms

The term "Flashing" means LED turning on/off irregularly or unpredictably

Fault (Red / Yellow)		
LED Status	Description	Troubleshooting
OFF	No Fault	
ON (Red)	Presence of any fault requiring acknowledgment	N/A
FLASHING (Red)	Recoverable error.	Remove fault condition. If problem persists consult the factory
BLINKING (Red)	Output Drivers error, typically a short-wired output channel.	Reference "Channel Error" definition for details
BLINKING (Yellow)	Invalid rotary switch setting	Check rotary switch setting
BLINKING (Red & Yellow)	Firmware version error or Completed "Reset to Factory"	If switches setting different from "999" and no "Reset to Factory" performed via webpage, then contact technical support

NS (Red / Green)		
LED Status	Description	Troubleshooting
OFF	Module offline (no IP address) or not powered	Check power supply and connection to the Network. Check IP address setting
ON (Green)	At Least one Modbus message received	N/A
BLINKING (Green)	Waiting for first Modbus message	Check Module configuration into engineering environment
ON (Red)	IP address conflict detected. The module will not start	Check IP-Addresses onto the network and look for duplicates.
BLINKING (Red)	Connection timeout. No Modbus message has been received within the configured "process active time out" time	Check connection to the network. Restart the module

MS (Red / Green)		
LED Status	Description	Troubleshooting
OFF	No Power or Module in SETUP	Check power supply. If power OK, await few seconds. If problem persists, change the module
ON (Green)	Normal operations	N/A
ON (Red)	Exception or fatal Error	Power cycle module. Change module if error persists
BLINKING (Red)	Minor Fault	Check Diagnostic Log
BLINKING (Red & Green)	Firmware update in progress. DO NOT POWER DOWN THE MODULE	Await the completion of the update then restart the module

Supported Modbus Function- and Exception

Function Codes

#	Function	Description
1	Read Coils	Read single/multiple process output bits
2	Read Discrete Inputs	Read single/multiple process input bits
3	Read Holding Registers	Read single/multiple holding registers
4	Read Input Register	Read process input register
5	Write Single Coil	Write single process output bit
6	Write Single Register	Write single holding register
15	Write Multiple Coils	Write multiple process output bits
16	Write Multiple Register	Write multiple holding registers
23	Read/Write Multiple Register	Read and write multiple holding registers
43/14	Read Device Identification	Read device identification details

Exception Codes

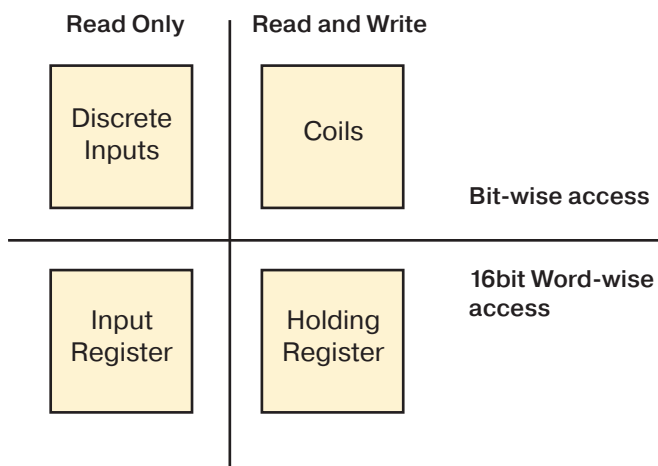
Code	Name	Description
0x01	Illegal Function	The function code in the query is not supported
0x02	Illegal Data Address	The data address received in the query is outside the initialized memory area
0x03	Illegal Data Value	The data in the request is illegal

Modbus TCP Connections

An established Modbus-TCP connection will be closed after 60 seconds, if idle.

Modbus Register Implementation

Modbus organizes its data in four register tables: Discrete Inputs (1x), Input Registers (3x), Coils (0x), Holding Registers (4x). The tables vary in read/write access permissions and data-width as illustrated in the picture below. (See appendix for full information on register Implementation)



Process Data Outputs Registers

The process output data is accessible in more than one register tables and/ or at multiple register locations, the registers are dedicated to solenoid status and system commands.

Registers Table	Address	Byte	Type	Description
Coils (0x) <i>-Bit-wise access</i> <i>-Read/Write</i>	0x0000 to 0x0007	-	-	System Commands, bits 0...7
	0x0008 to 0x0027	-	-	Solenoids
Holding Registers (4x) <i>-16-bit word access</i> <i>-Read/Write</i>	0x0000	-	UINT8	System Commands
		0	UINT8[4]	Solenoids
	0x0001	1..2		
	0x0002	3		
		Reserved		
	0x1010 to 0x1011	0..3	UINT8[4]	Solenoids
	0x11D0	-	UINT8	System Commands
		Reserved		

“System Commands”

The “System Command Byte” is used for specific functions, such as “Store switching cycles” and others detailed in the table below. In order to execute the desired function, the specific value associated with the command has to be written to the register.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT8	1	Read / Write	System Command	0	0xFF	0

The System Command Byte supports the commands as defined in this table.

Command Value	Command Name	Description
0X02	Store Switching Cycle Counters	When this command is executed, the current values of the switching cycle counters are stored into EEPROM. This command is intended to be used before powering off the device.
0X03	Store Diagnostic Log	When this command is executed, the diagnostic log is stored to the EEPROM.
0X04	Delete Diagnostic Log	Removes all diagnostic log entries in EEPROM (required by webpage).

“Solenoids”

The “System Command Byte” is used for specific functions, such as “Store switching cycles” and others detailed in the table below. In order to execute the desired function, the specific value associated with the command has to be written to the register.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT8	4	Read / Write	OUT Data	0x00000000	0xFFFFFFFF	0x00000000

The 32 solenoids are represented by one bit each, where the LSB (Least Significant Bit) is associated with EV00 and the MSB (Most Significant Bit) is associated with EV31.

Example of Output Process Data usage:

Byte	4				3	2	1			
Bit #	31 (MSB)	30	29	2	1	0 (LSB)
Example Output Data	1	0	1	0	1	0
Controlled Output	Out_31 HIGH	Out_30 LOW	Out_29 HIGH	Out_2 LOW	Out_1 HIGH	Out_0 LOW
Solenoid (EV) Energized	EV31 ON	EV30 OFF	EV29 ON	EV02 OFF	EV01 ON	EV00 OFF

Process Data Inputs Registers

The process input data is accessible in more than one register tables and/ or at multiple register locations, the registers are dedicated to the P2H status/diagnostic's info.

Registers Table	Address	Byte	Type	Description
Discrete Inputs (1x) - Bit-wise access - Read only	0x0000 to 0x0007	-	-	Module Error Input
	0x0010 to 0x002F	-	-	Channel Error
	0x0030 to 0x0038	-	-	Module Info's Flags
Input Registers (3x) - 16-bit word access - Read only	0x0000	0..1	UINT16	Module Error Input
	0x0001 to 0x0002	0..3	UINT8[4]	Channel Error
	0x0003	0..1	UINT16	Module Info's Flags
Holding Registers (4x) - 16-bit word access - Read	0x0800	0..1	UINT16	Module Error Input
	0x0801 to 0x0802	0..3	UINT8[4]	Channel Error
	0x0803	0..1	UINT16	Module Info's Flags
	0x1150 to 0x1151	0..3	UINT8[4]	Channel Error
	0x1190	0..1	UINT16	Module Info Flags
	0x1210	0..1	UINT16	Module Error Input

“Module Error Input”

This register contains user-friendly diagnostics (in case of errors or faults) provided as Process Data Input.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT16	1	Read	Module Error Input	0	0xFFFF	0

Bit #	Error Name	Error Description
Diag 0	AUX Voltage Warning	Set if Auxiliary Voltage in warning range. Module keeps normal operation
Diag 1	AUX Voltage Error	Auxiliary Voltage in Error range. Outputs are switched OFF
Diag 2	Logic Voltage Warning	Set if Logic voltage is out of range for warning.
Diag 3	Logic Voltage Error	Set if Logic voltage is out of range for error. Outputs are switched OFF
Diag 4	Temperature Warning	Set if a temperature increase above warning levels is detected by the output drivers
Diag 5	Output Driver Channel Error	Set if a major fault is detected at the output stage – solenoid short circuit. Outputs are switched OFF
Diag 6	Module Error	Set if an internal communication error is active
Diag 7	Auxiliary Power Not Available	Auxiliary Power is off
Diag 8-15	Diag 8-15	These bits will be always set as 0

“Channel Error”

In case an error occurs in the outputs stage (e.g.: short circuit or over-temperature), these registers provide information about which channel caused the error. The bits corresponding to the outputs that caused the fault are set to 1 in Object register.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT8	4	Read	Channel Error	0x000000	0xFFFFFFFF	0x000000

Field	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Channel Error	Solenoid 8	Solenoid 7	Solenoid 6	Solenoid 5	Solenoid 4	Solenoid 3	Solenoid 2	Solenoid 1
	Solenoid 16	Solenoid 15	Solenoid 14	Solenoid 13	Solenoid 12	Solenoid 11	Solenoid 10	Solenoid 9
	Solenoid 24	Solenoid 23	Solenoid 22	Solenoid 21	Solenoid 20	Solenoid 19	Solenoid 18	Solenoid 17
	Solenoid 32	Solenoid 31	Solenoid 30	Solenoid 29	Solenoid 28	Solenoid 27	Solenoid 26	Solenoid 25

“Module Info Flags”

This register contains information about possible module states and faults / errors that might affect the module. If possible, the device will try to recover from these errors. If recovery is not possible, the device may need to be replaced. The message headers and flag definitions associated with each bit in the register are detailed in the table (see next page). For further details, consult factory.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT16	1	Read	Module Info Flags	0	0xFFFF	0

Bit #	Error Name	Error Description
Diag 0	Heartbeat not toggling AUX 1	Heartbeat is currently not toggling
Diag 1	Heartbeat not toggling AUX 2	
Diag 2	SPI COM Error AUX 1	Error in SPI Communication between AUX and Logic. Outputs are switched off
Diag 3	SPI COM Error AUX 2	
Diag 4	SPI COM Lost AUX 1	Communication not possible. Outputs are switched off
Diag 5	SPI COM Lost AUX 2	
Diag 6	Output Interconnect Error	Short circuit between outputs detected. Affected outputs switched off.
Diag 7	Comm Module Error (SPI_NP40_ERROR)	Error in communication between Logic and Comm
Diag 8	Comm Module Version Error (NP40_Version_Error)	Comm Module Version error. Outputs are switched off
Diag 9-15	Reserved	These bits will be always set as 0

Status/Diagnostics Data and Parameter Registers

Registers Table	Address	Byte	Type	Description
Holding Registers (4x) - 16-bit word access - Read/Write	0x1003	0..1	UINT16	Process Active Timeout
	0x1004	0..1	UINT16	Enter/Exit Idle Mode
	0x1050 to 0x108F	0..127	UINT32[32]	Switching Cycles Counter, Solenoid
	0x1090 to 0x1091	0..3	UINT8[4]	Clear Switching Cycles, Solenoid
	0x10D0	0..1	UINT16[2]	Auxiliary and logic voltage
	0x10D1	0..1		
	0x1290	0..1	UINT16[2]	Voltage Warning Low Limits
	0x1291	0..1		
	0x12D0	0..1	UINT16[2]	Voltage Warning High Limits
	0x12D1	0..1		
	0x1310		UINT8	Output State Behavior
		Reserved		
	0x1350 to 0x1351	0..3	UINT8[4]	Open Load Detection, Solenoid
	0x1390 to 0x1391	0..3	UINT32[4]	Firmware Versions
	0x1392 to 0x1393	0..3		
	0x1394 to 0x1395	0..3		
	0x1396 to 0x1397	0..3		
	0x1410 to 0x1413		UINT8[7]	Led State
	0x1490 to 0x1491	0..3	UINT32	System Time
	0x14D0 to 0x14D1	0..3	UINT32	System Time PLC
	0x1510 to 0x1511	0..3	UINT32	System Time Web
	0x1550 to 0x1551	0..3	UINT8[4]	Inter-Output Short Circuits, Solenoids

Address: 0x1003 - Process Active Timeout

This register value defines the settings for the Process active timeout in milliseconds. It specifies how long the module shall stay in the 'PROCESS_ACTIVE' state after receiving a Modbus-TCP request. Changes will have immediate effect. This setting is disabled by default (value 0).

Address: 0x1004 - Enter/Exit Idle Mode

With help of this register, the IDLE state can be entered/exited. The value 0 is interpreted as "Not Idle" any other value as "Idle".

Address: 0x1050 to 0x108F - Switching Cycles Counter, Solenoid

These registers contain the 32 switching cycle counters for the valves. The counter values are automatically stored by the module every 5 minutes.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
Array of UINT32	32	Read	Switching Cycle Counters	0	*	0

* Max value for this data is circa 4.3 billion (UINT32 max representable value). Once that the max value is reached, this is held in memory and additional cycles are not counted.

Address: 0x1090 to 0x1091 - Clear Switching Cycles, Solenoid

These registers allow the switching cycle counter for the solenoids to be reset to zero. The counter for each solenoid can be reset individually by setting the associated bit on the register – i.e.: for each bit set to 1 in the register, the associated counter is set to zero.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
Array of UINT8	4	Read */ Write	Clear Switching Cycle Counters	0	0xFF 0xFF 0xFF 0xFF	0

* The Read service for this Object always returns all zeros.

Address: 0x10D0 - Auxiliary and logic voltage

These registers contain the measured value of the Aux and Logic Voltage. Aux and Logic must be read simultaneously.

Data Type	N° of Elements	Access	Name			Min Value	Max Value	Default
Array of UINT32	32	Read	Switching Cycle Counters	0	AUX	0	36300	24000
				1	Logic			

Address: 0x1290 & 0x1291 - AUX and Logic Voltage Warning Low Limits

These registers contain the values for the AUX and Logic Voltage Warning Low Limit – i.e.: the (low) AUX Voltage value (shown in mV) that will trigger the AUX Voltage Warning diagnostic. Both Aux and Logic must be read/written simultaneously.

Data Type	N° of Elements	Access	Name			Min Value	Max Value	Default
Array of UINT16	2	Read/Write	AUX and Logic Voltage Warning Low Limit	0	AUX	19400	24000	20400
				1	Logic			

Address: 0x12D0 & 0x12D1 - AUX and Logic Voltage Warning High Limits

These registers contain the values for the AUX and Logic Voltage Warning High Limit, in millivolts – i.e.: the (high) Logic Voltage value that will trigger the Logic Voltage Warning diagnostic. Both Aux and Logic must be read/written simultaneously.

Data Type	N° of Elements	Access	Name			Min Value	Max Value	Default
Array of UINT16	2	Read/Write	AUX and Logic Voltage Warning Low Limit	0	AUX	24000	28500	26400
				1	Logic			

Address: 0x1310 - Output State Behavior

This register applies in case of communication lost (between Controller and P2H Node 32DO) and determines output behavior in case of loss of communication, as follows:

Register Value = 0→Outputs are set to “0”.

Register Value = 1→Outputs are held to last valid state.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT8	1	Read/Write	Output State Behavior	0	1	0

Address: 0x1350 to 0x1351 - Open Load Detection, Solenoid

These registers apply in case an open load or missing coil is detected on an Output during startup, the specific bit is set. The module checks all outputs once during startup for missing coils. If no load is detected on an output, the specific bit in this bitmap is set. Open load is not considered as an error.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
Array of UINT8	4	Read	Open Load Detection	0x00	0xFF	0x00

Address: 0x1390 to 0x1391, 0x1392 to 0x1393, 0x1394 to 0x1395 & 0x1396 to 0x1397 - Firmware Versions

Registers provides the major firmware versions of various microcontrollers on the module. For additional info consult the factory.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
Array of UINT32	4	Read	FW Versions	See table below		

Array Item	Bit 31..24 (MSB)	Bit 23..16	Bit 15..8	Bit 7..0 (LSB)
0	AUX1 FW Major	AUX1 FW Minor	(not used)	(not used)
1	AUX2 FW Major	AUX2 FW Minor		
2	Logic FW Major	Logic FW Minor		
3	Comm Module FW Major	Comm Module FW Minor	Comm Module FW Build	

Address: 0x1410 to 0x1413 - Led State

These registers contain the status of the LEDs on the unit.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
Array of UINT8	7	Read	LED States	See below		

Array Item	LED
0	AP
1	LP
2	Fault
3	NS/RUN
4	MS/ERROR
5	Link1
6	Link2

For the webpage to show the current state of the P2H Node 32DO module's LEDs, information about the "Logic Power", "AUX Power" and "Fault" LED, as well as the comm-module LEDs are made accessible via these Registers. These registers is an array with one entry for each LED. The table to the right shows the encoding of the LED colors and blinking patterns. The blinking frequency is 1 Hz.

Value	Meaning
0	State Unknown
1	OFF
2	Solid Green
3	Blinking Green
4	Solid Red
5	Blinking Red
6	Solid Yellow
7	Blinking Yellow
8	Blinking Red/Yellow

Run/Idle Status

This register and the P2H Node 32DO webpage do not allow the user to write settings or parameters during an active PLC connection. This Object offers the required information for this task to the webpage.

- "Idle" signals there is currently no PLC connection. This also includes pre-operational or error states.
- "Running" signals that there is at least one ongoing PLC connection. User cannot make changes to process data or other parameters via webpage.

Data Type	N° of Elements	Access	Name	Value(s)
Array of UINT8	1	Read	Run/Idle Status	0: Idle 1: Running

Address: 0x1490 to 0x1491 - System Time

These registers contain the system time. System time format is compliant to the Unix Timestamp. The time is only used to timestamp the entries of the Diagnostic event log (see Diagnostic Log Registers). The System Time can be set in the following manner:

- System Time can be explicitly written to Address 0x14D0 to 0x14D1 via the PLC. This value will then be automatically transferred to Address 0x1490 to 0x1491.
- In case time setting is unavailable in Address 0x14D0 to 0x14D1, System Time will be automatically transferred from Address 0x1510 to 0x1511.
- In the unlikely event that time settings aren't available in Address 0x14D0 to 0x14D1 or Address 0x1510 to 0x1511, the System Time will be set to a standard recovery value January 1st, 2020, 12:00 am

Data Type	N° of Elements	Access	Name	Value(s)
UINT32	1	Read	System Time	Unix Time in seconds since 1970-01-01, 12:00 am

Address: 0x14D0 to 0x14D1 - System Time PLC

Index 0x14D0 to 0x14D1 allows system time to be set explicitly via the PLC. Value should be Unix Time in seconds since 1970-01-01, 12:00 am.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT32	1	Read/Write	System Time PLC	0	4,294,967,295	-

Address: 0x1510 to 0x1511 - System Time Web

The register can write the system time to the P2H Node 32DO to be in sync with web browser's time. Index 0x1510 to 0x1511 is updated automatically when device is accessed via embedded web page. This value will be transferred to Index 0x1490 to 0x1491 if no value is available in Index 0x14D0 to 0x14D1. Value should be Unix Time in seconds since 1970-01-01, 12:00 am.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT32	1	Read/Write	System Time Web	0	4,294,967,295	-

Address: 0x1550 to 0x1551 - Inter-Output Short Circuits, Solenoids

These registers detect inter-output short circuits at the factory. Value should always be zero. If not, consult factory.

Data Type	N° of Elements	Access	Name	Min Value	Max Value	Default
UINT8	4	Read	Inter-Output Short Circuits	0	0xFF	-

Diagnostics Log

Registers Table	Address	Byte	Type	Contents	Description
Holding Registers (4x) - 16-bit word access - Read/Write	0x1750 to 0x1751	0..3	UINT32	Timestamp	Diagnostic Log#1
	0x1752	0..1	UINT16	Event-ID	
	0x1753 to 0x1754	0..3	UINT32	Additional Event Data	
	0x1790 to 0x1794	Identical to diagnostic Log#1 register			Diagnostic Log#2
	0x17D0 to 0x17D4	Identical to diagnostic Log#1 register			Diagnostic Log#3
	0x1810 to 0x1814	Identical to diagnostic Log#1 register			Diagnostic Log#4
	0x1850 to 0x1854	Identical to diagnostic Log#1 register			Diagnostic Log#5
	0x1890 to 0x1894	Identical to diagnostic Log#1 register			Diagnostic Log#6
	0x18D0 to 0x18D4	Identical to diagnostic Log#1 register			Diagnostic Log#7
	0x1910 to 0x1914	Identical to diagnostic Log#1 register			Diagnostic Log#8
	0x1950 to 0x1954	Identical to diagnostic Log#1 register			Diagnostic Log#9
	0x1990 to 0x1994	Identical to diagnostic Log#1 register			Diagnostic Log#10
	0x19D0 to 0x19D4	Identical to diagnostic Log#1 register			Diagnostic Log#11
	0x1A10 to 0x1A14	Identical to diagnostic Log#1 register			Diagnostic Log#12
	0x1A50 to 0x1A54	Identical to diagnostic Log#1 register			Diagnostic Log#13
	0x1A90 to 0x1A94	Identical to diagnostic Log#1 register			Diagnostic Log#14
	0x1AD0 to 0x1AD4	Identical to diagnostic Log#1 register			Diagnostic Log#15
	0x1B10 to 0x1B14	Identical to diagnostic Log#1 register			Diagnostic Log#16
	0x1B50 to 0x1B54	Identical to diagnostic Log#1 register			Diagnostic Log#17
	0x1B90 to 0x1B94	Identical to diagnostic Log#1 register			Diagnostic Log#18
	0x1BD0 to 0x1BD4	Identical to diagnostic Log#1 register			Diagnostic Log#19
	0x1C10 to 0x1C14	Identical to diagnostic Log#1 register			Diagnostic Log#20
	0x1C50 to 0x1C54	Identical to diagnostic Log#1 register			Diagnostic Log#21
	0x1C90 to 0x1C94	Identical to diagnostic Log#1 register			Diagnostic Log#22
	0x1CD0 to 0x1CD4	Identical to diagnostic Log#1 register			Diagnostic Log#23
	0x1D10 to 0x1D14	Identical to diagnostic Log#1 register			Diagnostic Log#24
	0x1D50 to 0x1D54	Identical to diagnostic Log#1 register			Diagnostic Log#25
	0x1D90 to 0x1D94	Identical to diagnostic Log#1 register			Diagnostic Log#26
	0x1DD0 to 0x1DD4	Identical to diagnostic Log#1 register			Diagnostic Log#27
	0x1E10 to 0x1E14	Identical to diagnostic Log#1 register			Diagnostic Log#28
	0x1E50 to 0x1E54	Identical to diagnostic Log#1 register			Diagnostic Log#29
	0x1E90 to 0x1E94	Identical to diagnostic Log#1 register			Diagnostic Log#30
	0x1ED0 to 0x1ED4	Identical to diagnostic Log#1 register			Diagnostic Log#31
	0x1F10 to 0x1F14	Identical to diagnostic Log#1 register			Diagnostic Log#32
	0x1F50 to 0x1F54	Identical to diagnostic Log#1 register			Diagnostic Log#33
	0x1F90 to 0x1F94	Identical to diagnostic Log#1 register			Diagnostic Log#34
	0x1FD0 to 0x1FD4	Identical to diagnostic Log#1 register			Diagnostic Log#35
	0x2010 to 0x2014	Identical to diagnostic Log#1 register			Diagnostic Log#36
	0x2050 to 0x2054	Identical to diagnostic Log#1 register			Diagnostic Log#37

Registers Table	Address	Byte	Type	Contents	Description
Holding Registers (4x) -16-bit word access -Read/Write	0x2090 to 2091	0..3	UINT32	Timestamp	Diagnostic Log#38
	0x2092	0..1	UINT16	Event-ID	
	0x2093 to 0x2094	0..3	UINT32	Additional Event Data	
	0x20D0 to 0x20D4	Identical to diagnostic Log#38 register			Diagnostic Log#39
	0x2110 to 0x2114	Identical to diagnostic Log#38 register			Diagnostic Log#40

The diagnostic log populates a set of 40 Objects with a similar structure. This way, it is easier for the user to request and interpret specific logging entries. The entries are sorted in the order of occurrence, Object Diagnostic Log# 1 being the most recent entry and Diagnostic Log#40 the oldest. The information contained in the Diagnostic Log includes errors as defined in the "Module Info Flags" and "Module Error Input" Objects.

Data Type	N° of Elements	Access	Name	Value(s)
Structure (see below table)	3 Structure items	Read	Diagnostic Log	(not applicable)

The webpage offers an export function for the user to save the log as a CSV file. As the log only has 40 entries, the oldest entries are overwritten with new ones if the log is full (First In, First Out). The Diagnostic Log is non-volatile and is stored in the host's EEPROM every 30 minutes or by user interaction (see Object System Commands). The following table lists all implemented Event IDs. The errors range from 0000h to 3FFFh. The warnings range from 4000h to 7FFFh. The notifications range from 8000h to FFFFh. Complementary events (appearing/disappearing) differ by offset 1000h.

Register Diagnostic Log#1 to Diagnostic Log#40 – Diagnostic Log Event IDs

Event ID (hex)	Meaning	Additional Event Data
Errors		
0001	Driver channel error / Short-circuit state detected	Channel Error
1001	Driver channel error / Short-circuit state removed	Channel Error
0002	Inter-Output short-circuit detected	Inter-Output Short Circuits
1002	Inter-Output short-circuit removed	Inter-Output Short Circuits
0003	AUX voltage entered low error range	AUX Voltage in mV
1003	AUX voltage left low error range	AUX Voltage in mV
0004	AUX voltage entered high error range	AUX Voltage in mV
1004	AUX voltage left high error range	AUX Voltage in mV
0005	LOGIC voltage entered low error range	LOGIC Voltage in mV
1005	LOGIC voltage left low error range	LOGIC Voltage in mV
0006	LOGIC voltage entered high error range	LOGIC Voltage in mV
1006	LOGIC voltage left high error range	LOGIC Voltage in mV
0007	AUX power not available	-
1007	AUX power available again	-
0008	Module Error occurred or changed	Module Error Input
0009	Comm Module occurred	-
1008	All Module Errors resolved	Module Error Input
Warnings		
4000	AUX voltage entered low warning range	AUX Voltage in mV
5000	AUX voltage left low warning range	AUX Voltage in mV
4001	AUX voltage entered high warning range	AUX Voltage in mV
5001	AUX voltage entered high warning range	AUX Voltage in mV
4002	LOGIC voltage entered low warning range	LOGIC Voltage in mV
5002	LOGIC voltage left low warning range	LOGIC Voltage in mV
4003	LOGIC voltage entered high warning range	LOGIC Voltage in mV
5003	LOGIC voltage left high warning range	LOGIC Voltage in mV
4004	Temperature Warning on Output Drivers detected	0 = AUX1; 1 = AUX2
5004	Temperature Warning on Output Drivers removed	0 = AUX1; 1 = AUX2
4005	Open Load detected	Open Load Detection
Notifications		
8000	P2H Node 32DO startup in normal mode	-
8001	P2H Node 32DO startup in Self-Test Mode	-
8002	P2H Node 32DO restarted by watchdog	-
8003	System Time change by PLC	System Time PLC
8004	System Time change by Webpage	System Time Web
8005	Diagnostic Log deleted	-
8006	Diagnostic Log stored manually	-
8007	Switching Cycles counter(s) cleared	Clear Switching Cycles
8008	Switching Cycles counters stored	-
800A	Low Voltage warning level changed	Voltage Warning Low Limits; bit16..31: Logic, bit0..15: AUX
800B	High Voltage warning level changed	Voltage Warning High Limits; bit16..31: Logic, bit0..15: AUX
800C	Output State Behavior changed	Output State Behavior
800E	P2H Node 32DO parameters reset to factory defaults. Or: EEPROM was corrupted. This event is executed at next startup.	-
8FFF	Corrupt Log entry (EEPROM load error)	-

Web Server

Overview Page

IDENTIFICATION

Module name	P2H Node 32DO EtherNet/IP
Serial number	A0456D3C
FW versions	AUX1: 0.04 AUX2: 0.04 Logic: 0.05 NP40: 1.41.02 Web: 0.05
Uptime	0 days, 1h:46m:56s
CPU Load	7 %
Module Time	01/01/2020 01:50:13

CURRENT IP SETTINGS

DHCP	Disabled
Host Name	
IP Address	192.168.1.123
Subnet Mask	255.255.255.0
Gateway Address	192.168.1.1
DNS Server #1	0.0.0.0
DNS Server #2	0.0.0.0
Domain Name	

CURRENT ETHERNET STATUS

MAC Address	00:30:11:00:00:10
Port 1	No Link
Port 2	100 FDX
PLC Connection State	Idle

LED NAME MEANING

LED	NAME	MEANING
<input type="radio"/>	FAULT	No Active Faults / Active Fault/s
<input checked="" type="radio"/>	NS (Network Status)	No Config / Connected / No Data Exchange / Time Out
<input checked="" type="radio"/>	MS (Module Status)	N/A / Status OK / Config Error / Fault
<input checked="" type="radio"/>	LP (Logical Power)	Missing LP / Nominal Range / Warning Range / Error Range
<input checked="" type="radio"/>	AP (Auxiliary Power)	Missing AP / Nominal Range / Warning Range / Error Range
<input checked="" type="radio"/>	NT L/A (Network Link Activity)	No L/A Link / Link, NO Traffic / Link Activity / N/A

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Change Password


It is possible to modify the password via a dedicated button on the top right corner of all the tabs of the web server. The web server will require the user to enter the current password before entering the new value for the field. The password can be restored to default values (PARKER) with a "Reset to Factory". The default username is "PARKER".

Default Password (Case Sensitive)	
Username	PARKER
Password	PARKER

The Web-server has five tabs:

- **OVERVIEW:** Main product information is available via this page
- **STATUS/CONFIG:** Objects (Read and Write) are accessible via this page
- **NT STATUS:** Information about current network status is available via this page
- **LOG:** The module's errors, warnings, and events are displayed and capable of export here
- **HELP:** A short version of the user manual is available in PDF form at this tab


Status/Config Page



English P2H IE - EtherNet/IP(TM)

OVERVIEW STATUS/CONFIG NT STATUS LOG HELP

CHANGE PASSWORD



Address	Tags	Status	# Cycles	Fault	Address	Tags	Status	# Cycles	Fault
0	Valve 1	Off (0)	1373	N/A	16	Valve 17	Off (0)	2064	N/A
1	Valve 2	Off (0)	2088	N/A	17	Valve 18	Off (0)	2060	N/A
2	Valve 3	Off (0)	2086	N/A	18	Valve 19	Off (0)	2063	N/A
3	Valve 4	Off (0)	2077	N/A	19	Valve 20	Off (0)	2063	N/A
4	Valve 5	Off (0)	2076	N/A	20	Valve 21	Off (0)	2061	N/A
5	Valve 6	Off (0)	7903	N/A	21	Valve 22	Off (0)	2058	N/A
6	Valve 7	Off (0)	2071	N/A	22	Valve 23	Off (0)	2062	N/A
7	Valve 8	Off (0)	2068	N/A	23	Valve 24	Off (0)	2058	N/A
8	Valve 9	Off (0)	2067	N/A	24	Valve 25	Off (0)	2109	N/A
9	Valve 10	Off (0)	2058	N/A	25	Valve 26	Off (0)	2096	N/A
10	Valve 11	Off (0)	2059	N/A	26	Valve 27	Off (0)	2094	N/A
11	Valve 12	Off (0)	2056	N/A	27	Valve 28	Off (0)	2094	N/A
12	Valve 13	Off (0)	2058	N/A	28	Valve 29	Off (0)	2094	N/A
13	Valve 14	Off (0)	2060	N/A	29	Valve 30	Off (0)	2090	N/A
14	Valve 15	Off (0)	2056	N/A	30	Valve 31	Off (0)	2098	N/A
15	Valve 16	Off (0)	2060	N/A	31	Valve 32	Off (0)	1370	N/A

POWER SUPPLY

Logic Domain	Auxiliary Domain
Voltage (V) 23.893	Voltage (V) 23.659
Voltage Warning Level (V)	Voltage Warning Level (V)
low: 20,4 SET	low: 20,4 SET
high: 26,402 SET	high: 26,401 SET

DIAGNOSTIC - MODULE ERROR INPUT

#	Description	Value
0	AUX Voltage Warning	0
1	AUX Voltage Error	0
2	Logic Voltage Warning	0
3	Logic Voltage Error	0
4	Temperature Warning	0
5	Output Driver Channel Error	0
6	Module Error	0
7	AUX power not available	0

COMMANDS

Solenoids Cycles Counters

CLEAR ALL COUNTERS

STORE COUNTERS

System Command

RESET TO FACTORY DEFAULT

Output state at loss of communication

Set outputs to 0

SET

IP CONFIGURATION

DHCP	Disabled	Host Name	
IP Address	192.168.1.123	Domain name	
Subnet Mask	255.255.255.0	DNS Server #1	0.0.0.0
Gateway Address	192.168.1.1	DNS Server #2	0.0.0.0

SAVE SETTINGS

ETHERNET CONFIGURATION


Port 1	Auto
Port 2	Auto


SAVE SETTINGS

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NT Status Page



English
P2H IE - Ethernet Modbus-TCP


OVERVIEW STATUS/CONFIG **NT STATUS** LOG HELP
CHANGE PASSWORD

CURRENT IP CONFIGURATION

DHCP:	Disabled
IP Address:	192.168.1.123
Subnet Mask:	255.255.255.0
Gateway Address:	0.0.0.0
Host Name:	
Domain Name:	
DNS Server #1:	0.0.0.0
DNS Server #2:	0.0.0.0

CURRENT ETHERNET STATUS

MAC Address:	00:05:94:02:A6:F3
Port 1:	100 FDX
Port 2:	No Link

Interface Counter

	PORT 1	PORT 2	INTERNAL
In Octets:	87394	0	66518
In Ucast Packets:	241	0	239
In NUCast Packets:	185	0	108
In Discards:	0	0	0
In Errors:	0	0	0
In Unknown Protos:	0	0	4
Out Octets:	331680	0	330862
Out Ucast Packets:	339	0	335
Out NUCast Packets:	16	0	16
Out Discards:	0	0	0
Out Errors:	0	0	0

Media Counter

	PORT 1	PORT 2
Alignment Errors:	0	0
FCS Errors:	0	0
Single Collisions:	0	0
Multiple Collisions:	0	0
Late Collisions:	0	0
Excessive Collisions:	0	0
SQE Test Errors:	0	0
Deferred Transmissions:	0	0
MAC Receive Errors:	0	0
MAC Transmit Errors:	0	0
Carrier Sense Errors:	0	0
Frame Size Too Long:	0	0

Modbus Statistics

Modbus Connections:	0
Connection ACKs:	0
Connection NACKs:	0
Connection Timeouts:	0
Process Active Timeouts:	0
Processed messages:	0
Incorrect messages:	0

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Log

A rolling list of errors, warnings, and events is available. This list can be exported to CSV.

English P2H IE - EtherNet/IP(TM)

OVERVIEW STATUS/CONFIG NT STATUS **LOG** HELP

CHANGE PASSWORD

DIAGNOSTIC LOGS

Date	Time	Type	Description	Event	Extra Data	Remarks
01/01/2020	00:00:00	warning	Open Load detected (bitfield ADI14 in extra data, bit0 = Solenoid 1 etc...)	4005	ffffffff	none
01/01/2020	00:00:00	event	AUX2 event	8020	00070000	none
01/01/2020	00:00:00	event	AUX1 event	8010	00070000	none
01/01/2020	00:00:00	event	P2H startup in normal mode	8000	00000000	none
01/01/2020	00:28:53	event	Diagnostic Log deleted (via ADI8)	8005	00000000	none

REFRESH CLEAR LOGS EXPORT TO CSV

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Help

A short version of the user manual is available in PDF form at this tab

Pneumatic Division North America
Richland, Michigan 49083

VAL-SIF-165
Title: P2H Ethernet Node 32 DO
Embedded User Manual
ISSUED: April, 2022

P2H Ethernet Node 32 DO
P2HU**P2HE**PE00N**P*
USER MANUAL

Embedded
Help Manual

OVERVIEW STATUS/CONFIG NT STATUS LOG **HELP**

DOWNLOAD MANUAL

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Appendix: Module Register Mapping

Holding Register(4x): The 16-bit word registers of this table are read/write accessible.

Address	Type	Byte	Name
0x0000	UINT8		System Commands
0x0001	UINT8[4]	0	Solenoids (Bit 0 to 7)
		1	Solenoids (Bit 8 to 15)
		2	Solenoids (Bit 16 to 23)
		3	Solenoids (Bit 24 to 31)
0x0002	Reserved		
0x0003 ... 0x07FF			
0x0800	UINT16	0	Module Error Input (Bit 0 to 7)
		1	Module Error Input (Bit 8 to 15)
0x0801	UINT8[4]	0	Channel Error (Bit 0 to 7)
		1	Channel Error (Bit 8 to 15)
		2	Channel Error (Bit 16 to 23)
		3	Channel Error (Bit 24 to 31)
0x0802			
0x0803	UINT16	0	Module Info Flags (Bit 0 to 7)
		1	Module Info Flags (Bit 8 to 15)
0x0804 ... 1002	Reserved		
0x1010	UINT8[4]	0	Solenoids (Bit 0 to 7)
		1	Solenoids (Bit 8 to 15)
		2	Solenoids (Bit 16 to 23)
		3	Solenoids (Bit 24 to 31)
0x1011			
0x1012 ... 0x104F	Reserved		
0x1050	UINT32[32]	0	Switching Cycles (Solenoid 1, Bit 0 to 7)
		1	Switching Cycles (Solenoid 1, Bit 8 to 15)
0x1051		2	Switching Cycles (Solenoid 1, Bit 16 to 23)
		3	Switching Cycles (Solenoid 1, Bit 24 to 31)
0x1052		4	Switching Cycles (Solenoid 2, Bit 0 to 7)
		5	Switching Cycles (Solenoid 2, Bit 8 to 15)
0x1053		6	Switching Cycles (Solenoid 2, Bit 16 to 23)
		7	Switching Cycles (Solenoid 2, Bit 24 to 31)
0x1054 ... 0x108F		8 ... 127	Switching Cycles (Solenoid 3, Bit 0 to 7) ... Switching Cycles (Solenoid 32, Bit 24 to 31)
0x1090		0	Clear Switching Cycles (Output 0 to 7)
		1	Clear Switching Cycles (Output 8 to 15)
0x1091		2	Clear Switching Cycles (Output 16 to 23)
		3	Clear Switching Cycles (Output 24 to 31)
0x1092 ... 0x10CF	Reserved		
0x10D0	UINT16[2]	0	AUX and Logic Voltage (LSB)
		1	AUX and Logic Voltage (MSB)
0x10D1		0	AUX and Logic Voltage (LSB)
		1	AUX and Logic Voltage (MSB)
0x10D2 ... 0X114F	Reserved		

Address	Type	Byte	Name
0x1150	UINT8[4]	0	Channel Error (Output 0 to 7)
		1	Channel Error (Output 8 to 15)
0x1151		2	Channel Error (Output 16 to 23)
		3	Channel Error (Output 24 to 31)
0x1152 ... 0x118F	Reserved		
0x1190	UINT16	0	Module Info Flags (Bit 0 to 7)
		1	Module Info Flags (Bit 8 to 15)
0x1191 ... 0x11CF	Reserved		
0x11D0	UINT8		System Commands
0x11D1 ... 0x120F	Reserved		
0x1210	UINT16	0	Module Error Input (Bit 0 to 7)
		1	Module Error Input (Bit 8 to 15)
0x1211 ... 0x128F	Reserved		
0x1290	UINT16[2]	0	Voltage Warning Low Limits (LSB)
		1	Voltage Warning Low Limits (MSB)
0x1291		0	Voltage Warning Low Limits (LSB)
		1	Voltage Warning Low Limits (MSB)
0x1292 ... 0x12CF	Reserved		
0x12D0	UINT16[2]	0	Voltage Warning High Limits (LSB)
		1	Voltage Warning High Limits (MSB)
0x12D1		0	Voltage Warning High Limits (LSB)
		1	Voltage Warning High Limits (MSB)
0x1292 ... 0x130F	Reserved		
0x1310	UINT8		Output State Behavior
	Reserved		
0x1311 ... 0x134F	Reserved		
0x1350	UINT8[4]	0	Open Load Detection (Output 0 to 7)
		1	Open Load Detection (Output 8 to 15)
0x1351		2	Open Load Detection (Output 16 to 23)
		3	Open Load Detection (Output 24 to 31)
0x1352 ... 0x138F	Reserved		
0x1390	UINT32	0	AUX1 Firmware Versions - Major
		1	AUX1 Firmware Versions - Minor
0x1391		2	AUX1 Firmware Versions - Reserved byte 1
		3	AUX1 Firmware Versions - Reserved byte 2
0x1392 ... 0x1393	AUX2 Firmware Versions (identical to AUX1 Firmware Versions)		
0x1394 ... 0x1395	Logic Firmware Versions (identical to AUX1 Firmware Versions)		
0x1396 ... 0x1397	Comm Module Firmware Versions (identical to AUX1 Firmware Versions)		
0x1398 ... 0x140F	Reserved		
0x1410	UINT8		LED State, AUX Power LED
	UINT8		LED State, Logic Power LED
0x1412	UINT8		LED State, Module State LED
	UINT8		LED State, Link/Activity LED1

Address	Type	Byte	Name
0x1412	UINT8		LED State, Module State LED
	UINT8		LED State, Link/Activity LED1
0x1413	UINT8		LED State, Link/Activity LED2
	Reserved		
0x1414 ... 0x144F			
0x1450	UINT8		Run/Idle Status
	Reserved		
0x1451 ... 0x148F			
0x1490	UINT32	0	System Time (Bit 0 to 7)
		1	System Time (Bit 15 to 8)
		2	System Time (Bit 23 to 16)
		3	System Time (Bit 31 to 24)
0x1491			
0x1492 ... 0x14CF	Reserved		
0x14D0	UINT32	0	System Time PLC (Bit 0 to 7)
		1	System Time PLC (Bit 15 to 8)
		2	System Time PLC (Bit 23 to 16)
		3	System Time PLC (Bit 31 to 24)
0x14D1			
0x14D2 ... 0x150F	Reserved		
0x1510	UINT32	0	System Time Web (Bit 0 to 7)
		1	System Time Web (Bit 8 to 15)
		2	System Time Web (Bit 16 to 23)
		3	System Time Web (Bit 24 to 31)
0x1511			
0x1512 ... 0x154F	Reserved		
0x1550	UINT8[4]	0	Inter-Output Short Circuits (Output 0 to 7)
		1	Inter-Output Short Circuits (Output 8 to 15)
		2	Inter-Output Short Circuits (Output 16 to 24)
		3	Inter-Output Short Circuits (Output 25 to 31)
0x1551			
0x1552 ... 0x174F	Reserved		
0x1750	UINT32	0	Timestamp, Bit 7...0
		1	Timestamp, Bit 15...8
		2	Timestamp, Bit 23...16
		3	Timestamp, Bit 31...24
0x1751	UINT16	0	Event-ID, Bit 7...0
		1	Event-ID, Bit 15...8
0x1752	UINT32	0	Additional Event Data, Bit 7...0
		1	Additional Event Data, Bit 15...8
0x1753	UINT32	2	Additional Event Data, Bit 23...16
		3	Additional Event Data, Bit 31...24
0x1754			
0x1755 ... 0x178F	Reserved		
0x1790 ... 0x214F	Diagnostic Log#2 ... Diagnostic Log#40 (Identical to Diagnostic Log#1)		
0x2150 ... 0xFFFF	(Illegal Data Address)		

Input Register (3x): The 16-bit word registers of this table are read-only accessible.

Address	Type	Byte	Name	
0x0000	UINT16	0	Module Error Input (Bit 0 to 7)	
		1	Module Error Input (Bit 8 to 15)	
0x0001	UINT8[4]	0	Channel Error (Bit 0 to 7)	
		1	Channel Error (Bit 8 to 15)	
2		Channel Error (Bit 16 to 23)		
3		Channel Error (Bit 24 to 31)		
0x0002				
0x0003	UINT16	0	Module Info Flags (Bit 0 to 7)	
		1	Module Info Flags (Bit 8 to 15)	
0x0004 ... 0x07FF	Reserved			
0x0800	UINT16		Diagnostic Event Counter	NOT USED
0x0801	UINT8[2]	0	Diagnostic Event #1, Low Byte: Event Code	
		1	Diagnostic Event #1, High Byte: Severity	
0x0802	UINT8[2]	0	Diagnostic Event #2, Low Byte: Event Code	
		1	Diagnostic Event #2, High Byte: Severity	
0x0803 ... 0x0806	UINT8[2]		(And so on...) Diagnostic Event #3...#6	
0x0807 ... 0xFFFF	(Illegal Data Address)			

NOT
USED

Discrete Input (1x): The one single bit registers of this table are read-only accessible.

Address	Content
0x0000	Module Error Input, Bit 0: AUX Voltage Warning
0x0001	Module Error Input, Bit 1: AUX Voltage Error
0x0002	Module Error Input, Bit 2: Logic Voltage Warning
0x0003	Module Error Input, Bit 3: Logic Voltage Error
0x0004	Module Error Input, Bit 4: Temperature Warning
0x0005	Module Error Input, Bit 5: Output Driver Channel Error
0x0006	Module Error Input, Bit 6: Module Error
0x0007	Module Error Input, Bit 7: Output State Not Available
0x0008 ... 0x000F	Reserved
0x0010	Channel Error , Channel 0
0x0011	Channel Error , Channel 1
0x0012 ... 0x002F	(And so on...) Channel Error, Channel 2 to 31
0x0030	Module Info Flag, Bit 0: Heartbeat not toggling AUX1
0x0031	Module Info Flag, Bit 1: Heartbeat not toggling AUX2
0x0032	Module Info Flag, Bit 2: SPI_COM_ERROR AUX1
0x0033	Module Info Flag, Bit 3: SPI_COM_ERROR AUX2
0x0034	Module Info Flag, Bit 4: SPI_COM_LOST_AUX1
0x0035	Module Info Flag, Bit 5: SPI_COM_LOST_AUX2
0x0036	Module Info Flag, Bit 6: Output Interconnect Error
0x0037	Module Info Flag, Bit 7: SPI_NP40_ERROR
0x0038	Module Info Flag, Bit 8: NP40_Version_Error
0x0039 ... 0x003F	Reserved
0x0040 ... 0xFFFF	(Illegal Data Address)

Coils (1x): The one single bit registers of this table are read/Write accessible.

Address	Content
0x0000...0x0007	System Commands (Bit 0 to 7)
0x0008	Solenoids (Bit 0)
0x0009	Solenoids (Bit 1)
0x000A ... 0x0027	(And so on...) Solenoids (Bit 2...31)
0x0028 ... 0xFFFF	(Illegal Data Address)

Parker Hannifin Corporation

Pneumatic Division

8676 E. M89

Richland, MI 49083 USA

Phone: 269 629 5000

Applications Engineering: E-mail: pdn.technical@support.parker.com

Customer Support: E-mail: pdncustsvc@parker.com

www.parker.com/pneumatics

