

AVENTICS™

580 PROFINET Technical Manual



Conditions For Use of This Product

AVENTICS™ G3 Manifold ("the PRODUCT") SHALL NOT BE USED IN CONDITIONS where any problem, fault or failure occurring in the PRODUCT may lead to any incident resulting in damage to property, serious injury or loss of life and where the end user does not have appropriate external backups and fail-safe measures incorporated within the systems that the PRODUCT is used.

The PRODUCT has been designed and manufactured for use in general industries. Therefore, the PRODUCT and related document(s) are not for use in any nuclear and/or medical related applications.

For avoidance of doubt, AVENTICS and its affiliated companies shall have no responsibility or liability including but not limited to any and all responsibility or liability based on contract, warranty, tort, product liability for any injury or death to persons, loss or damage to property caused by the product that are operated or used in application not intended or excluded by instructions, precautions or warnings contained in AVENTICS documentation including any Technical, User, Instruction, Safety manuals or bulletins.

Intended Use of This Product

AVENTICS valve systems or I/O stand-alone systems with integrated fieldbus communications are designed to be used on specific industrial control networks. Emerson recommends that industry best practices are followed for network segmentation and avoid exposing valve system or stand-alone systems with integrated fieldbus communication directly to the internet. If external connections are available on the control network or control system, an appropriate firewall should always be used.

Additionally, the following recommendations should be followed:

- Minimize internet and business network exposure for all control system devices and/or systems and ensure that they are not accessible from the Internet.
- Locate control system networks and remote devices behind firewalls and isolate them from the business network.
- If remote access is required, only use secure methods such as Virtual Private Networks (VPNs) and recognize that VPNs may have vulnerabilities and should always be updated to the most current version available. Also recognize that a VPN is only as secure as the connected devices it serves.
- **NETWORK SECURITY IS YOUR RESPONSIBILITY! It is the responsibility of every user to assess their own level of risk with regards to the specific aspects of each application and determining appropriate related action.**

Safety Precautions

Before using this product, please read this manual and the relevant manuals carefully and pay attention to safety and product application. The following symbols are used in the manual to identify important safety, installation, and application information.



CAUTION

The *CAUTION* symbol indicates a possible hazard which may cause injury or equipment damage. Please review and take appropriate action.



The *NOTE* symbol indicates important information regarding equipment installation and setup. Please review and take appropriate action.

Electrical Installation and Operational Guidelines



CAUTION

- AVENTICS valve systems with integrated fieldbus communications must only be connected to a Class 2 power source.
- All AVENTICS communication nodes should be grounded during the installation process. Proper grounding guidelines can be found in National Electrical code IEC 60204-1 or EN 60204-1.
- All AVENTICS G3 Electronics Products must only be installed or wired in accordance with ASCO AVENTICS published instructions and applicable electrical codes.
- When using MULTIPLE CLASS 2 POWER SOURCES all sources shall be Listed and rated suitable for parallel interconnection.
- All field wiring shall be suitable for Class 1, Electric Light and Power, or if Class 2, 3 wirings, such wirings shall be routed separately and secured to maintain electrical and physical separation between Class 2 wiring and all other class wiring and limited energy circuit conductors from unlimited energy circuit conductors.
- When using Class 2 Device Wiring Only, you SHALL NOT Reclassify and Install as Class 1, 3 or Power and Lighting Wiring.
- When using molded connector power cables, DO NOT RELY ON WIRE COLORS FOR PIN-OUT; Always use pin number references.
- Wire connections shall be rated suitable for the wire size (lead and building wiring) utilized.

Table of Contents

	<u>PAGE</u>
1. About PROFINET™	5
1.1 Overview	5
1.2 580 PROFINET™ Node Features	5
2. 580 PROFINET™ Introduction	6
2.1 Pneumatic Valve Manifold – 501 Series shown	7
2.2 500 Series Manifold Stations	8
2.3 Z-Board™ Connectors	9
3. Zoned Power	10
3.1 Zoned Power Safety and 580 Electronics alternatives	10
3.2 503 Series Zoned Power application	11
3.3 503 Series Zoned Power example	12
4. Communication Module	13
4.1 580 PROFINET™ Node	13
4.2 580 Node Description	14
4.3 Connector Pin-Outs	15
4.4 Electrical Connections	16
4.5 Chassis Ground	17
4.6 Power Consumption	18
4.7 Recommended External Fuses	19
4.8 Diagnostics – 580 PROFINET™ Node LED Functions	20
5. Extended Coil Capability	21
5.1 500 Series Extended Coil Configurations	21
5.2 500 Series Extended IO Mapping	24
5.3 501 Series, up to 64 solenoid coils	25
5.4 501 Series, up to 128 solenoid coils	26
5.5 502 and 503 Series, up to 80 coils	27
6. Profinet Node Graphic Display	28
6.1 Station Name	29
6.2 IP Address Sub Menu	29
6.3 Subnet Mask Sub-Menu	30
6.4 Gateway IP	31
6.5 Config. Mode	32
6.6 Web Server Sub-Menu	33
6.7 MAC Address Sub-Menu	34
6.8 Model Number Sub-Menu	34
6.9 Advanced Settings – Flip Display	35
6.10 Advanced Settings – Parameters	36
6.11 Factory Defaults Factory Defaults	37
6.12 Diagnostics	38
6.14 Diagnostics Self-Test	38
6.14 Error Messages	40
7. PROFINET™ Integrated Web Server	41
7.1 Connecting to an Aventics 580 Profinet™ Node	41
7.2 Using the Functionality of the 580 Profinet™ Web Server	42
7.3 Station Name and IP Address Configuration	48
7.4 User Configurable Device Parameters	49
7.5 Communication Fault/Idle Mode Parameter	50
8. 580 Profinet™ Commissioning	50
8.1 GSDML File	51
8.2 580 Profinet™ PLC Configuration	51
8.3 580 Profinet™ Station Name	55
9. PROFINET™ Mapping	56
9.1 I/O Sizes	56
9.2 Bit Mapping Rules	56
9.3 Mapping Example No. 1	57
9.4 Mapping Example No. 2	58
10. Appendix	59
10.1 System Specifications	59
10.2 Factory Default Settings	59
10.3 Troubleshooting	60
10.4 Glossary of Terms	60



1. About PROFINET™

1.1 Overview

PROFINET™ is an Ethernet-based networking solution for automation but has added benefits/features toward manufacturing applications.

PI is the largest fieldbus organization and it is the umbrella organization responsible for both PROFIBUS and PROFINET™ technologies.

PROFINET™ uses industrial M12 IP67-rated connectors. The protocol can transfer data at two interface speeds of 10 Mbps and 100 Mbps. Maximum network cabling distance is limited to 100m segments at 20° C.

More information about PROFINET™ and PI can be obtained from the PI web site <http://us.profinet.com/>

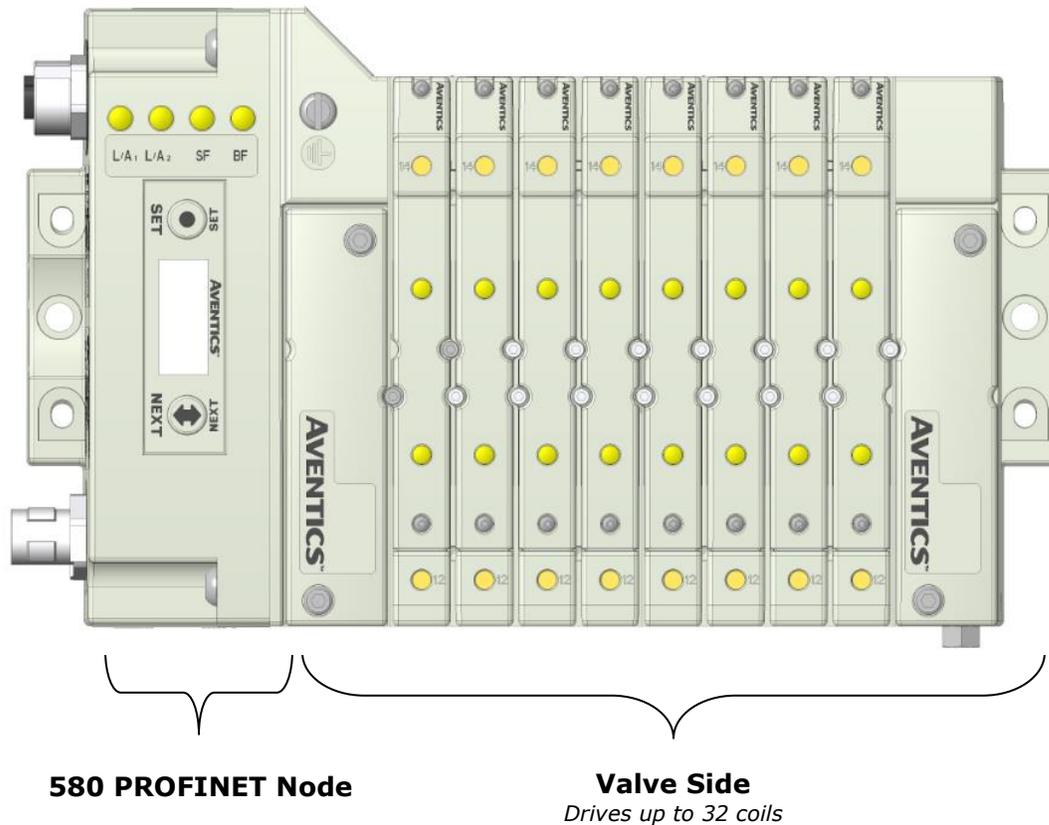
1.2 580 PROFINET™ Node Features

<i>Features</i>	<i>Description</i>
Spec. Supported	Designed to PROFINET™ Specification
Bus Topology	Star and Multi-Star
Baud Rates Supported	10/100 Mbps and Autobaud
CE	CE Compliant
Duplicate Address Detection	If a duplicate address is detected on power up, duplicates will not progress to run mode
Address Setting	Web Page Configuration, Graphical Display
Duplex	Half and Full supported
Conformance Tested	Tested by PI for conformance according to IEC 61158 / IEC 61784

2. 580 PROFINET™ Introduction

The 580 PROFINET™ Node is an electronic interface that features an integrated graphic display for simple commissioning and displaying of diagnostic information. The 580 PROFINET™ Node mates to a variety of valve series including, the 501, 502, and 503. The 580 PROFINET™ Node is capable of addressing a total of (32) coil outputs, with diagnostic functionality built in. With proper assembly and termination, the 580 PROFINET™ Node has an IP65 rating.

This manual describes specific information for configuring and commissioning the Aventics 580 PROFINET™ Node. For more information relating to pneumatic valving and valve manifold assemblies, please refer to the Aventics *501 and 503 Series catalogs* at www.asco.com.



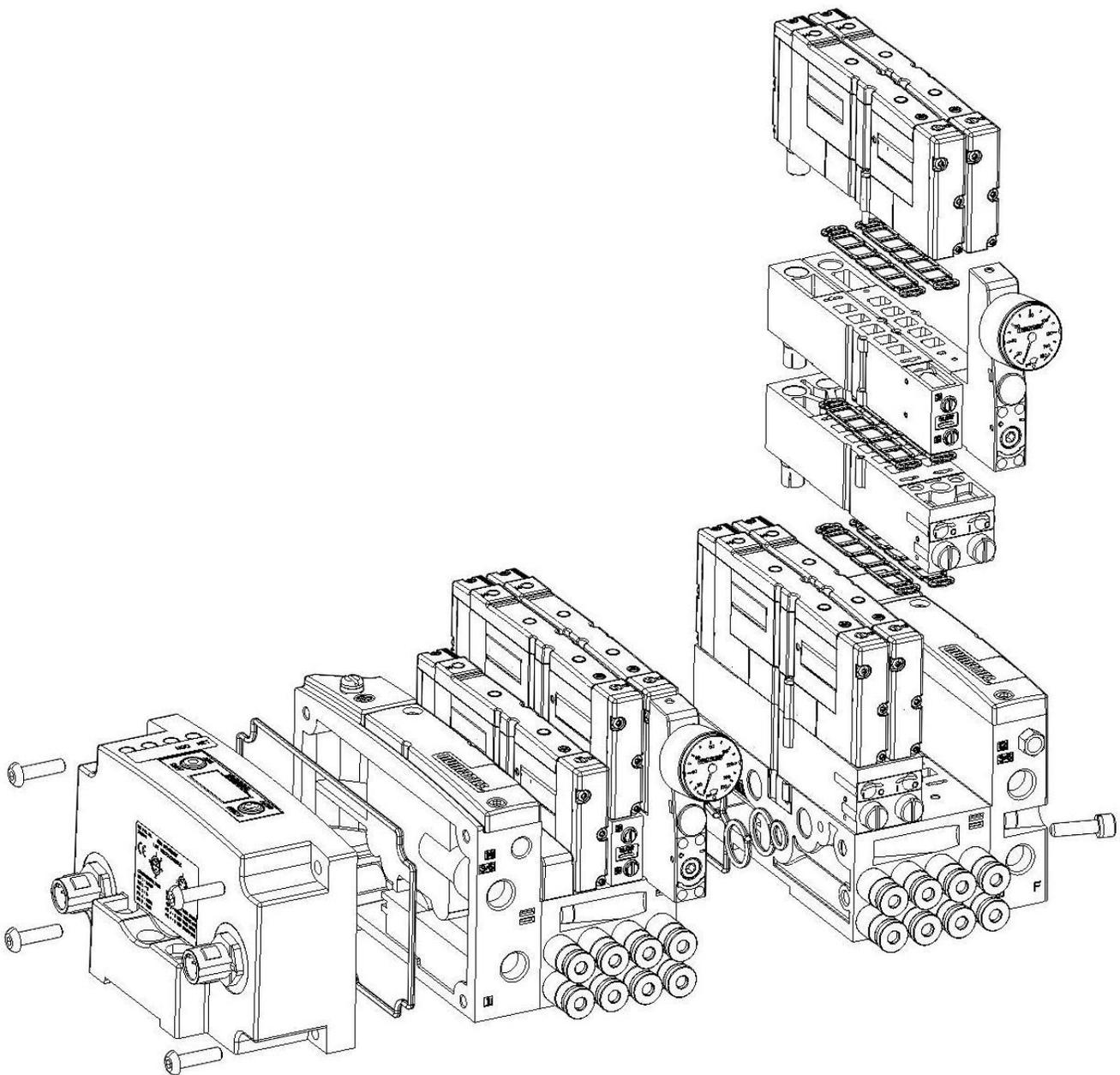
580 PROFINET Node

Valve Side

Drives up to 32 coils

2.1 Pneumatic Valve Manifold – 501 Series shown

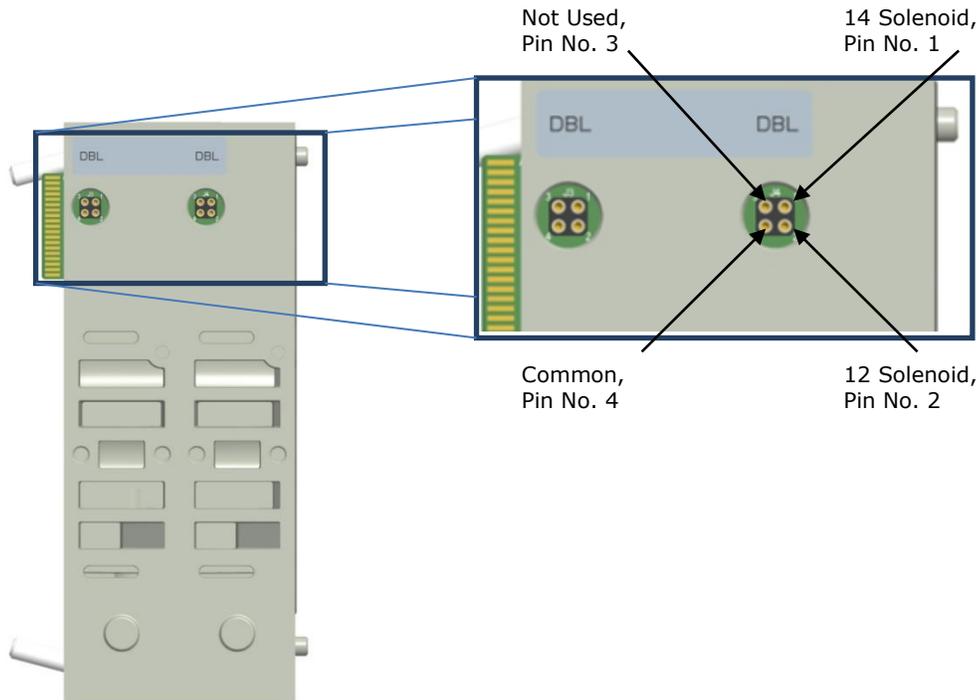
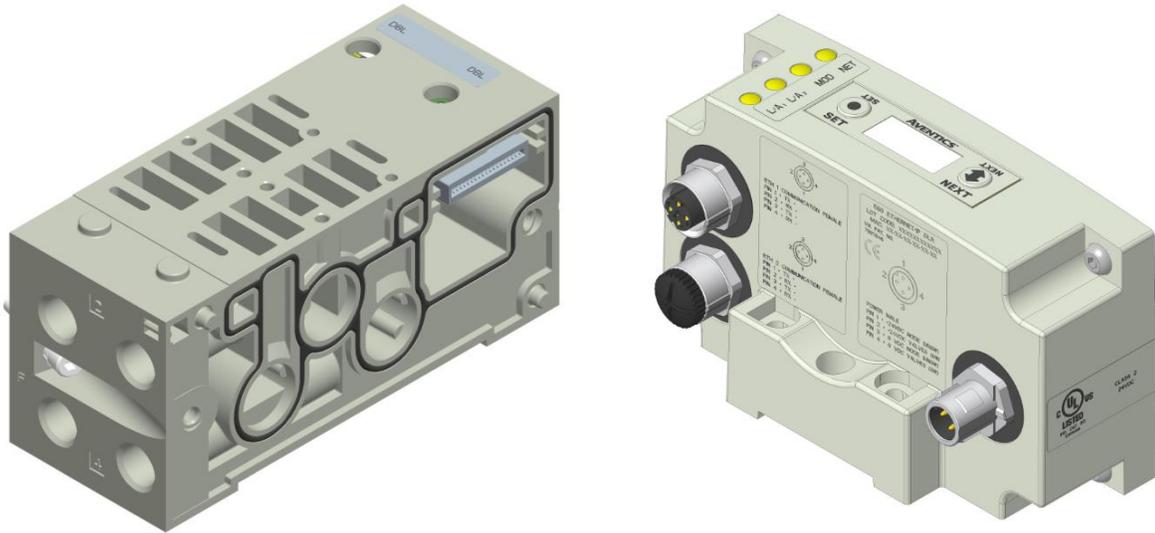
The pneumatic valve manifold with internal circuit board technology is modular. The valve solenoid coil connections are automatically made using Z-Board™ technology (plug together PC boards, which allow internal connection from solenoid coils to output drivers without the use of wires). This allows easy assembly and field changes.



2.2 500 Series Manifold Stations

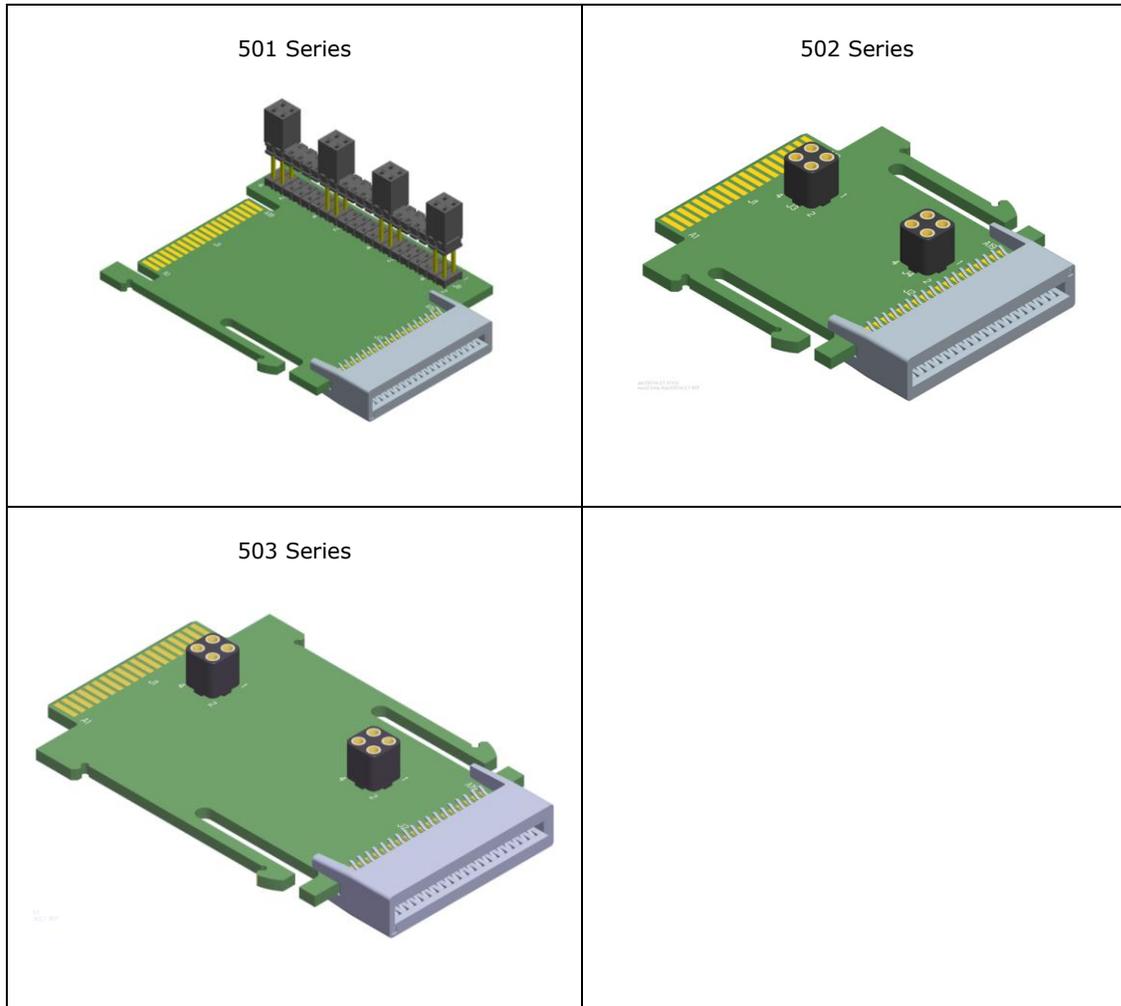
Solenoid Coil Connections using Z-Board™ Technology for 50x valve series

Z-Board™ plug together technology connects all valve solenoids to the valve coil output driver board, located in the valve adapter. There is a maximum of 128 coil outputs available on the complete manifold assemblies. The 128 available outputs are accessed on the 501 series valves utilizing 4 station manifolds and on the 502 and 503 series utilizing 2 station manifolds.



2.3 Z-Board™ Connectors

The 501/502/503 valve series utilize 2 different Z-Board™ designs to achieve the single and double solenoid output functions. This yields the possible 32 single, 16 double, or various combinations of valve coil output capabilities. The 501 Z-Board™ is minimum (4) stations, the 502 and 503 Z-Board™ is minimum (2) stations.



Each series Z-Board™ can be selected in either SINGLE or DOUBLE output (coil) versions. The SINGLE and DOUBLE output function cannot be mixed on the Z-Boards™

3. Zoned Power

3.1 Zoned Power Safety and 580 Electronics alternatives

Aventics 580 series electronics released as an alternative to allow immediate shipment of AVENTICS 580 series valve manifolds are not approved for Zoned power applications.



CAUTION

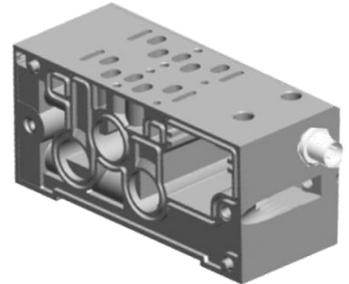
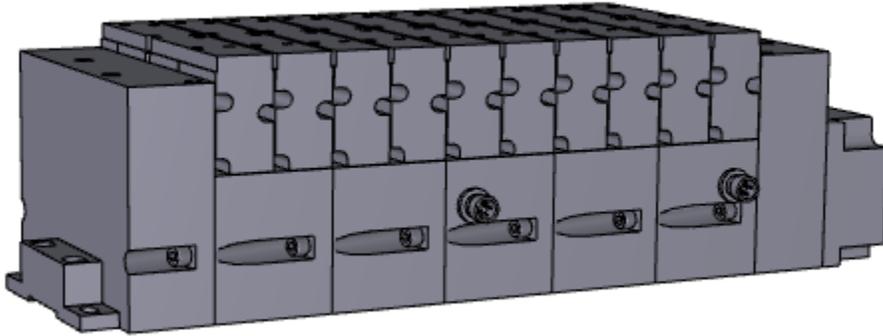
These new alternative valve drivers must not to be used in Zoned Power applications. Zoned Power applications, you must use only approved 580 series electronics.

The following table identifies 580 series electronics approved for Zoned Power applications.

580 Series Electronics approved for Zoned Power Applications	Description
P580AEPN1010A00	580 PROFINET™ Module
P580AEPN1010DRM	580 PROFINET™ Module w/DIN Rail Clips

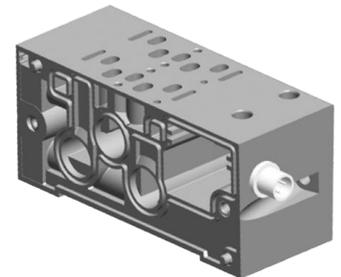
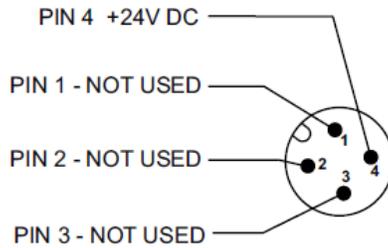
3.2 503 Series Zoned Power application

The Zoned Power Manifold blocks can be incorporated into a 503-manifold assembly to isolate Power to a number of valve stations, independent from the main power of the manifold. This is achieved by the integral 4 Pin M12 connector along with the modified manifold board. The total number of Zoned Power Manifold blocks is determined by the maximum solenoid outputs as defined by the type of interface (e.g. G3 Electronics, Terminal Strip, D-Sub). For user flexibility, the Zoned Power Manifold blocks are available in both "proprietary" and "ISO" versions and can be ordered with the M12 connector starting at the first or second station.



V Wiring Option

W & V Connector Pin Out



W Wiring Option

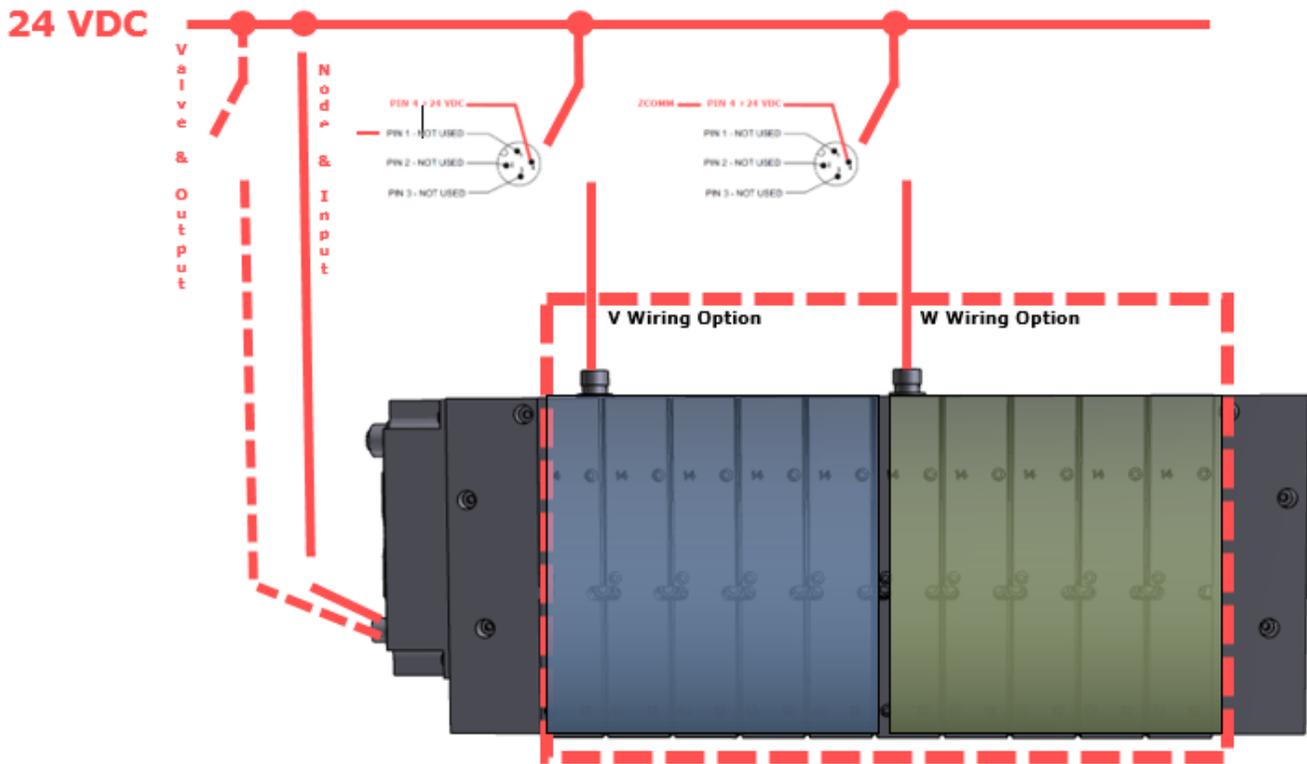
Technical Data

Electrical Data:

Voltage:	24 VDC (0 VDC must be common with main power)
Connection:	4 Pin M12 Single Key Male
Environmental:	IP65 (with proper connection)

3.3 503 Series Zoned Power example

In the example shown below there are two Zoned Power Manifold blocks used. One is a "V" wiring option and the other is a "W" wiring option. The first (5) stations of the manifold assembly get their power from the M12 4 Pin connector at station one. The next (5) stations get their power from the M12 4 Pin connector at station six. Each of these "Zones" can be individually switched if the machine or process requires. This example is considered a manifold with (2) Power Zones. The Main Power (7/8" MINI) cannot be considered or used as a Power Zone; Switched Power (Solenoid/Output Power) **MUST** be present for control to the solenoids.



The 0 VDC reference for the +24 VDC applied to Pin 4 of the M12 connector **MUST** be the same as the one used on G3/580/Terminal Strip/25 or 37 Pin Sub-D/19 or 26 Pin Round Connector. If multiple 24 VDC power supplies are used the 0 VDC references of each supply **MUST** be common.

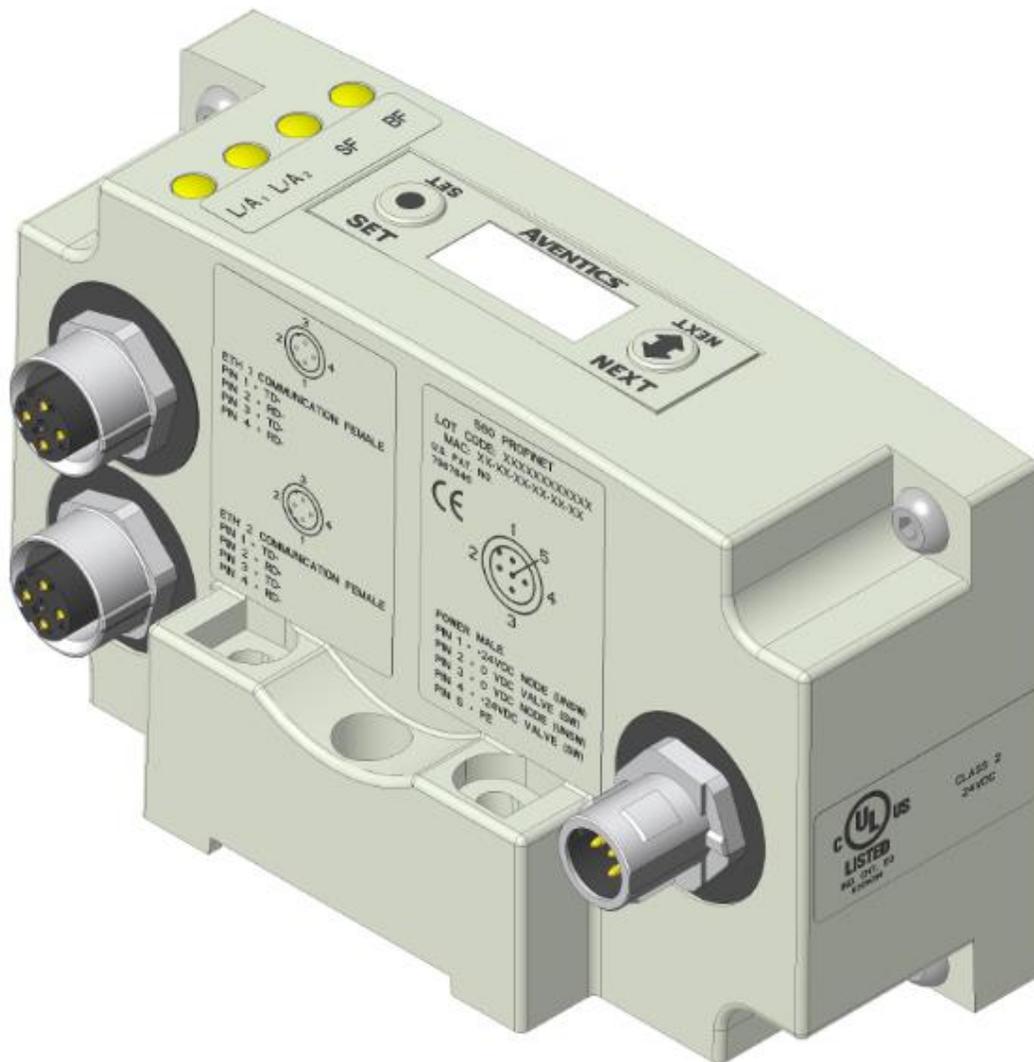
4. Communication Module

4.1 580 PROFINET™ Node

This module is the communication interface to the manifold. It contains communication electronics and internal short circuit protection for power. It can be configured via the graphic display or via software

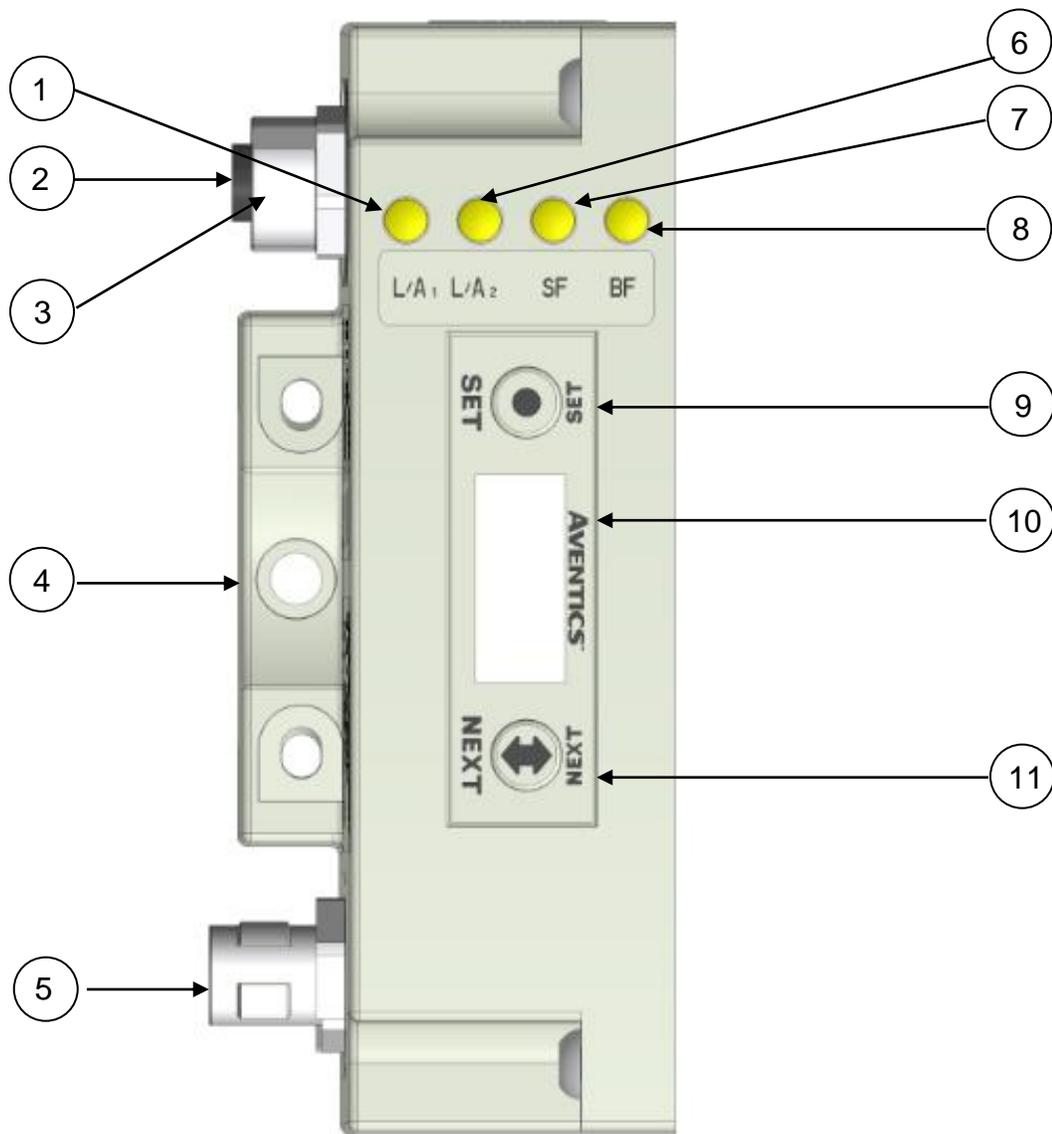
The Aventics 580 PROFINET™ node is tested by the PIC to ensure compatibility and interoperability.

Communication Interface	Part Number
580 PROFINET™ Node	P580AEPN1010A00
580 PROFINET™ Node w/DIN Rail	P580AEPN1010DRM



4.2 580 Node Description

Detail No.	Description
1	Link /Activity LED
2	5 Pin M12 Female Communication Connector per PTO specification
3	5 Pin M12 Female Communication Connector per PTO specification
4	Mounting Hole
5	5 Pin M12 Male Power Connector
6	Link / Activity LED
7	System Fault LED
8	Bus Fault LED
9	SET Button - used to navigate through user menus and to set parameters
10	Graphic Display - used to display parameter information
11	NEXT Button - used to navigate through user menus and to set parameters



4.3 Connector Pin-Outs

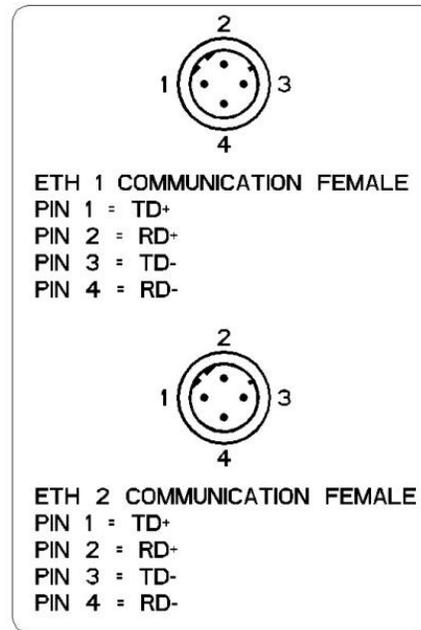
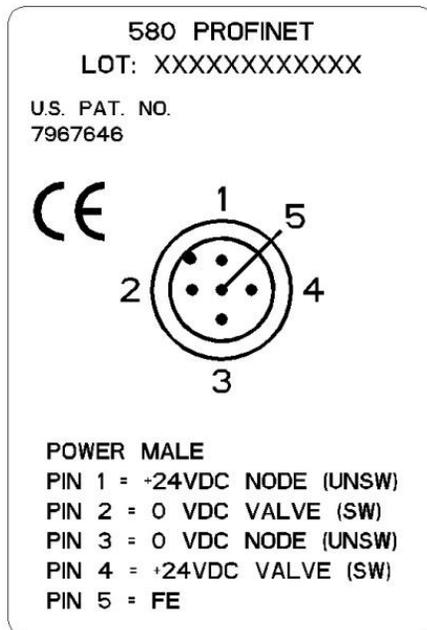
Industry standard connectors are used for communication and power. The PROFINET™ communication connectors are (2) M12 D-Coded 4 pin female connectors. The Power connector is an M12 5 pin male connector.

PROFINET™ Communication Connector Pin-Out

Pin No.	Function	Description (FEMALE)
1	TD+	Positive Transmit Line
2	RD+	Positive Receive Line
3	TD-	Negative Transmit Line
4	RD-	Negative Receive Line

Power Connector Pin-Out

Pin No.	Function	Description (MALE)
1	+24 VDC (Node)	Voltage used to power node electronics UNSW
2	0 VDC Common (Valves)	0 VDC Voltage used to power outputs (Valves) SW
3	0 VDC Common (Node)	0 VDC Voltage used to power node electronics UNSW
4	+24 VDC (Valves)	Voltage used to outputs (Valves) SW
5	FE	Functional Earth

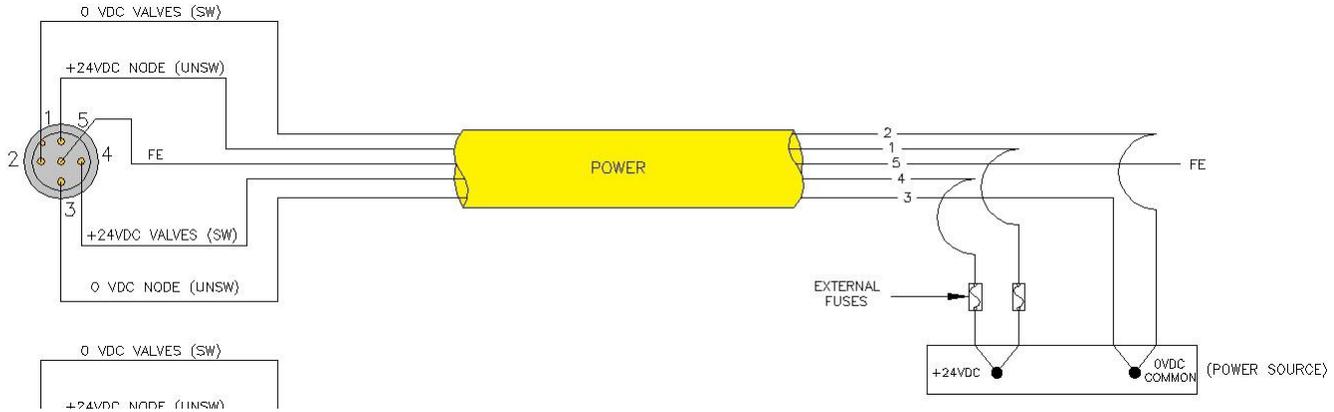


- Power common (0 VDC) pins 2 and 3 are isolated from each other to allow separate (isolated) power supply connection if required. However, they can be tied together if a single common, non-isolated, application is preferred.
- The draw of the +24VDC Valves (Pin 4) and +24VDC Node (Pin 1), pins cannot exceed 4 Amps, at any given moment in time.
- The Node pins supplies power to the node electronics. These pins must be powered at all times for communication node to be functional.
- To be connected to Class 2 power source only

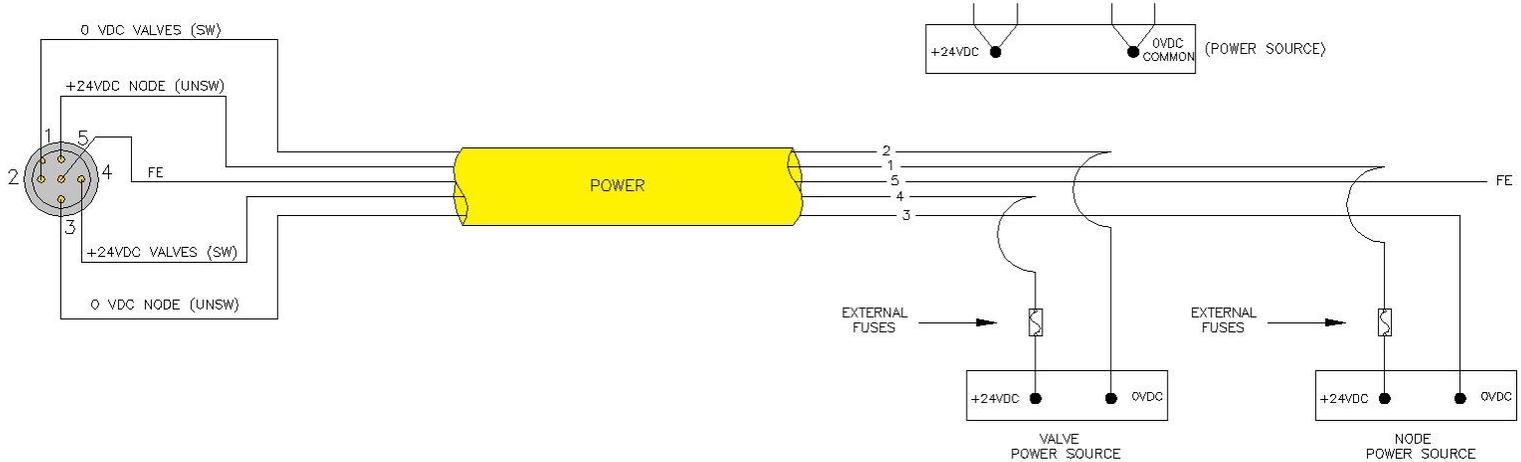
4.4 Electrical Connections

Standard Power Connector Wiring Diagram Examples

Single Power Supply Example (Non-isolated commons)



Separate Power Supply Example (Isolated commons)

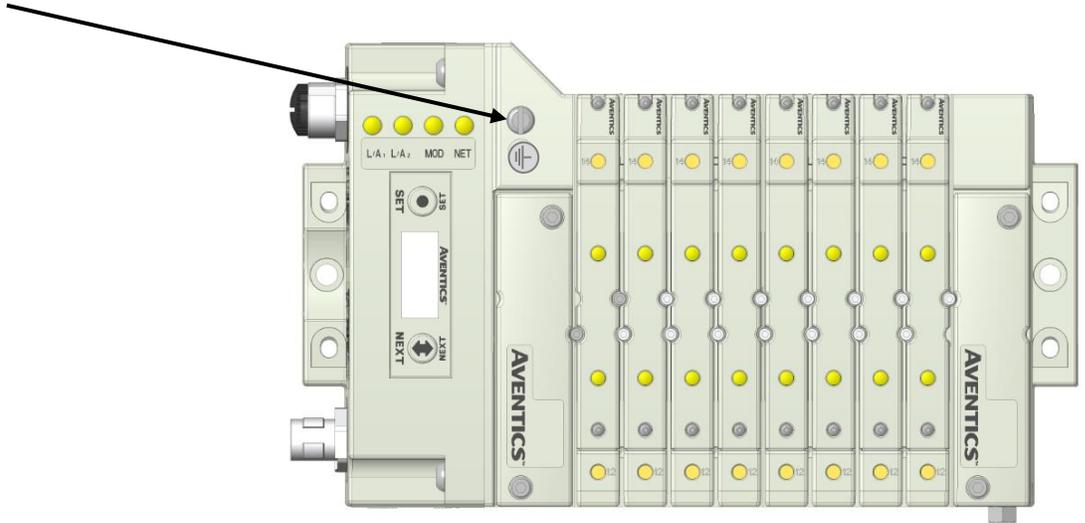


- Please see page 19 for external fuse sizing guide.
- When using molded connector power cables, Do Not rely on wire colors for Pin-Out. Always use pin number references.
- To be connected to a Class 2 power source only
- Class 2 Device Wiring Only – Do Not Reclassify and Install as Class 1, 3 or Power and Lighting Wiring.
- Wire connections shall be rated suitable for the wire size (lead and building wiring) employed.
- CLASS 2 WIRING: All filed wiring shall be suitable for class 1, Electric Light and Power, or Class 2, Class 3 wirings are routed separately and secured to maintain separation between 1) Class 2 wiring and all other class wiring, and 2) limited energy circuit conductors from unlimited energy circuit conductors.
- MULTIPLE CLASS 2 POWER SOURCES: when interconnects, Class 2 sources shall be listed and rated suitable for parallel interconnection.

4.5 Chassis Ground

All Aventics manifolds should be grounded for safety. Grounding guidelines can be found in National Electrical code IEC 60204-1 or EN 60204-1.

CHASSIS GROUND CONNECTION POINT,
501 VALVES



CHASSIS GROUND CONNECTION POINT,
502 & 503 VALVES



CAUTION

- When grounding to a machine frame, please ensure that the machine frame itself is already properly grounded.
- Better grounding can be achieved when larger diameter (lower gauge) wire is used.

4.6 Power Consumption

Power Connection

Pin No.	Function	Description
1	+24 VDC (Node)	Voltage used to power node electronics UNSW
2	0 VDC Common (Valves)	0 VDC Voltage used to power outputs (Valves) SW
3	0 VDC Common (Node)	0 VDC Voltage used to power node electronics UNSW
4	+24 VDC (Valves)	Voltage used to outputs (Valves) SW
5	FE	Functional Earth

Power Rating

- The maximum system current capability is 4 Amps.

Component	Voltage	Tolerance	+24VDC (Valve) Pins 2 and 4		+24VDC (Node) Pins 1 and 3	
			Current	Power	Current	Power
Solenoid Valve Coil 501 (Each)	24 VDC	+10%/-15%	0.03 Amps	0.8 Watts	NA	NA
Solenoid Valve Coil 502 (Each)	24 VDC	+10%/-15%	0.04 Amps	1.0 Watts	NA	NA
Solenoid Valve Coil 503 (Each)	24 VDC	+10%/-15%	0.07 Amps	1.7 Watts	NA	NA
580 PROFINET™ Node	24 VDC	+/- 10%	NA	NA	0.110 Amps	2.64 Watts



- Do not exceed 4 amps of current through the M12 Power connector.

4.7 Recommended External Fuses

External fuses should be chosen based upon the physical manifold configuration. Please refer to table below for the fuse sizing chart.

External Fuse Sizing Chart

<i>Power Consumption - Power Connector Pin for VALVES</i>		
<u>Description</u>		<u>Current</u>
Number of Solenoid Valve Coils Energized Simultaneously		
___ X 0.03 A (501 Series)	=	_____ Amps
___ X 0.04 A (502 Series)	=	_____ Amps
___ X 0.07 A (503 Series)	=	_____ Amps
	Total:	_____ Amps
	Surge Compensation:	X 1.25
Suggested External +24 VDC (Valves) Fuse Value:		_____ Amps
<i>Power Consumption - Power Connector Pin for NODE</i>		
<u>Description</u>		<u>Current</u>
Communication Node Power Consumption	=	0.110 Amps
	Surge Compensation:	X 1.25
Suggested External Pin +24 VDC (Node) Fuse Value:		0.1375 Amps



- The Node Power pins supply power to the node electronics. These pins must be powered at all times for the communication node to be functional.
- Reverse polarity protection is provided.

4.8 Diagnostics – 580 PROFINET™ Node LED Functions

Upon power up, the SF, BF, L/A₁ and L/A₂ LEDs indicate the state of the unit and the network connections. There are four LEDs on the 580 PROFINET™ node. The LEDs functions are described in the table below.



LED Name	Color	Status	Description
SYSTEM FAULT (SF)	Off	OFF	No Error
	Red	ON	Watchdog timeout; Channel+Device Diagnostic Present; System Error
		FLASHING	DCP service is initiated via the bus
BUS FAULT (BF)	Off	OFF	No Error
	Red	ON	No Configuration; Low speed physical link; or No physical link
		FLASHING	No data exchange
L/A ₁	Off	OFF	No Ethernet connection is detected
	Green	ON	The module is connected to an Ethernet network
		FLASHING	Data is being sent / received by the node
L/A ₂	Off	OFF	No Ethernet connection is detected
	Green	ON	The module is connected to an Ethernet network
		FLASHING	Data is being sent / received by the node

5. Extended Coil Capability

Below is a list of the minimum firmware level that support the Extended Coil Manifolds.

Extended Solenoid Coil Capability requirements:		
Module	Part Number	Firmware
Communication Module	P580AEPN1010A00	Rev 2.001 Build 43054

Module firmware revision levels can be confirmed in the integrated graphic display and the built-in web browser. See pg. 38 for more information.

5.1 500 Series Extended Coil Configurations

The Extended Coil Manifold can be configured to control 3 additional extended coil valve driver assemblies; unless already configured from the factory. Modify the configuration with either the graphic display interface as shown on page 32 or using the integrated web server configuration page shown on page 22.

Valve Series	Number of Extended Coil Valve Drivers	Total number of coils	Configuration Selection	Allocated number of I/O Bytes designated for valves
501	0	3-32	32 coils	4
	1	33-64	64 coils	8
	2	65-96	96 coils	12
	3	97-128	128 coils	16
502/503	0	1-32	32 coils	4
	1	33-48	64 coils	8
	2	49-64	64 coils	8
	3	65-80	96 coils	12

The following example of the 580-diagnostic webpage "Node Configuration" identifies the details of a manifold configured for 64 possible coils.



Number of Maximum Coils should only be adjusted if one or more additional extended coil valve driver(s) has been physically added.

Node Configuration	
(Green selections denote Factory Default settings)	
Station Name:	<input type="text"/>
IP Address:	<input type="text" value="192.168.1.100"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Gateway IP Address:	<input type="text"/>
Web Server:	<input type="text" value="Enabled"/>
Max Coils on Manifold (32 = Standard):	<input type="text" value="64"/>
Node Configuration Parameters:	<input type="text" value="Unlocked"/>
Fast Startup:	<input type="text" value="Disabled"/>
Display Orientation:	<input type="text" value="Normal"/>

Update Configuration

The following is an example of the 580-diagnostic webpage "Diagnostics" which identifies the details of the valve driver's control of 64 possible coils



Module	Part No.	Description	Details	Activity
Node	P580AEPN101	PROFINET 580 Module	<input type="checkbox"/> Show Details	<input type="button" value="Close all Details"/> <input checked="" type="checkbox"/>
Valves		580 Integrated 1-32 Coils Module	<input checked="" type="checkbox"/> Show Details	<input type="button" value="Close all Details"/> <input checked="" type="checkbox"/>

	Firmware Revision:	1.1																																
	<input checked="" type="checkbox"/> Show Valve Coils 0-31: Check/Uncheck box to force/un-force valve coil	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr> <tr><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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	Valve Status: ● = Shorted Coil ● = Open Coil ✘ = No Coil Detected	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr> <tr><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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	16	17	18	19	20	21	22	23																										
24	25	26	27	28	29	30	31																											
<input checked="" type="checkbox"/> Show Valve Coils 32-63: Check/Uncheck box to force/un-force valve coil	<table border="1"> <tr><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td></tr> <tr><td>40</td><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td></tr> <tr><td>48</td><td>49</td><td>50</td><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td></tr> <tr><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td><td>61</td><td>62</td><td>63</td></tr> </table>	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	
32	33	34	35	36	37	38	39																											
40	41	42	43	44	45	46	47																											
48	49	50	51	52	53	54	55																											
56	57	58	59	60	61	62	63																											
Valve Status: ● = Shorted Coil ● = Open Coil ✘ = No Coil Detected	<table border="1"> <tr><td>32 ✘</td><td>33 ✘</td><td>34 ✘</td><td>35 ✘</td><td>36 ✘</td><td>37 ✘</td><td>38 ✘</td><td>39 ✘</td></tr> <tr><td>40</td><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td></tr> <tr><td>48</td><td>49</td><td>50</td><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td></tr> <tr><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td><td>61</td><td>62</td><td>63</td></tr> </table>	32 ✘	33 ✘	34 ✘	35 ✘	36 ✘	37 ✘	38 ✘	39 ✘	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	
32 ✘	33 ✘	34 ✘	35 ✘	36 ✘	37 ✘	38 ✘	39 ✘																											
40	41	42	43	44	45	46	47																											
48	49	50	51	52	53	54	55																											
56	57	58	59	60	61	62	63																											
<input type="checkbox"/> Show I/O Mappings and Sizes																																		

<input type="checkbox"/> Show Error/Event Log

5.2 500 Series Extended IO Mapping

IO Mapping for each additional 501 series 32 coil valve driver added to the manifold assembly

<i>Output Mapping</i>								
BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
X	Valve Coil No. 7	Valve Coil No. 6	Valve Coil No. 5	Valve Coil No. 4	Valve Coil No. 3	Valve Coil No. 2	Valve Coil No. 1	Valve Coil No. 0
X+1	Valve Coil No. 15	Valve Coil No. 14	Valve Coil No. 13	Valve Coil No. 12	Valve Coil No. 11	Valve Coil No. 10	Valve Coil No. 9	Valve Coil No. 8
X+2	Valve Coil No. 23	Valve Coil No. 22	Valve Coil No. 21	Valve Coil No. 20	Valve Coil No. 19	Valve Coil No. 18	Valve Coil No. 17	Valve Coil No. 16
X+3	Valve Coil No. 31	Valve Coil No. 30	Valve Coil No. 29	Valve Coil No. 28	Valve Coil No. 27	Valve Coil No. 26	Valve Coil No. 25	Valve Coil No. 24

IO

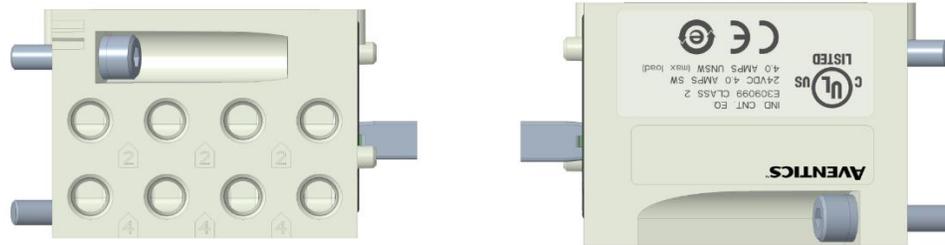
Mapping for each additional 502/503 series 16 coil valve driver added to the manifold assembly

<i>Output Mapping</i>								
BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
X	Valve Coil No. 39	Valve Coil No. 38	Valve Coil No. 37	Valve Coil No. 36	Valve Coil No. 35	Valve Coil No. 34	Valve Coil No. 33	Valve Coil No. 32
X+1	Valve Coil No. 47	Valve Coil No. 46	Valve Coil No. 45	Valve Coil No. 44	Valve Coil No. 43	Valve Coil No. 42	Valve Coil No. 41	Valve Coil No. 40

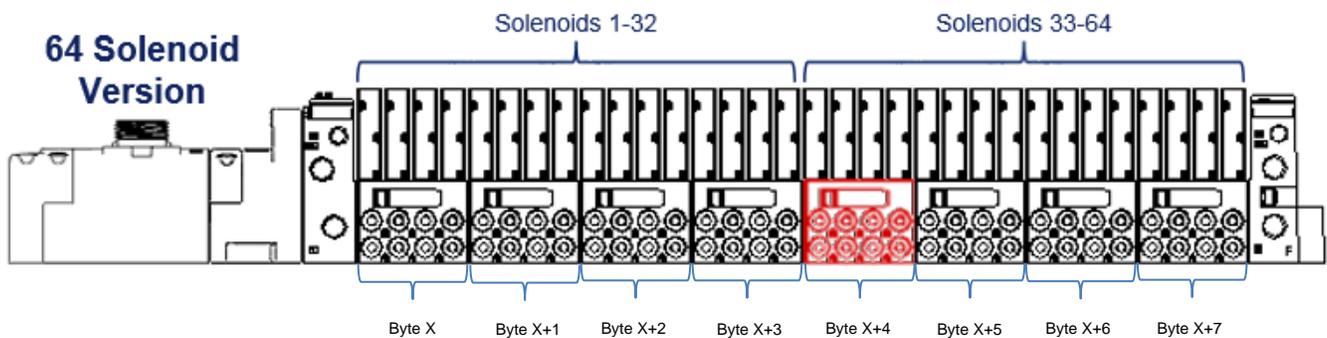
5.3 501 Series, up to 64 solenoid coils

501 series, 4 station manifold block with an integrated 32 coil valve driver

- To be used with 501 series valves on valve manifold assemblies with 33-64 coils.
- Only to be used on assemblies where additional power, supply and/or exhaust capacity is not required



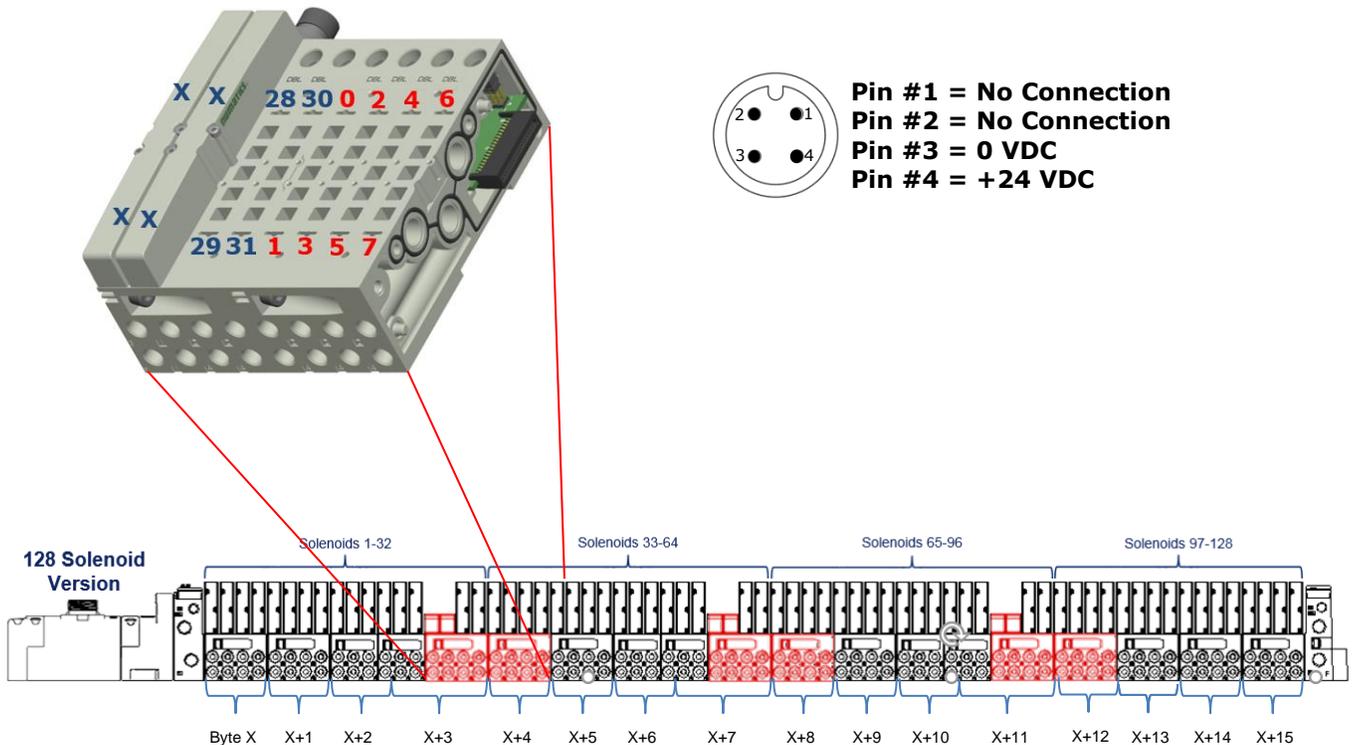
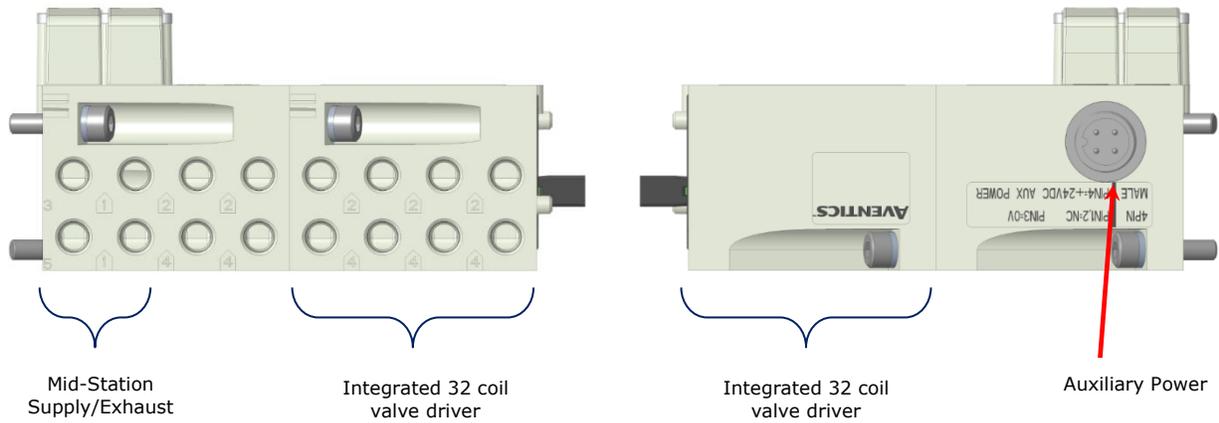
Integrated 32 coil Valve Driver



5.4 501 Series, up to 128 solenoid coils

501 series, 8 station manifold with integrated 32 coil valve driver, auxiliary power connector and mid-station supply and exhaust ports

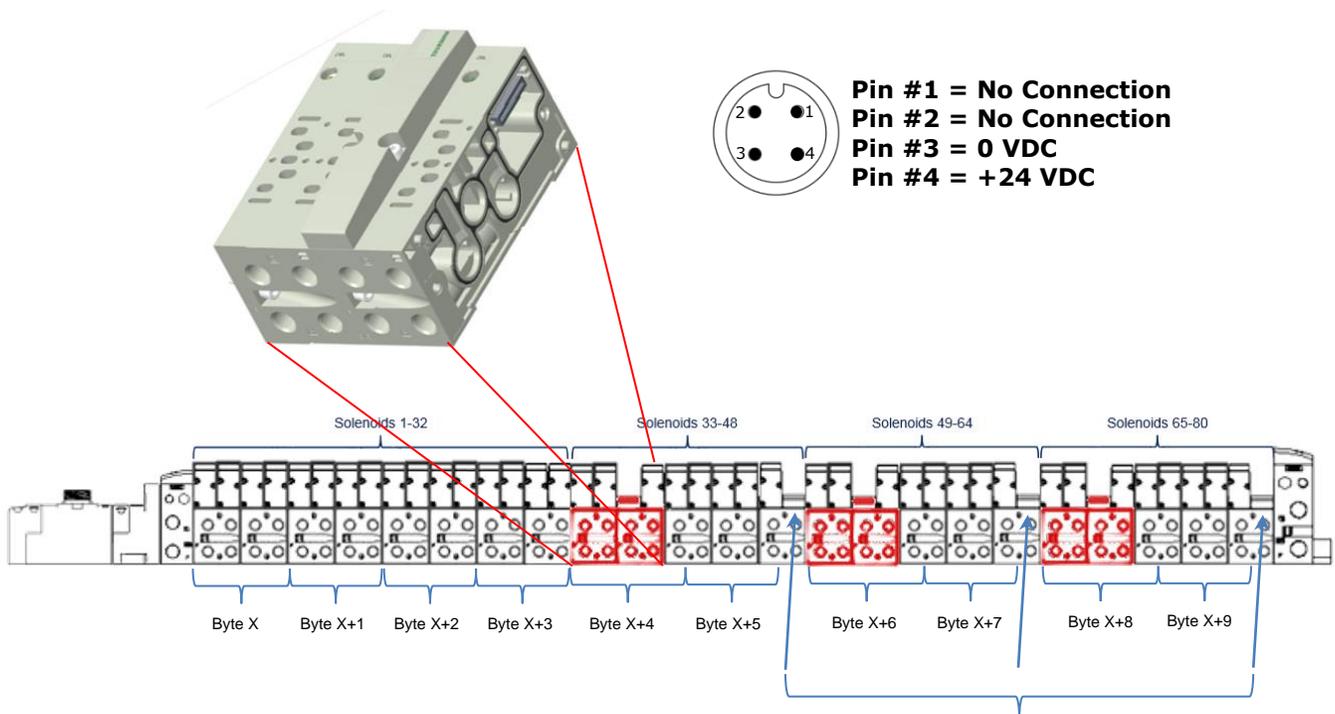
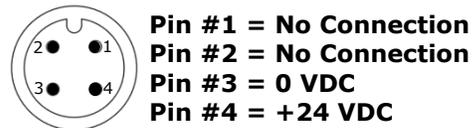
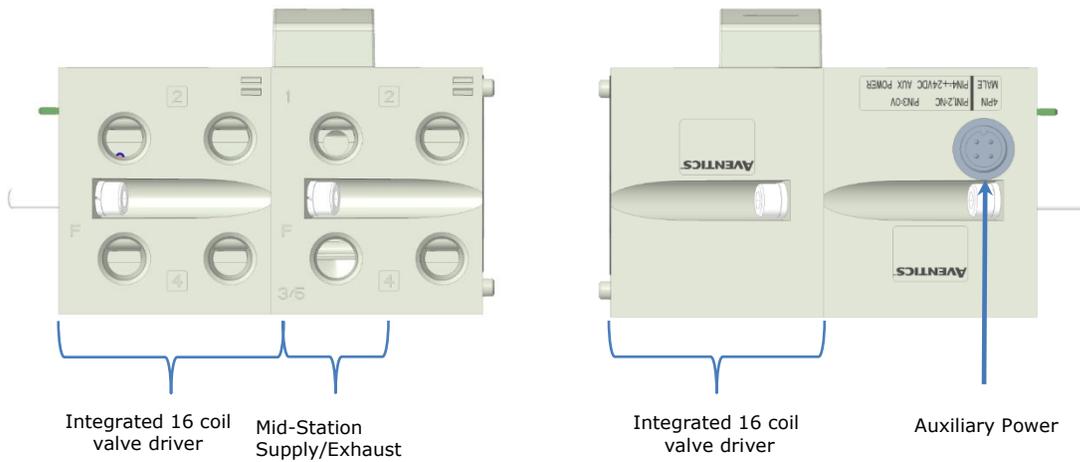
- To be used with 501 series valves on valve manifold assemblies with 33-128 coils.
- Up to 3 of these valve drivers can be used on each assembly
- Required to use on manifold assemblies larger than 64 coils, this manifold block has a M12 power connector to supplement the main power connection on the G3 node and two additional port 1 supply and port 3/5 exhaust ports.
- Aux power is required to be connected to the aux power connector provided on the extended coil valve driver.



5.5 502 and 503 Series, up to 80 coils

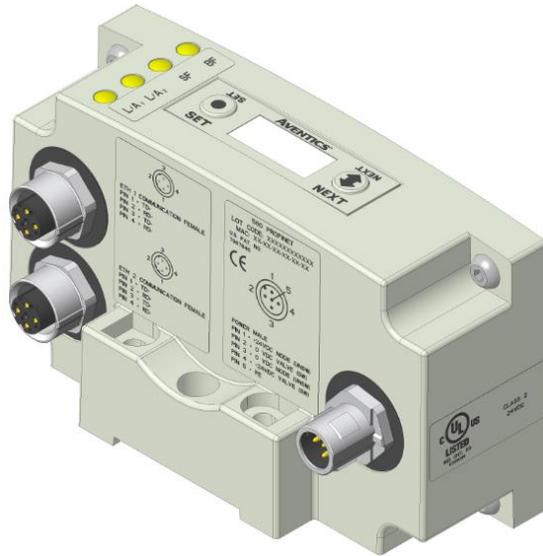
502 and 503 series, 4 station manifold with integrated 16 coil valve driver, power connector and mid-station supply and exhaust ports

- To be used with 502 and 503 series valves on valve manifold assemblies with 33-80 coils.
- Up to 3 of these valve drivers can be used on each assembly
- Required to use on manifold assemblies larger than 32 coils, this manifold block has a M12 power connector and two additional port 1 supply and port 3/5 exhaust ports.
- Aux power is required and will provide power to the 16 coils available via the extended coil valve driver.



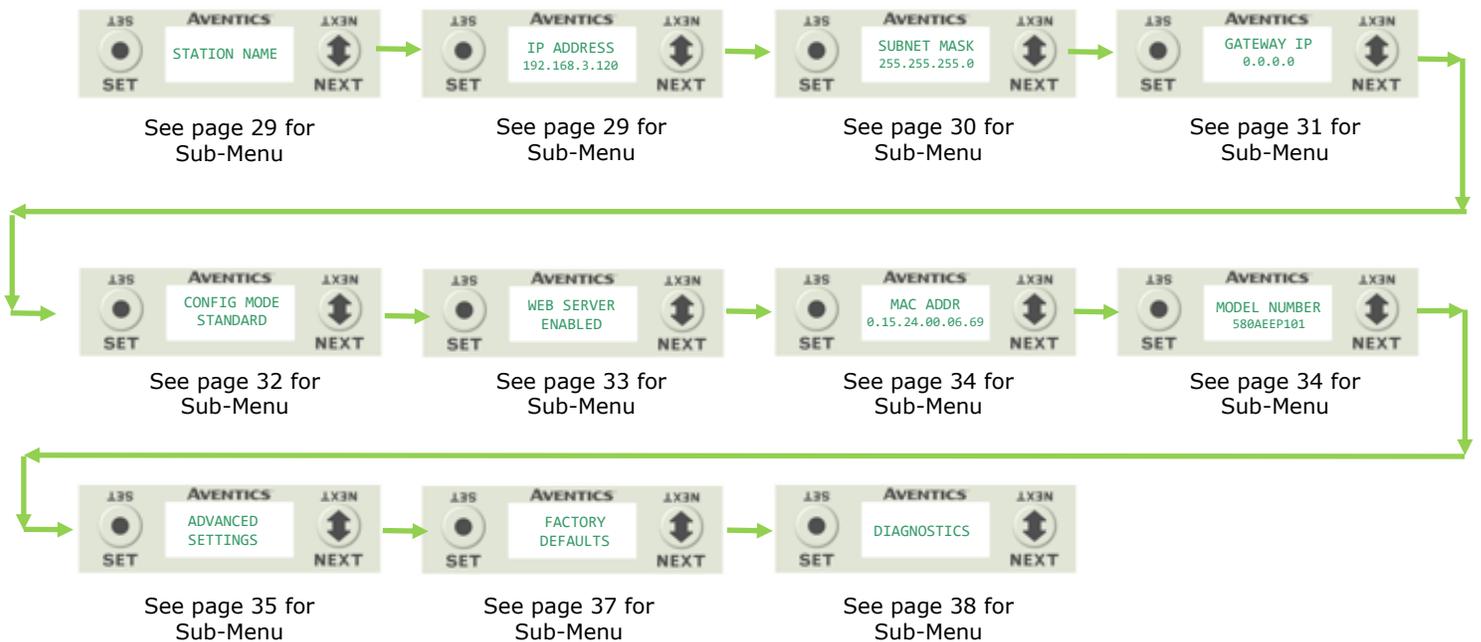
Recommended blank station plates to achieve maximum number of coils with least number of stations

6. Profinet Node Graphic Display



The following graphic displays represent the main menu selections of the 580 PROFINET™ communication (node). Use the NEXT button to scroll through the Main menu headings shown below. At this level pressing the SET button allows access to the Sub-Menus. Please see the appropriate pages referenced below for further details and descriptions of the Sub-Menus. *NOTE: WHEN A NETWORK I/O CONNECTION IS ESTABLISHED, MANUAL CHANGES TO NODE PARAMETERS ARE NOT ALLOWED!*

Home Screen



6.1 Station Name



Station Name

1. The Station Name is addressed through the PLC. It is a text string that describes the function of the station in the application.

6.2 IP Address Sub Menu

Steps to Set IP Address



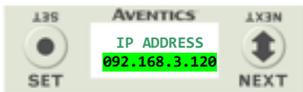
1. Press the SET button to enter the IP ADDRESS sub-menu.



2. Press the NEXT button to select the octet that you would like to change. Press the SET button to change the value.



3. Press the SET button to scroll through the hundred, tens and ones digits of the octet. Press the NEXT button to scroll through the valid digits (0-9).



- Press the SET button to advance through the octet. Press the NEXT button to advance to the next octet, scroll pass the fourth octet to accept the entire IP Address



4. Press the SET button to input the address shown on the display,

5. Press the NEXT button to select **Yes** or **No** to accept the IP Address shown on the display.

- Selecting **No** will bring you back to the main Address menu.
- Selecting **Yes** will take you to the following SAVE SETTINGS menu



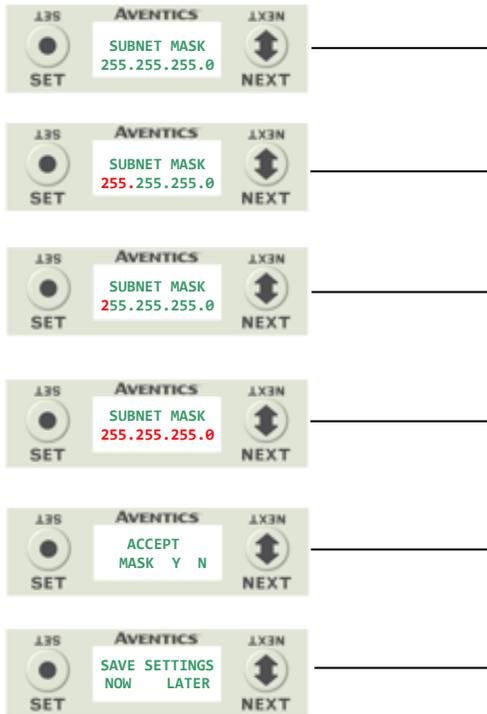
6. Press the NEXT button to select either NOW or LATER.
 - Selecting NOW will cause the node to reset and apply the new setting.
 - Selecting LATER will cause the new Address to be saved in temporary memory to allow you to make additional parameter changes before the node is reset. However, you must ACCEPT the saved changes before your next power cycle otherwise they will be lost.

Press the SET button to confirm your choice.



- *Factory default address is 192.168.3.120*

6.3 Subnet Mask Sub-Menu



Steps to Set Subnet Mask

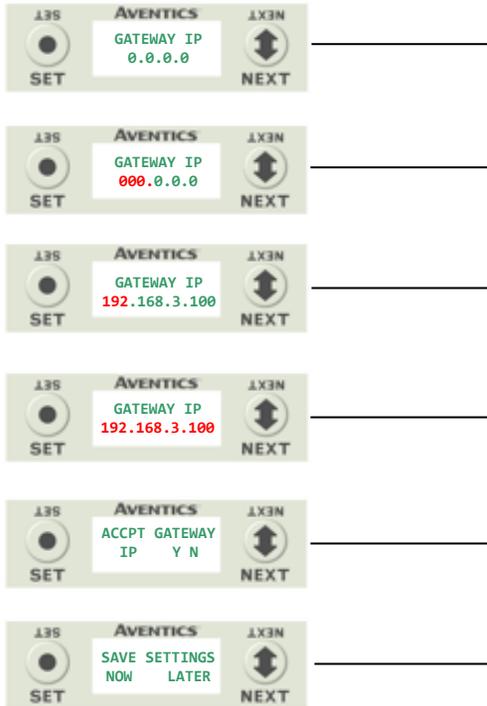
1. Press the SET button to enter the Subnet Mask sub-menu.
2. Press the NEXT button to select the octet that you would like to change.
Press the SET button to change the value.
3. Press the SET button to scroll through the hundred, tens and ones digits of the octet.
Press the NEXT button to scroll through the valid digits (0-9).
Press the SET button to advance through the octet.
Press the NEXT button to advance to the next octet, scroll pass the fourth octet to accept the entire Subnet Mask
4. Press the SET button to input the value shown on the display,
5. Press the NEXT button to select Yes or No to accept the Subnet Mask shown on the display.
 - c. Selecting No will bring you back to the main Subnet Mask menu.
 - d. Selecting Yes will take you to the following SAVE SETTINGS menu
6. Press the NEXT button to select either NOW or LATER.
 - c. Selecting NOW will cause the node to reset and apply the new setting.
 - d. Selecting LATER will cause the new Address to be saved in temporary memory to allow you to make additional parameter changes before the node is reset. However, you must ACCEPT the saved changes before your next power cycle otherwise they will be lost.



- Factory default subnet mask is 255.255.255.0

6.4 Gateway IP

Steps to Set Gateway IP



1. Press the SET button to enter the Gateway IP sub-menu.
2. Press the NEXT button to select the octet that you would like to change. Press the SET button to change the value.
3. Press the SET button to scroll through the octet. Press the NEXT button to scroll through the valid digits (0-9). Press the SET button to advance through the octet. Press the NEXT button to advance to the next octet, scroll pass the fourth octet to accept the entire Subnet Mask
4. Press the SET button to input the value shown on the display,
5. Press the NEXT button to select Yes or No to accept the Subnet Mask shown on the display.
 - e. Selecting No will bring you back to the main Subnet Mask menu.
 - f. Selecting Yes will take you to the following SAVE SETTINGS menu
6. Press the NEXT button to select either NOW or LATER.
 - e. Selecting NOW will cause the node to reset and apply the new setting.
 - f. Selecting LATER will cause the new Address to be saved in temporary memory to allow you to make additional parameter changes before the node is reset. However, you must ACCEPT the saved changes before your next power cycle otherwise they will be lost.

Press the SET button to confirm your choice.



- Factory default Gateway IP is 0.0.0.0

6.5 Config. Mode

Config Mode Settings



1. Press the SET button to enter the Config Mode sub-menu.



2. Press the SET button to change this parameter to 32, 64, 96 or 128



3. Press the NEXT button to select Yes or No.
 - a. Selecting No will bring you back to the main FACTORY DEFAULTS menu.
 - b. Selecting Yes will cause the node to reset and return all parameters to the factory default conditions.
 - c. Selecting RETURN will bring you back to the main FACTORY DEFAULTS menu

Press the SET button to confirm your choice.

6.6 Web Server Sub-Menu

This will allow the enabling/disabling of the G3 Web Server.

Web-Server Steps



1. Press the SET button to enter the Web-Server sub-menu.



2. Press the NEXT button to scroll through the choices to enable or disable the feature.

- a. ENABLED (Factory Default)
- b. DISABLED
- c. RETURN (this will return you to the main menu)

Press the SET button to confirm your choice.



3. Press the NEXT button to select Yes or No to accept the selection.

- a. Selecting No will bring you back to the main menu.
- b. Selecting Yes will take you to the following apply changes menu.

Press the SET button to confirm your choice.



Apply Changes Steps



4. Press the NEXT button to select either NOW or LATER.

- a. Selecting NOW will cause the node to reset and apply the new setting.
- b. Selecting LATER will cause the new setting to be saved in memory, you must accept the saved changes before your next power cycle otherwise they will be lost.

Press the SET button to confirm your choice.



- Factory default setting for WEB-SERVER is enabled.

6.7 MAC Address Sub-Menu



MAC (Machine Access Control) Address

1. The MAC Address is a fixed unique value that cannot be edited.

The actual MAC ADDR has an extra leading zero. The actual number in the example shown is 00-15-24-00-06-69

6.8 Model Number Sub-Menu

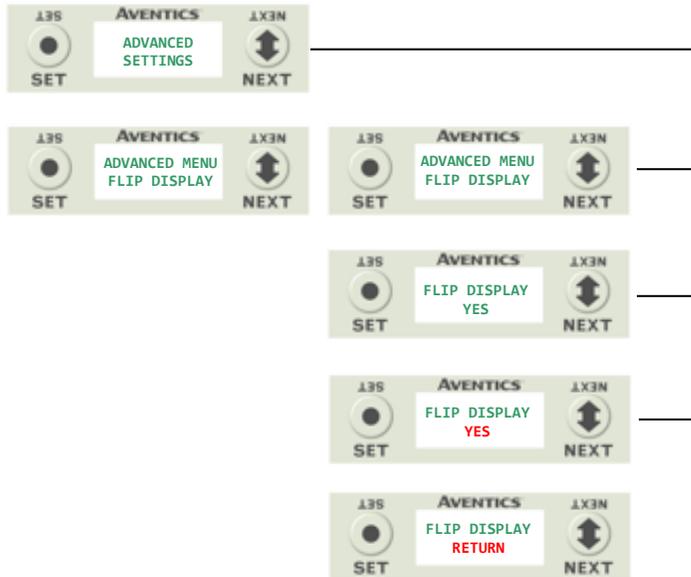


Model Number

1. The Model Number is reference only.

6.9 Advanced Settings – Flip Display

Flip Display Settings



1. Press the SET button to enter the ADVANCED SETTINGS menu.

2. Press the NEXT button to scroll to the CONFIG MENU / FLIP DISPLAY.

Press the SET button to enter the CONFIG MENU / FLIP DISPLAY.

3. The current state of the parameter is shown

4. Press the NEXT button to change this parameter

- a. YES
- b. RETURN

Press the SET button to confirm your choice.



- This a global setting that affects all modules
- Each module, however, has its own setting if different settings are required.

6.10 Advanced Settings – Parameters



PARAMETER Steps

1. Press the SET button to enter the Parameters sub-menu.
2. Press the NEXT button to scroll through the choices to enable or disable the feature.
 - d. UNLOCKED (Factory Default)
 - e. LOCKED
 - f. RETURN (this will return you to the main menu)

Press the SET button to confirm your choice.

By choosing LOCKED, all settable parameters will be read only via the graphic display. UNLOCKED, the factory default, will allow all parameters to be settable through the graphic display.

Please note that all parameters are read only, regardless of this setting, when an IO connection between the communication module and the controller (PLC) is present

3. Press the NEXT button to select Yes or No to accept the selection.
 - c. Selecting No will bring you back to the main menu.
 - d. Selecting Yes will take you to the following apply changes menu.

Press the SET button to confirm your choice.

Apply Changes Steps

4. Press the NEXT button to select either NOW or LATER.
 - c. Selecting NOW will cause the node to reset and apply the new setting.
 - d. Selecting LATER will cause the new setting to be saved in memory, you must accept the saved changes before your next power cycle otherwise they will be lost.

Press the SET button to confirm your choice.

6.11 Factory Defaults Factory Defaults

Factory Default Settings



1. Press the SET button to enter the FACTORY DEFAULTS sub-menu.

2. Press the SET button to change this parameter



3. Press the NEXT button to select Yes or No.
- d. Selecting No will bring you back to the main FACTORY DEFAULTS menu.
 - e. Selecting Yes will cause the node to reset and return all parameters to the factory default conditions.
 - f. Selecting RETUTN will bring you back to the main FACTORY DEFAULTS menu

Press the SET button to confirm your choice.

FACTORY DEFAULT SETTINGS	
Description	Default
Station Name	(Blank)
IP Address	0.0.0.0
Sub Net Mask	255.255.255.0
Gateway Address	0.0.0.0
Fault Action	Reset to All Off
Idle Action	Reset to All Off
Flip Display	Normal
Parameters	Unlocked

6.12 Diagnostics



All diagnostic information is read only

1. Press the SET button to enter DIAGNOSTICS sub-menu.
2. Press the NEXT button to scroll through the main diagnostic menu choices.
 - a. OUTPUT INDICATION
 - i.- Displays the coils actuated. Press NEXT to view the second word of data.
 - b. SET SELF TEST
 - i.- Please see following page for description.
 - c. FIRMWARE REV.
 - i.- For service personnel.
 - d. FIRMWARE BUILD
 - i.- For service personnel.
 - e. LOAD FIRMWARE
 - i.- For service personnel.
 - f. BOOTCODE REV.
 - i.- For service personnel.
 - g. BOOTCODE BUILD
 - i.- For service personnel.



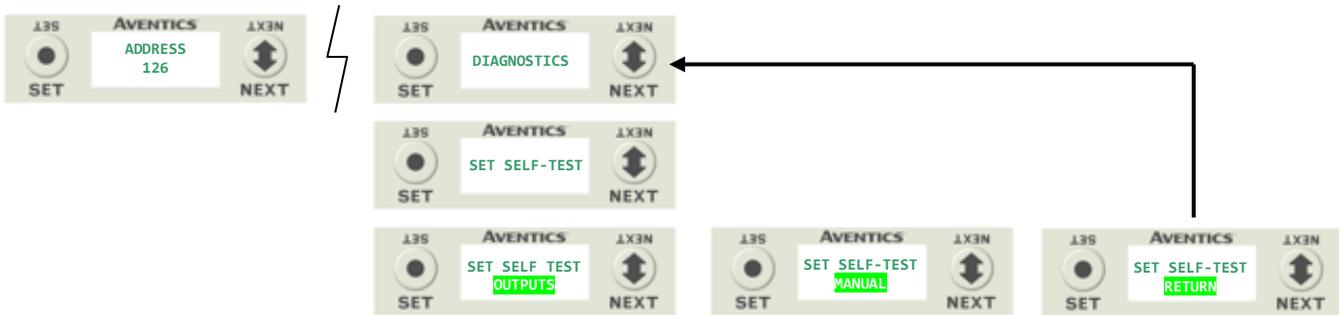
6.14 Diagnostics Self-Test

An internal diagnostic tool can be enabled on the 580 (node) using the graphic display. This tool allows the user to confirm that the manifold outputs (coils) are fully functional without a network connection or controller. There are two test modes that the user can choose. The "OUTPUTS" test mode tests all the outputs by sequentially turning them ON and OFF for approximately .5 seconds. The "MANUAL" test mode will allow the user to manually select one or multiple output (coils) to be energized individually or simultaneously. It will remain energized until the selected output is changed, or the SELF TEST MODE is ended. Cycling power to the Node in either test mode will end the SELF TEST MODE function.

To use the SELF TEST MODE, the user must first set some initial conditions. Follow the steps to initiate the SELF TEST MODE for either "OUTPUTS", or "MANUAL".

Diagnostics - Self Test Mode (continued)

- 1) **Disconnect Air and Communication from the manifold!**
- 2) Select the desired test mode using the graphic display. (See example below)
- 3) Starting at the Home Screen, navigate the menus by selecting the NEXT button until the DIAGNOSTICS menu is shown.
- 4) Select the SET button to access the DIAGNOSTICS menu and then again to access the SELF TEST MODE menu.
- 5) Push NEXT to navigate to the desired test mode: "OUTPUTS" or "MANUAL".
- 6) Push SET to select the desired test mode.
- 7) A message will appear: DISCONNECT AIR HOLD SET BUTTON
- 8) Hold the SET button down for approximately 10 seconds to enable the test. The Display will flash the above message while the button is pushed.
- 9) When the display stops flashing, the SELF TEST MODE will run and the Module Status LED will flash Red/Green while the display identifies the chosen test mode running.



HOLD FOR 10 SECONDS TO INITIATE EITHER MODE



"OUTPUTS"

"MANUAL"

The connected outputs will cycle every 0.5 seconds.



Push to Energize flashing coil output



Push again to De-energize



The first (16) available coils (outputs) will appear. There are a total of (32) coils that can be individually or simultaneously energized.

Press NEXT button to advance to the desired coil to be actuated. The desired coil indicator will **flash**. Press the SET button to turn on the coil, the indicator will go solid. Pressing the SET button again will turn the coil off. If you choose to leave the coil actuated, press the next button and move to the next desired coil. You have the ability to actuate all 32 coils manually. Moving to any coil that is actuated, and pressing the SET button will deactivate the coil. Cycling power to the unit will deactivate the SELF TEST MODE.

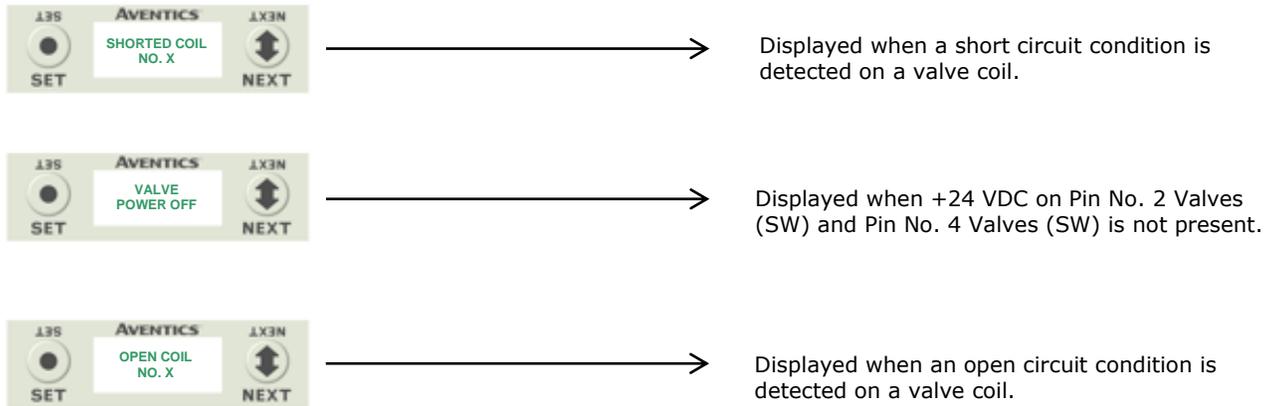
The user can advance quickly through the available coils by pressing and holding the NEXT button for at least 3 seconds.



A Power Cycle is required to Deactivate SELF TEST MODE

6.14 Error Messages

The following are automatic error messages that are displayed when specific faults occur during operation:



7. PROFINET™ Integrated Web Server

7.1 Connecting to an Aventics 580 Profinet™ Node

This section will discuss how to connect a computer to a 580 Profinet™ node. There are multiple ways to complete this task, so only two will be discussed.

1. Connect a 24VDC power supply to the valve manifold. The power pin-out can be found on the side of the node or on page 14 of this document. (Note: 24VDC only needs to be applied to the "+24VDC (NODE)" pins to power the node.)
2. Connect an Ethernet cable directly from the manifold to the computer or to a router, hub, or switch.
3. Turn on the computer. Also, make sure the manifold and the router, hub, or switch has power.
4. To communicate with a 580 Profinet™ manifold the IP address of your computer must be known.
5. Once the IP address for the computer is known, set the IP address of the 580 Aventics manifold using one of the methods described on page 48 .
6. Open a web browser on the computer and type in the IP address of the manifold.
Ex. <http://192.168.3.120>



7. You have successfully connected a computer to a Aventics 580 Profinet™ manifold.

7.2 Using the Functionality of the 580 Profinet™ Web Server

This section will discuss the functionality of the built in Ethernet server. Every Aventics Profinet™ manifold has this feature. Through this server you can configure the node, force outputs (valves), check diagnostics, etc. Each Aventics' web page will be explained.

Home

To get to the Aventics "Home" page, open a web browser. In the URL line, type in the IP address of the manifold and press "Enter". The Aventics "Home" page will appear. This page shows a picture of the Aventics 580 Profinet™ manifold. From this page, the user can navigate the entire built-in web server.



- The 1st three octets of the IP address of the computer **MUST** match the IP address of the node.

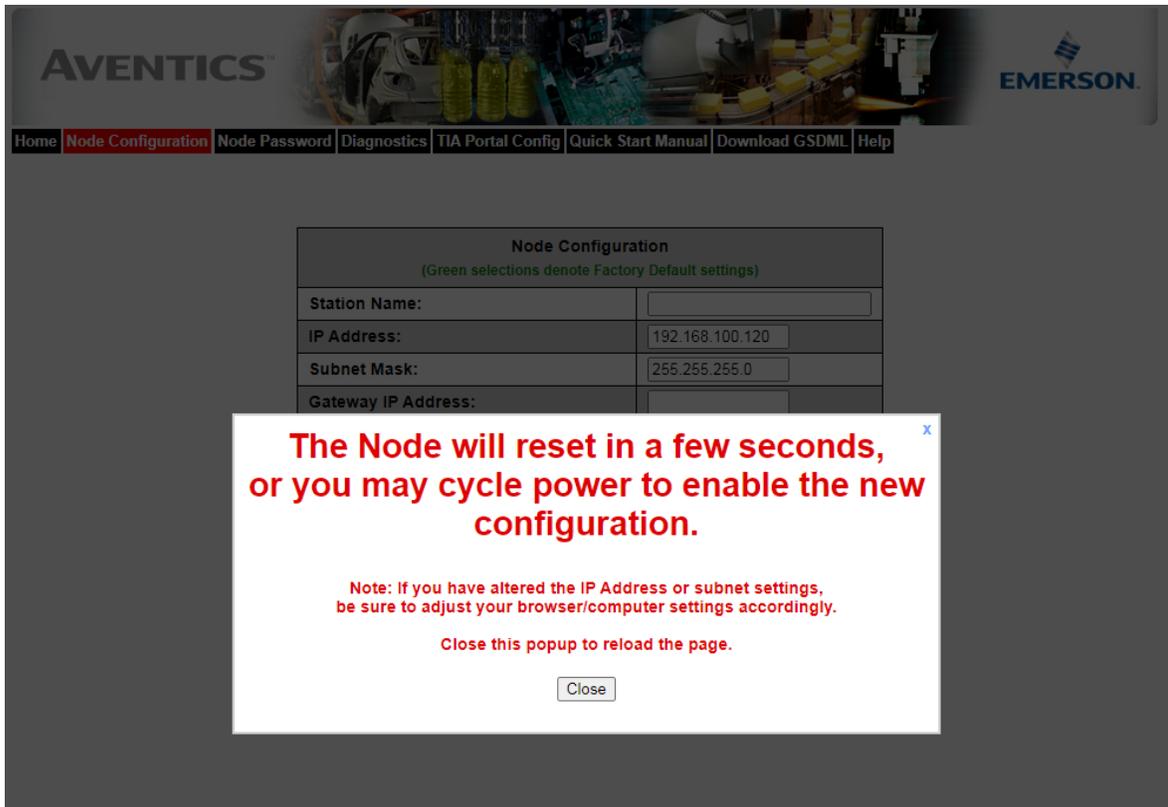
Node Configuration

The "Node Configuration" page allows the user to view and modify the functional parameters of the 580 manifold.



Node Configuration	
(Green selections denote Factory Default settings)	
Station Name:	<input type="text"/>
IP Address:	<input type="text" value="192.168.100.120"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Gateway IP Address:	<input type="text"/>
Web Server:	<input type="text" value="Enabled"/>
Max Coils on Manifold (32 = Standard):	<input type="text" value="32"/>
Node Configuration Parameters:	<input type="text" value="Unlocked"/>
Fast Startup:	<input type="text" value="Disabled"/>
Display Orientation:	<input type="text" value="Normal"/>

Once the changes have been made, left click on the "Update Configuration" button. The following window will appear. The node will reset in a few seconds, or the user may cycle power to enable the new configuration.



Node Password

The "Password" popup window allows the user to set a password that disables forcing outputs or modifying parameters from the 580 Webpage. The password is blank (disabled) by default. To set the initial password, leave the "Enter Current Password" field blank and type in the new password in the "Enter New Password" field.



Change Password	
Enter Current Password: (up to 20 characters)	<input type="text"/>
Enter New Password: (up to 20 characters)	<input type="text"/>
Repeat New Password:	<input type="text"/>

This page allows password protection of the [Node Configuration](#) page and the I/O Force & Test features of the [Diagnostics](#) page. To disable password protection, leave the "Enter New password" box empty. If you have forgotten a previously set password please contact Numatics Technical support.

Once a Password has been set, the protection active popup will request the password.

Module	Part No.	Description	Details	Activity
Node	P580AEPN101	PROFINET 580 Module	<input type="checkbox"/> Show Details	<input type="button" value="Close all Details"/> ✓
Valves		580 Integrated 1-32 Coils Module	<input checked="" type="checkbox"/> Show Details	<input type="button" value="Close all Details"/> ✓

Password protection is active.

Password:

Enter password to make changes or force I/O.



- *If the password has been lost or forgotten, go through the process of changing the password. Enter the last 6 digits of the MAC Address in the current password field and then enter the desired password in the new password field.*

Diagnostics

The "Diagnostics" tab allows the user to monitor the 580-manifold status information. The user may also turn on valve outputs through the "580 Integrated Coils module".



Graphic of module

Reports module status:

- ✓ = OK
- ⚠ = Attention
- ✗ = Lost comm.

Relevant node information including firmware revision

Module	Part No.	Description	Details	Activity																																	
Node	P580AEPN101	PROFINET 580 Module	<input checked="" type="checkbox"/> Show Details	<input checked="" type="checkbox"/> Close all Details																																	
		Firmware Revision: 1.1 Build 44027 Station Name: IP Address: 192.168.100.120 Subnet Mask: 255.255.255.0 Gateway IP Address: 0.0.0.0 Active COMM Link Type: Port 0: 100 Mbps/Full Duplex -- Port 1: Link Down MAC Address: 00-15-24-01-45-bd Active Profinet Connections: 0 Diagnostic Word Status: OK Diagnostic Word Byte 0: 0 1 2 3 4 5 6 7 Bit 0: Switched Power Status Bits 1-7: Not Used Diagnostic Word Byte 1: 0 1 2 3 4 5 6 7 Bits 0-7: Not Used <input type="checkbox"/> Show I/O Mappings and Sizes	<input checked="" type="checkbox"/> Show Details <input type="checkbox"/> Close all Details <input checked="" type="checkbox"/>																																		
		Firmware Revision: 1.1 Valve Coils 0-31: Check/Uncheck box to force/un-force valve coil Valve Status: ● = Shorted Coil ● = Open Coil ✗ = No Coil Detected	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr> <tr><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr> </table>			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	1	2	3	4	5	6	7																														
8	9	10	11	12	13	14	15																														
16	17	18	19	20	21	22	23																														
24	25	26	27	28	29	30	31																														
		<input type="checkbox"/> Show I/O Mappings and Sizes	<input type="checkbox"/> Show Error/Event Log																																		

Switched power status bit 0

Error / Event Log:

Keeps a running count of 50 events. First in First out (FIFO)

Event Number	Boot Count	Relative Time (HH:MM:SS.SS)	Description	User Comment	Clear Log
1	1	00:25:47.75	Log cleared		<input type="button" value="Clear Log"/>
2	1	00:25:54.12	Valve power off		<input type="button" value="Add Comment"/>
3	1	00:25:54.22	Valve power restored		<input type="button" value="Add Comment"/>
4	1	00:25:54.77	Valve power off		<input type="button" value="Add Comment"/>
5	1	00:25:54.82	Valve power restored		<input type="button" value="Add Comment"/>
6	1	00:25:55.37	Valve power off		<input type="button" value="Add Comment"/>
7	1	00:25:56.65	Valve power restored		<input type="button" value="Add Comment"/>
8	2	00:00:00.14	Reboot - build 41698		<input type="button" value="Add Comment"/>

Allows user to clear log

Allows user to add comments

Reboot events are shown in red

TIA Portal Software Config

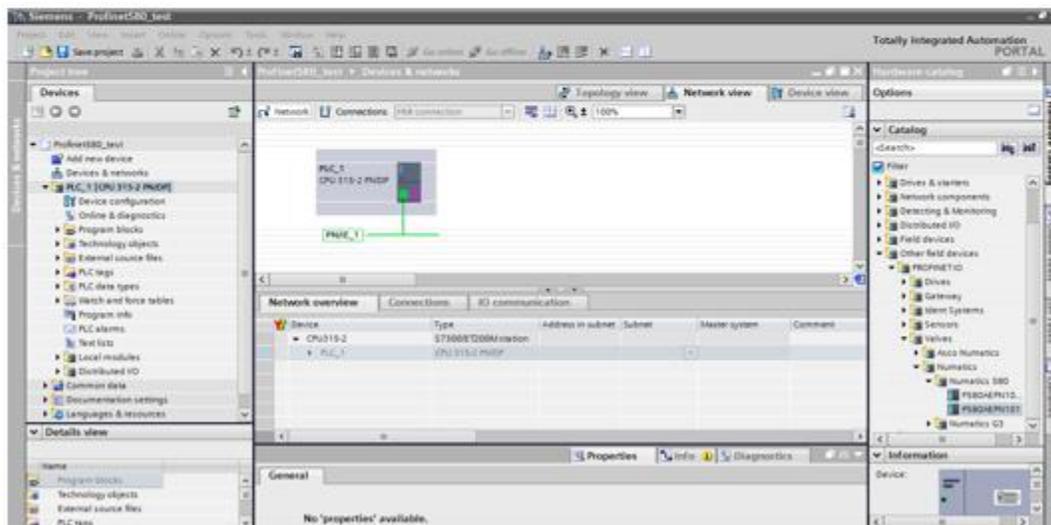
The "TIA Portal Config" tab provides a guide describing how to add the 580 Profinet™ manifold to a Siemens PLC configuration. See "580 Profinet™ Configuration" page 51 for more information.



Commissioning 580 Profinet with Siemens TIA Portal Software

Follow your Siemens software help guide to install the 580 PROFINET GSDML file (Latest GSDML files are available at fieldbus.asco.com). Once the GSDML file is installed select the various components to assemble your 580 manifold configuration and I/O map.

From the "Project Tree" (left panel) double click "Devices and networks".



If you do not have access to the node web server, see page 46 for commissioning of a 580 PROFINET™ node/manifold using Siemens TIA Portal Software.

Quick Start Manual

The Quick Start Manual tab accesses the embedded Quick Start Manual in the node. This is a condensed version of the complete Technical Manual that can be downloaded from <https://fieldbus.asco.com/>. It provides the basic information for the user to connect and configure the 580 EtherNet/IP™ DLR Node and Manifold.

Download GSDML

The "Download GSDML" tab provides links to download the embedded GSDML file stored in the node or to connect with the Aventics website.



[Download embedded GSDML & ICON files](#)

[Download web based GSDML & ICON files](#)

Aventics.com

The "Aventics.com" tab is a quick link to Aventics' website. The computer must have internet access for this tab to be functional.

7.3 Station Name and IP Address Configuration

The IP address of the Aventics 580 Profinet node may be configured via several different methods:

- Step 7 software configuration
- Graphical display

Integrated Web Page Configuration Tab

Station name, IP address, Subnet Mask and Gateway address parameter selections can all be configured from this page. These parameters will be programmed in the node's non-volatile FLASH memory once "Update Configuration" is clicked, and power to the node is cycled.



Node Configuration	
(Green selections denote Factory Default settings)	
Station Name:	<input type="text"/>
IP Address:	<input type="text" value="192.168.100.120"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Gateway IP Address:	<input type="text"/>
Web Server:	<input type="text" value="Enabled"/> ▼
Max Coils on Manifold (32 = Standard):	<input type="text" value="32"/> ▼
Node Configuration Parameters:	<input type="text" value="Unlocked"/> ▼
Fast Startup:	<input type="text" value="Disabled"/> ▼
Display Orientation:	<input type="text" value="Normal"/> ▼

IP address configuration-Graphic Display

See page 29 "Steps for Setting IP Address"



- *The Ethernet/IP™ node will reset in a few seconds, or the user may cycle power to enable the new configuration.*

7.4 User Configurable Device Parameters

The Aventics 580 PROFINET™ node allows the user to set many user options which define how the manifold behaves in certain instances. The following are descriptions of these device parameters.

<i>Name</i>	<i>Description</i>	<i>Settable Via</i>		
		<i>Display</i>	<i>Web Server</i>	<i>PLC GSD</i>
IP Address	Node address	✓	✓	X
Output (Valve) Idle/Fault Action	Determines whether to use idle value attribute or hold last state	X	X	✓
Fast Startup	Application specific for fast PLC connection time after a Profinet™ node power cycle	✓	X	✓

7.5 Communication Fault/Idle Mode Parameter

This parameter is used to describe characteristics or behaviors of output points. The parameter shown below is used to determine what state the outputs of a particular G3 output module will have during an “Idle” event or a “Fault” event.

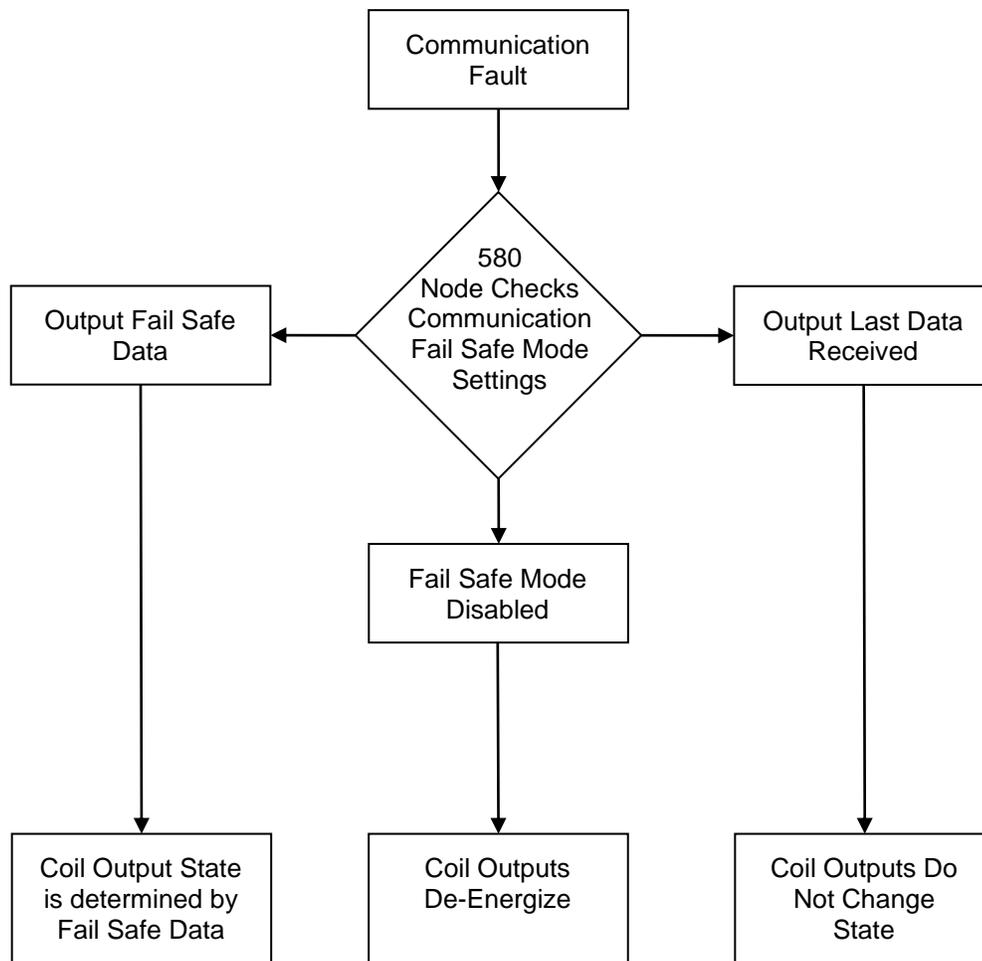
The user, through GSD configurable parameters within the PLC configuration for each output module determines how the outputs behave when a communication fault or idle actions occurs. These settings are non-volatile and thus will not change upon loss of power.

The three behavior options are:

1. Turn Off All Outputs
2. Hold Last State
3. Output a Specific Byte Value

The process for determining the output state during a Communication Fault/Idle Mode is as follows:

1. The device receives a Communication Fault/Idle Mode event.
2. The device determines what action to take based on the Communication Fault/Idle Mode attribute setting (see flow chart).



8. 580 Profinet™ Commissioning

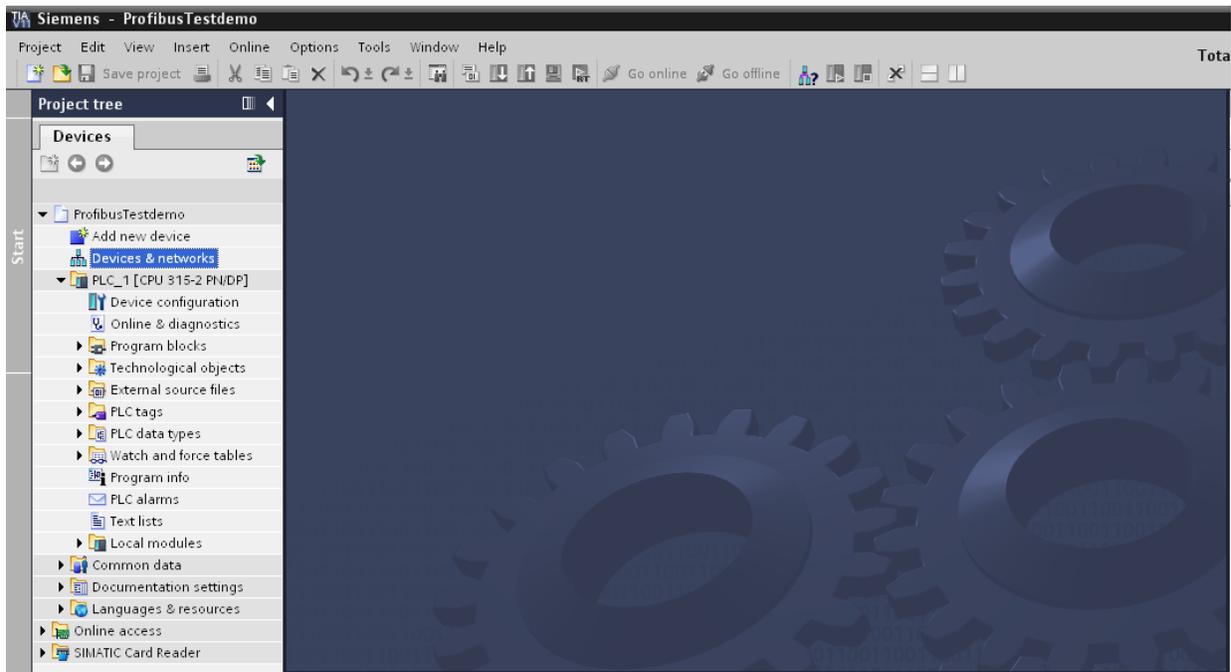
8.1 GSDML File

The GSDML file contains configuration information required to establish communication to a node on a PROFINET™ network. The GSDML file is available on the Aventics website at <https://fieldbus.asco.com/>.

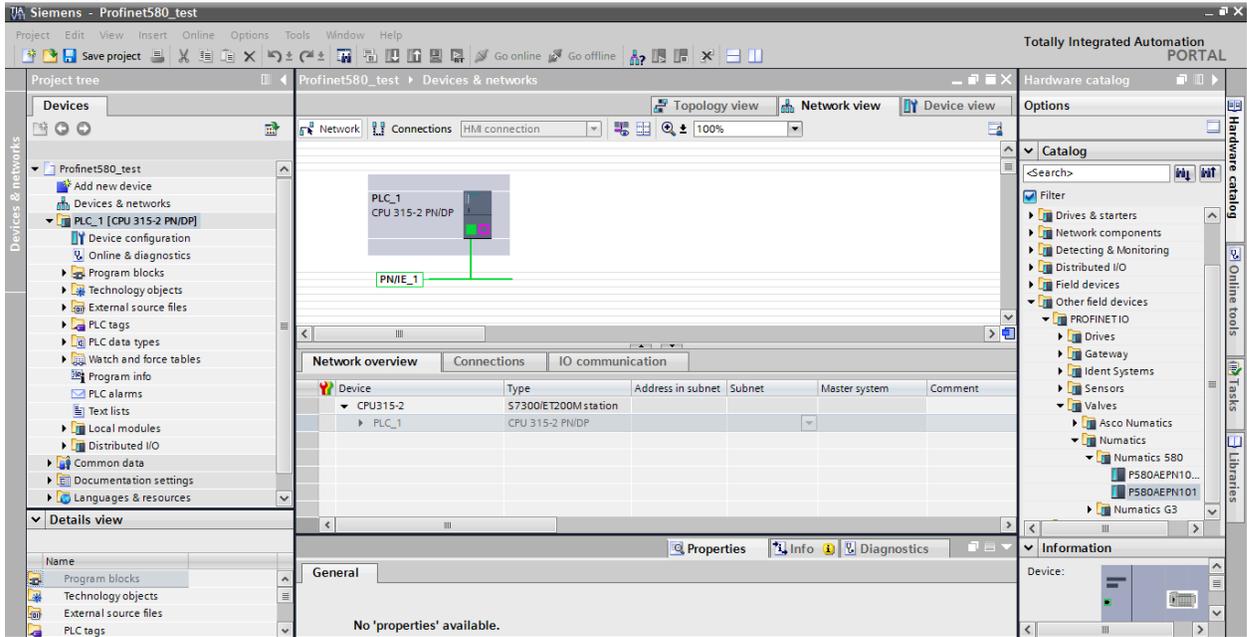
8.2 580 Profinet™ PLC Configuration

Follow your Siemens software help guide to install the 580 PROFINET™ GSDML file (Latest GSDML files are available at <https://fieldbus.asco.com/>). Once the GSDML file is installed select the various components to assemble your 580 manifold configuration and I/O map.

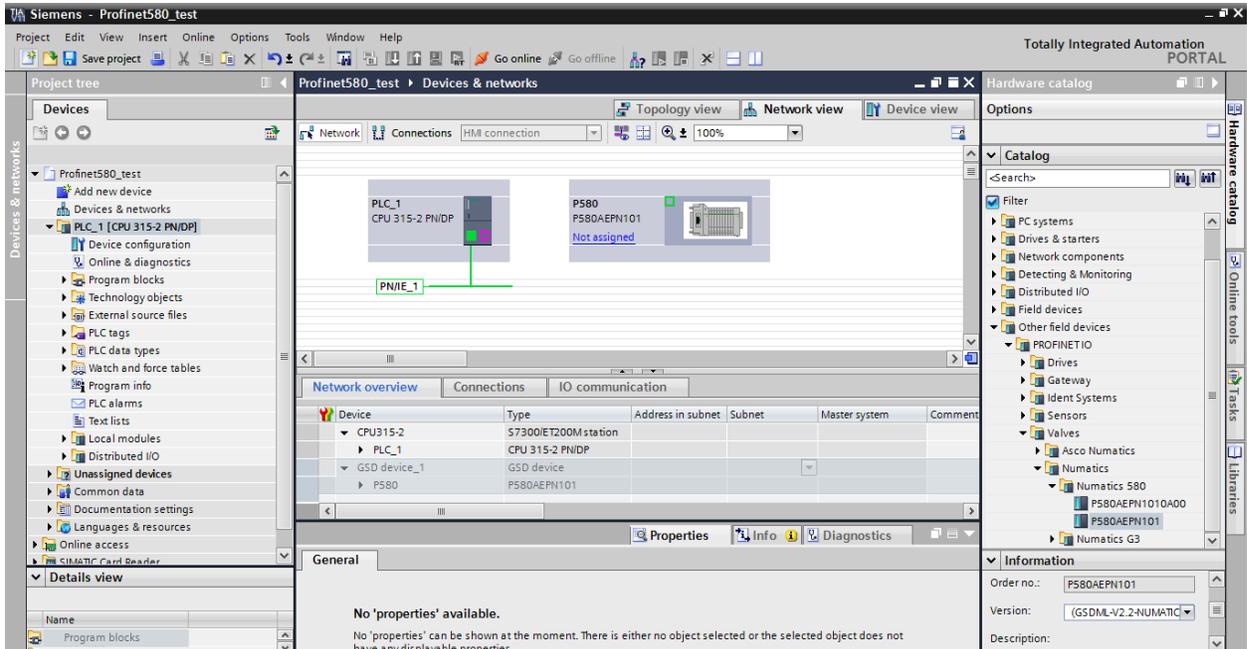
From the "Project Tree" (left panel) double click "Devices and networks"



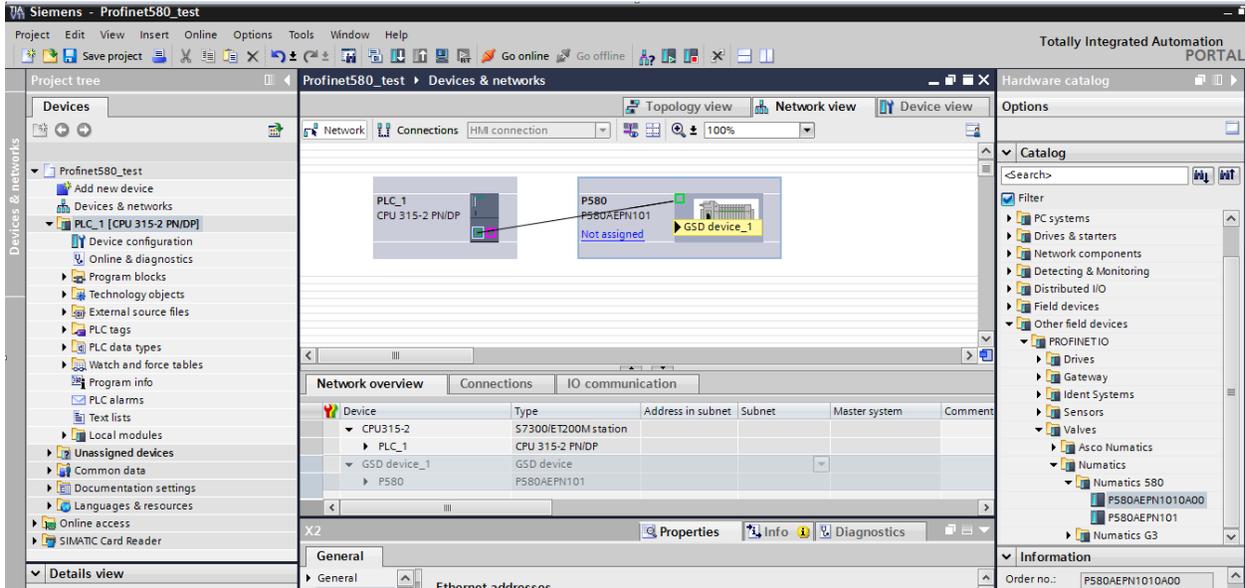
From the "Hardware catalog" other field devices expand;
 PROFINET™ IO\Valves\Numatics\580. Then double click 580



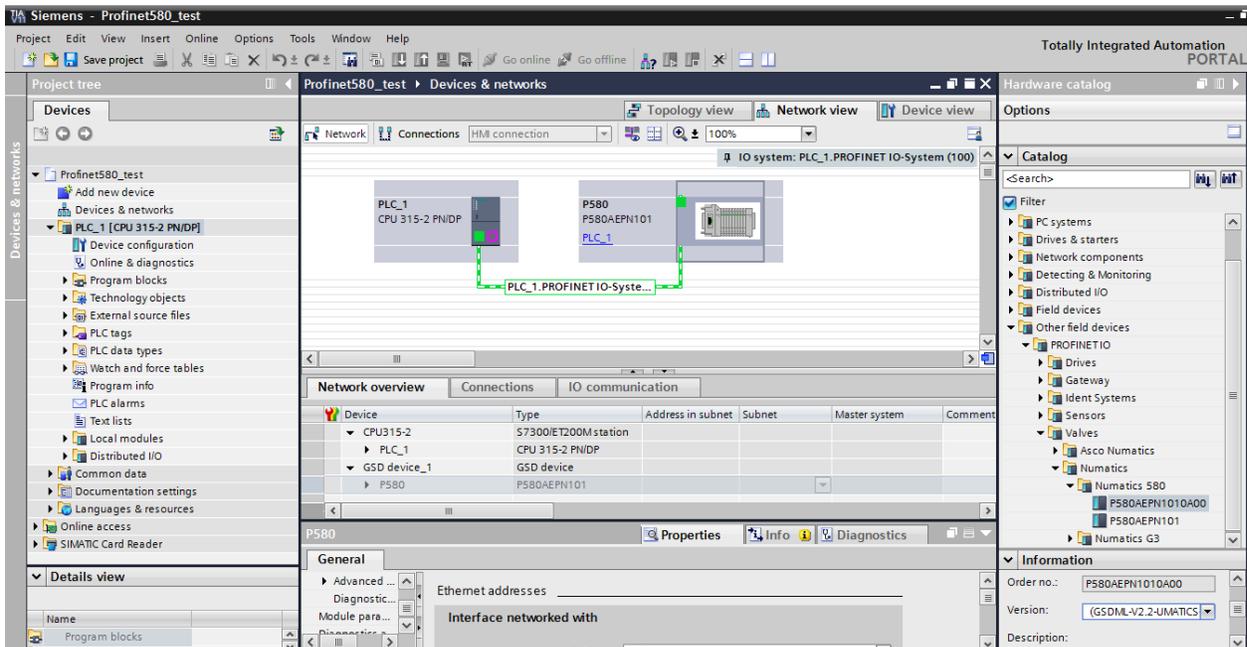
The 580 is added to the "Devices and networks" configuration



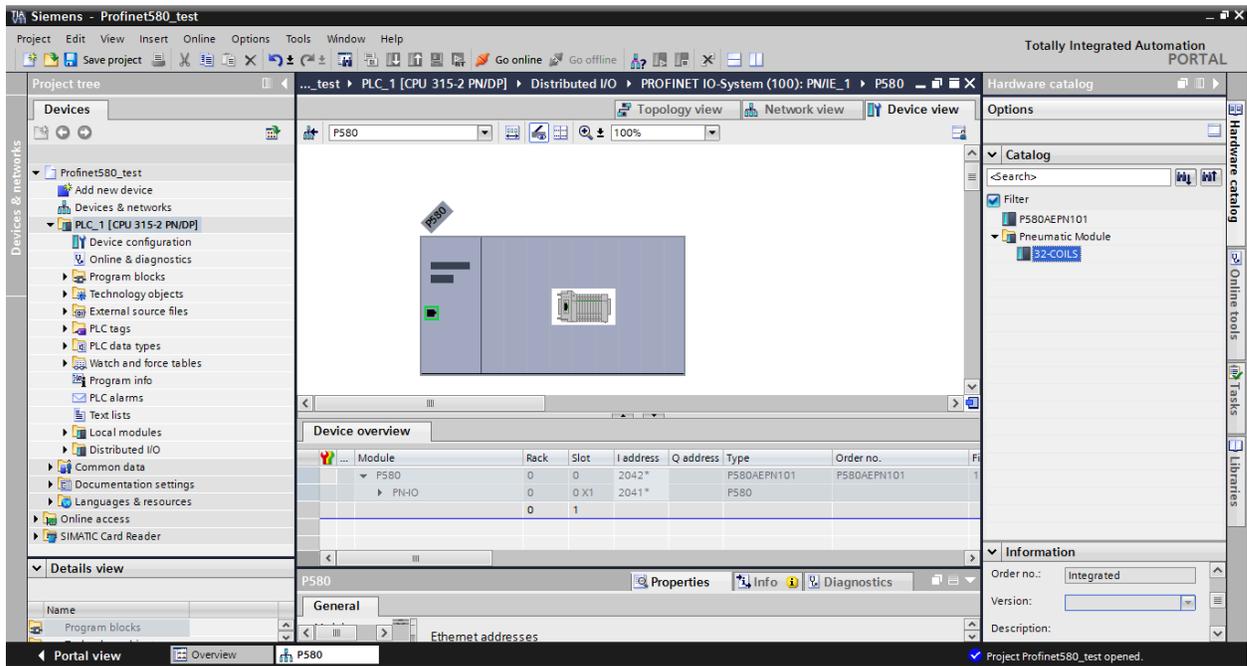
Select the Profinet port of the PLC then drag a line to Profinet port of the 580.



The 580 Manifold is connected and assigned to PLC_1. Double click the 580 Manifold to begin I/O configuration.



The 580 Manifold is expanded to show the I/O map. Select from the hardware catalog (right tab) and select "32-COILS". Then save the configuration and download to the PLC



8.3 580 Profinet™ Station Name

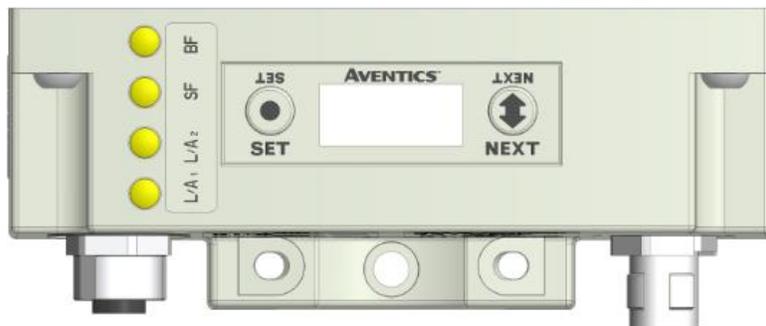
The Aventics 580 manifold requires a station name that associates it to the Siemens Profinet™ PLC configuration. When the PLC recognizes the 580's "Station Name" as a match to a configured station in the PLC's Profinet™ network configuration, the PLC writes the configured IP address, Subnet mask and Gateway address to the 580 node then establishes Profinet™ network communication.

The 580-manifold station name is configured through the 580 Integrated Web Server.



Node Configuration	
(Green selections denote Factory Default settings)	
Station Name:	Aventics580
IP Address:	192.168.100.120
Subnet Mask:	255.255.255.0
Gateway IP Address:	
Web Server:	Enabled
Max Coils on Manifold (32 = Standard):	32
Node Configuration Parameters:	Unlocked
Fast Startup:	Disabled
Display Orientation:	Normal

Update Configuration



9. PROFINET™ Mapping

9.1 I/O Sizes

Outputs (Valves)

Outputs are defined as any valve solenoid coil attached. The valves size is set at (32) bits, 4 bytes of output data and is non-settable.

9.2 Bit Mapping Rules

The bit mapping for a 580 PROFINET™ manifold remains similar, the only variation depends on whether a single of a double solenoid valve is used. The following is a breakdown of the bit mapping rules associated with the Aventics 580 Valve Manifold.

- 1) Solenoid coil outputs are connected to the valve coils using the Z-Boards™.
- 2) The valve size is fixed at 4 bytes (32 coils).
- 3) Solenoid coil output addressing begins at the 1st manifold station nearest the node using "14" coil 1st and then, if applicable, the "12" coil, and continues in ascending order away from the communication node.
- 4) Each manifold station allocates 1 or 2 output bits. This is dependent on the Z-Board™ type installed. A single Z-Board™ allocates 1 output bit. A double Z-Board™ allocates 2 output bits.
- 5) Z-Boards™ can be used in any arrangement (all singles, all doubles, or any combination). Per station selection is limited based on the fact that 502 and 503 manifolds are a minimum of two stations, and the 501 is a minimum of four stations.



Single solenoid valves can be used with double Z-Boards™. However, one of the two available outputs will remain unused. Refer to the Mapping Examples on the following pages.

9.3 Mapping Example No. 1

Assumed Settings

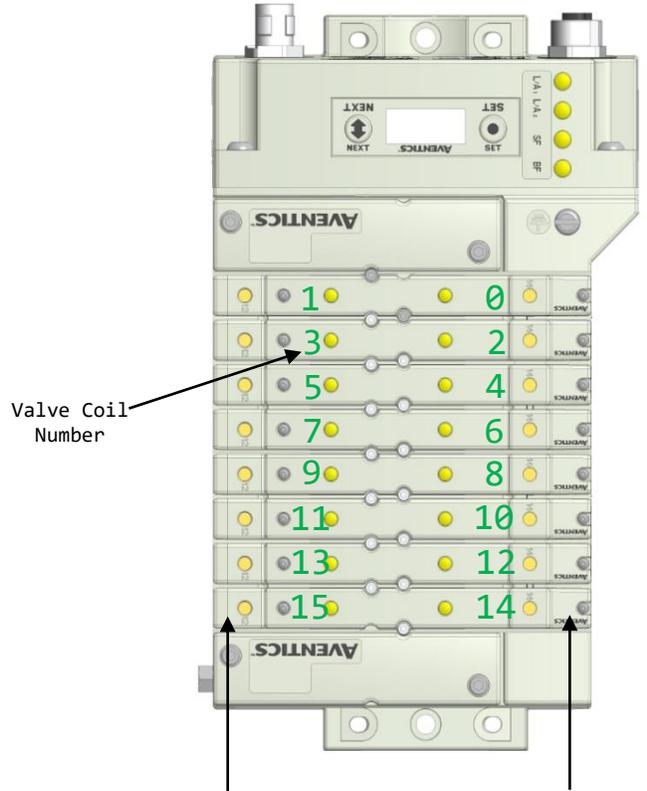
- All double solenoid valves
- Double Z-Boards™, stations 1-8
- 32 coils (4 Bytes) allocated (non-settable)

Manifold I/O Configuration

Description	In	Out
	Bytes	
Local Valve Size:	0	4
Total:	0	4

How to Order

Qty	Part Number
1	8501AV8H100VA00
4	R501A2B40MA00F1
1	H501AMM4BMA0010
4	R501A2B40MA00F1
1	H501AMM4BMA0010
1	P580AEPN1010A00
	ASSEMBLED



When the 12 End Solenoid is energized, the 2 port is pressurized

When the 14 End Solenoid is energized, the 4 port is pressurized

Output Table								
BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Valve Coil No. 7	Valve Coil No. 6	Valve Coil No. 5	Valve Coil No. 4	Valve Coil No. 3	Valve Coil No. 2	Valve Coil No. 1	Valve Coil No. 0
1	Valve Coil No. 15	Valve Coil No. 14	Valve Coil No. 13	Valve Coil No. 12	Valve Coil No. 11	Valve Coil No. 10	Valve Coil No. 9	Valve Coil No. 8
2	Allocated and Reserved							
3	Allocated and Reserved							

9.4 Mapping Example No. 2

Assumed Settings

- All single solenoid valves
- Double Z-Boards™, stations 1-8
- 32 coils (4 Bytes) allocated (non-settable)

Manifold I/O Configuration

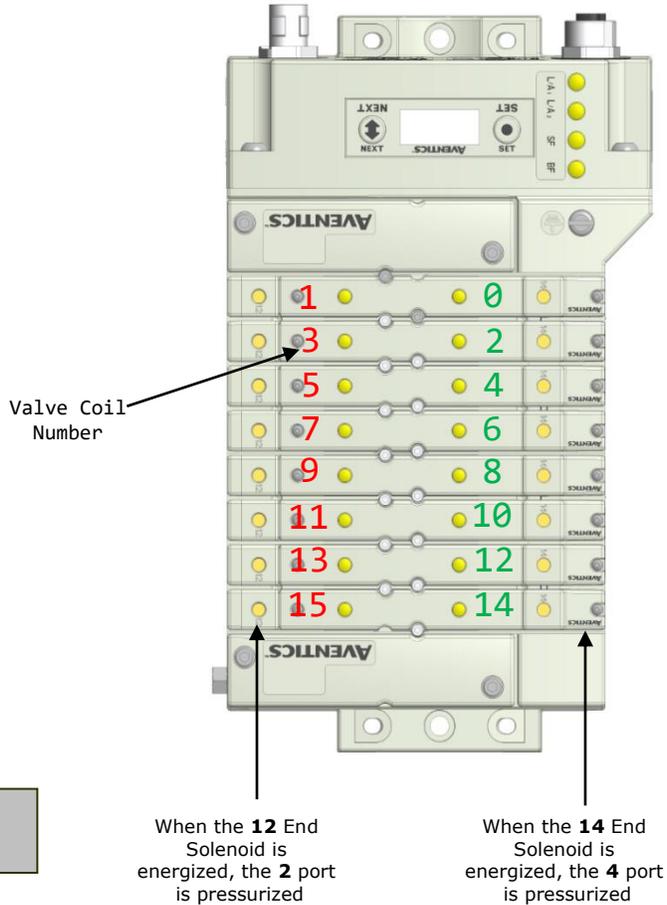
Description	In	Out
	Bytes	
Local Valve Size:	0	4
Total:	0	4

How to Order

Qty	Part Number
1	8501AV8H100VA00
4	R501A2B10MA00F1
1	H501AMM4BMA0010
4	R501A2B10MA00F1
1	H501AMM4BMA0010
1	P580AEPN1010A00
	ASSEMBLED



Coils identified in **RED** are allocated and reserved; refer to mapping table below.



Output Table								
BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Allocated and Reserved	Valve Coil No. 6	Allocated and Reserved	Valve Coil No. 4	Allocated and Reserved	Valve Coil No. 2	Allocated and Reserved	Valve Coil No. 0
1	Allocated and Reserved	Valve Coil No. 14	Allocated and Reserved	Valve Coil No. 12	Allocated and Reserved	Valve Coil No. 10	Allocated and Reserved	Valve Coil No. 8
2	Allocated and Reserved							
3	Allocated and Reserved							

10. Appendix

10.1 System Specifications

<i>ELECTRICAL</i>	
Supply Voltage	Valves (501, 502 and 503): 24 VDC + 10%, -15% Node: 24 VDC ± 10%
Current	Total current on the Auxiliary Power Connector ("Valves" and "Node" Pins) must not exceed 4 Amps.
Internal Electronic Resettable Fuses	The Power Connector pins are each internally fused with an electronically resettable fuse. These fuses are set to the maximum current allowable through the G3electronics.
Recommended External Fuse	External fuses should be chosen depending upon manifold configuration. Please refer to power consumption chart on page 19 for additional fuse sizing information.
Spike Suppression	Output spike suppression is internally provided for both discrete and valve outputs.
Valve Solenoid Coil Output Drivers	Maximum 0.5 Amps per output. All output points are short circuit protected and have internal spike suppression.
Operating Temperature for Electronic Components	-10° to 115°F (-23° to 46°C)

10.2 Factory Default Settings

<i>FACTORY DEFAULT SETTINGS</i>	
<i>Description</i>	<i>Default</i>
Station Name	Blank
IP Address	0.0.0.0
Sub Net Mask	0.0.0.0
Gateway Address	0.0.0.0
Config Mode	32 Coils
Flip Display	Normal
Parameters	Unlocked

10.3 Troubleshooting

Communication Node

<i>Symptom</i>	<i>Possible Cause</i>	<i>Solution</i>
The wrong valve solenoid coils are being energized.	Z-Board™ type mismatch. Single Z-Board™ present where double Z-Board™ expected or vice versa.	Check that correct Z-Board™ types are installed. See page 56 for bit mapping rules.
Valve outputs do not energize.	Output power not present or connected improperly on Auxiliary Power connector.	Check for 24VDC on the +24 VDC Valves pin of the Power connector of the Comm. module.

10.4 Glossary of Terms

The following is a list and description of common terms and symbols used throughout this document:

Term	Description
Auto-Baud	A technology that enables the communication node to automatically set its own baud rate to match the PLC.
Bit	Smallest unit of digital information either a "0" or "1".
Bit mapping	Chart showing which bit is connected to which physical input or output point.
Byte	8 bits (1/2 word).
Ground	This term is used to indicate an earth ground.
NEMA	National Electrical Manufacturers Association.
Sinking (NPN)	Method of connecting electrical circuits in which the zero (0) volt DC side is switched and the common is positive
SCP	Short Circuit Protection
Sourcing (PNP)	Method of connecting electrical circuits in which the positive side is switched and the common is zero (0) volts DC.
Word	2 Bytes (16 bits)
Z-Board™	Circuit board installed in the valve sub-base which electrically connects the valve solenoid to the electronics interface. Available in single or double solenoid versions.

Technical Support

For technical support, contact your local Aventics distributor. If further information is required, please call Aventics Technical Support Department at (248) 596-3337.

Issues relating to network setup, PLC programming, sequencing, software related functions, etc. should be handled with the appropriate product vendor.

Information on device files, technical manuals, local distributors, and other Aventics products and support issues can be found on the Aventics. WEB site at <http://www.Emerson.com>