

# AVENTICS™

## 580 Powerlink™ Technical Manual

ETHERNET   
**POWERLINK**



## 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.**

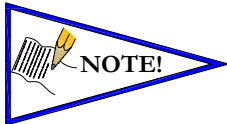
## Safety Precautions

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.

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# 1. About POWERLINK™

## 1.1 Overview

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

The Ethernet POWERLINK™ Standardization Group or EPSG develops and promotes POWERLINK™ technology.

POWERLINK™ uses industrial M12 IP67-rated connectors. The protocol transfers data at a fixed speed of 100 Mbps. The maximum network cabling distance is limited to 100m segments at 20° C.

More information about POWERLINK™ can be obtained at the web site <http://www.ethernet-powerlink.org>.

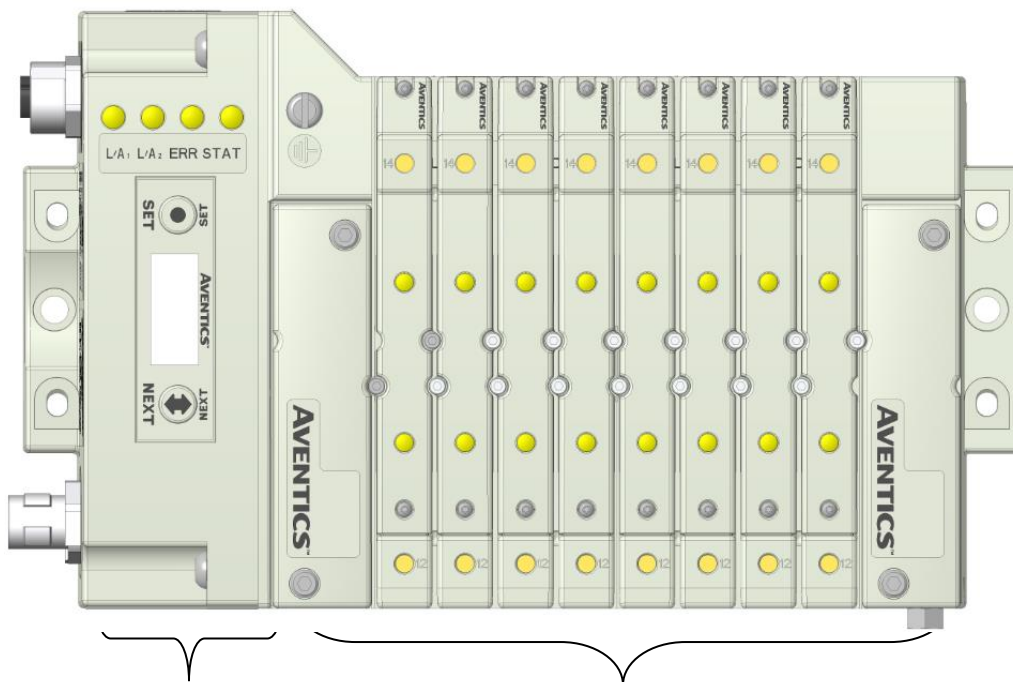
## 1.2 580 POWERLINK™ Features

<i>Features</i>	<i>Description</i>
Spec. Supported	Designed by the Ethernet POWERLINK™ Standardization Group (EPSG)
Bus Topology	Star, Tree, Ring or Daisy Chain
Baud Rates Supported	100 Mbps
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
Conformance Tested	EPSG proof of conformity

## 2. 580 POWERLINK™ Introduction

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

This manual describes specific information for configuring and commissioning the Aventics 580 POWERLINK™ Node. For more information relating to pneumatic valves and valve manifold assemblies, please refer to the Aventics *501 and 503 Series catalogs* at <http://www.Emerson.com>.

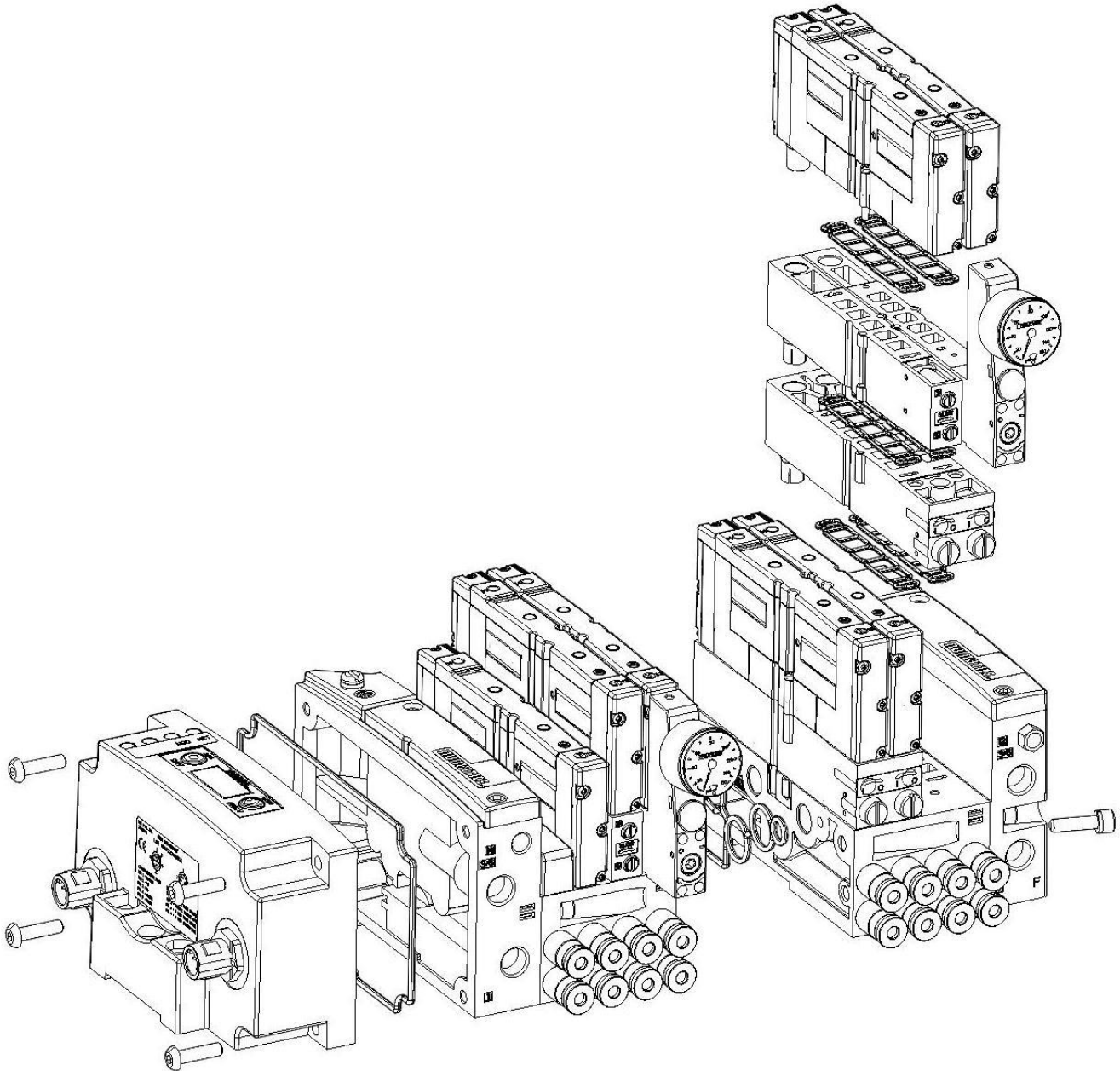


**580 POWERLINK Node**

**Valve Side**  
*Drives up to 32 coils*

## 2.1 Pneumatic Valve Manifold – 501 Series shown

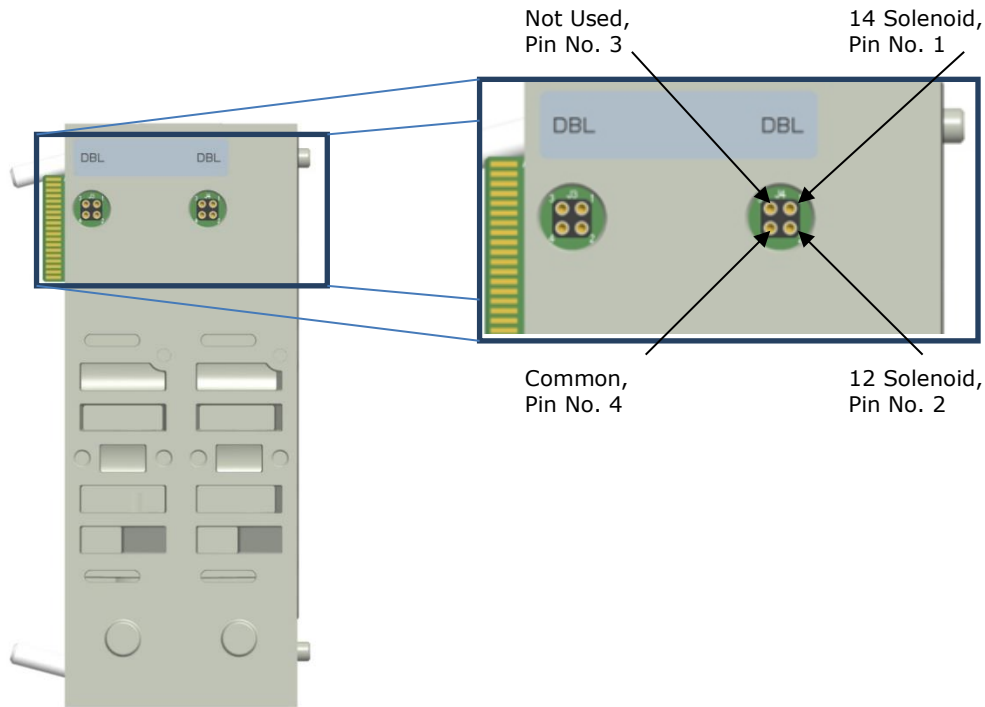
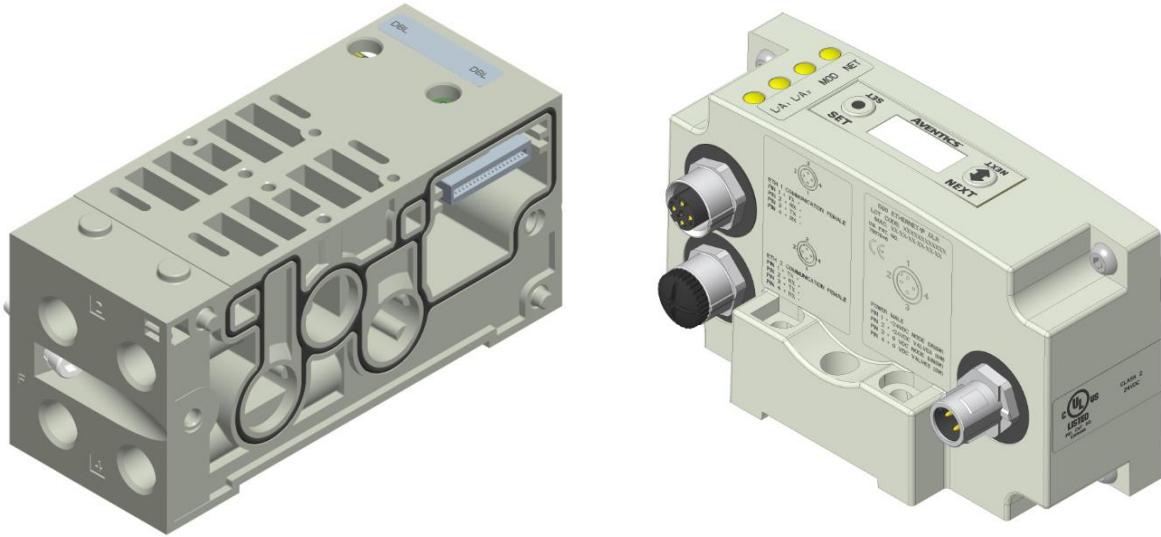
The pneumatic valve manifold with internal circuit board technology is modular. The valve solenoid coil connections are automatically made using Z-Board™ technology (plug together PC boards, which allow internal connection from solenoid coils to output drivers without the use of wires). This allows easy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



## 2.2 500 Series Manifold Stations

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

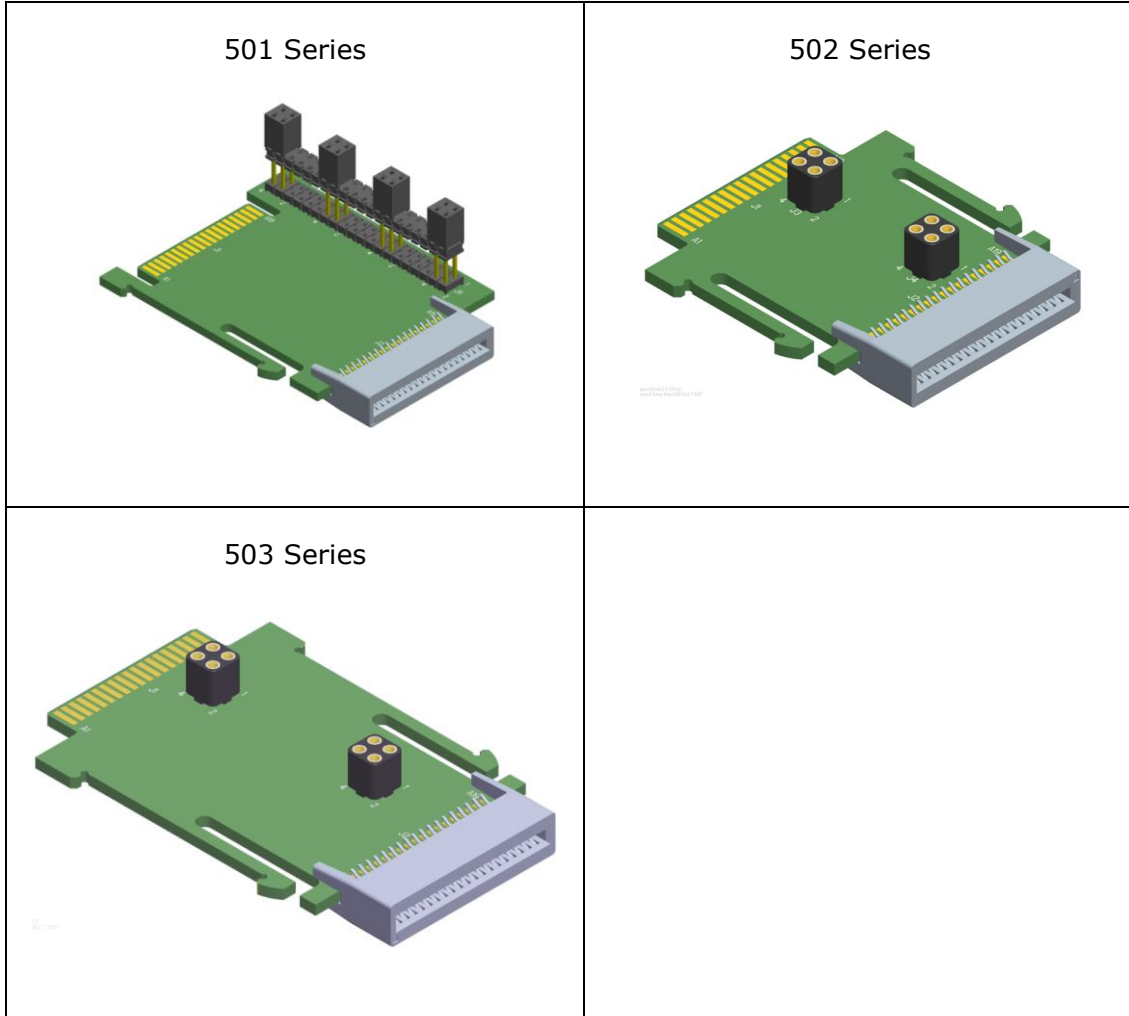
Z-Board™ plug together technology connects all valve solenoids to the valve coil output driver board, located in the valve adapter. There is a maximum of 128 coil outputs available on the complete manifold assemblies. The 128 available outputs are accessed on the 501 series valves utilizing 4 station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

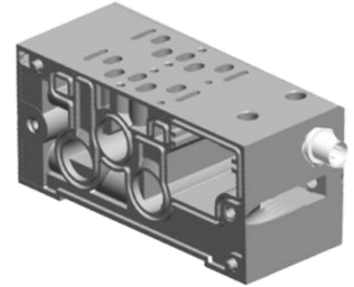
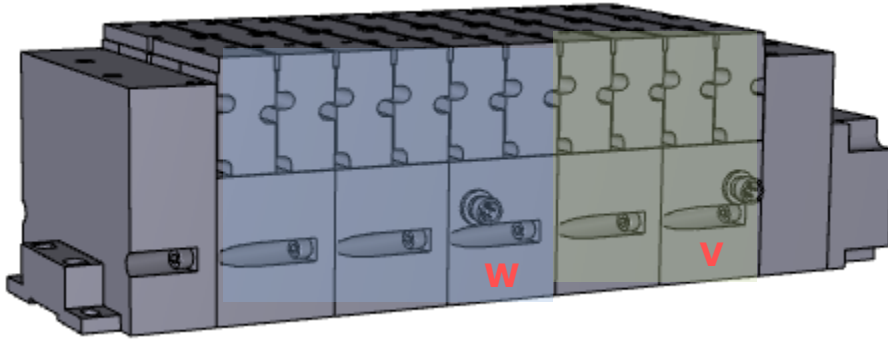


*Each series Z-Board™ can be selected in either SINGLE or DOUBLE output (coil) versions. The SINGLE and DOUBLE output function cannot be mixed on the Z-Boards™*

## 3. Zoned Power

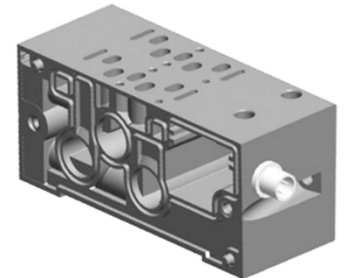
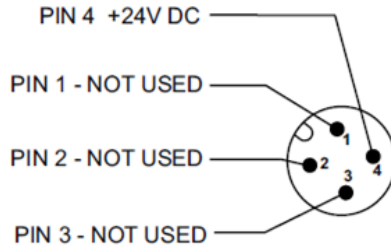
### 3.1 503 Series Zoned Power application

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**

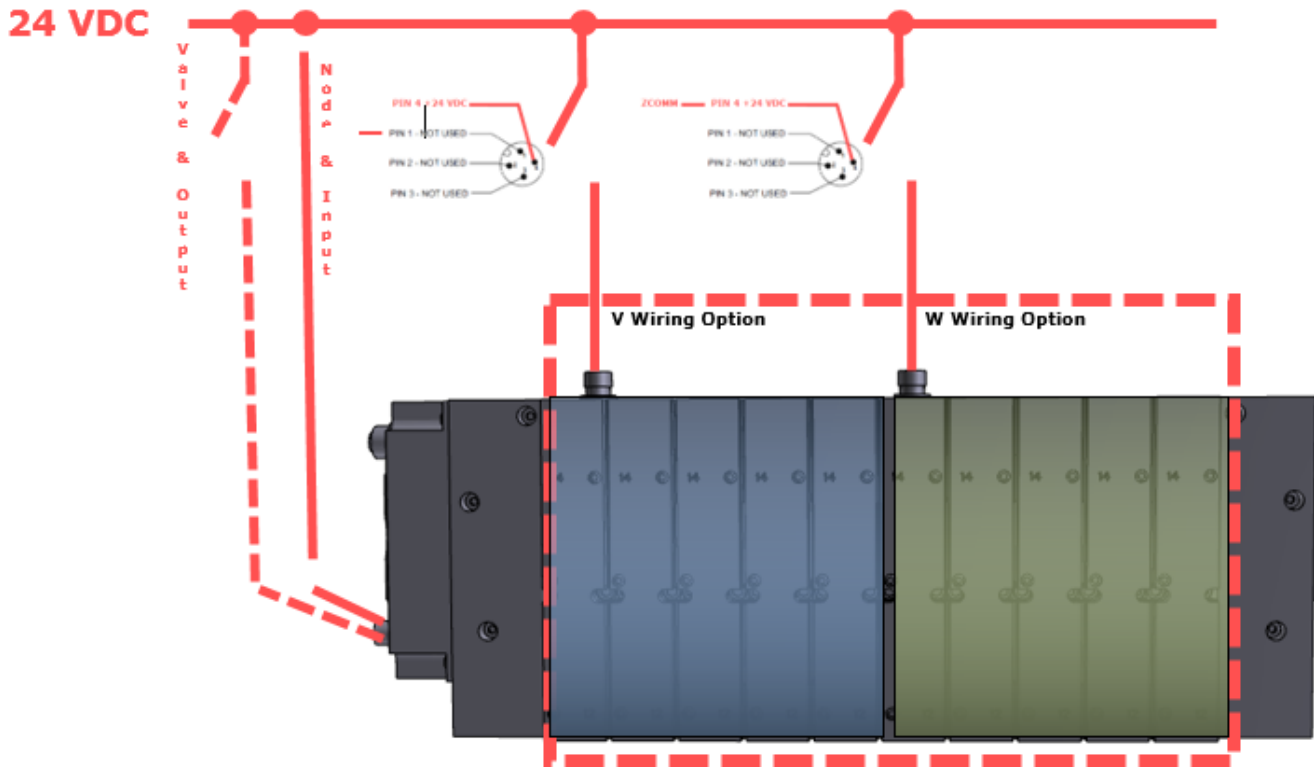
Technical Data

### 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)

## 3.2 503 Series Zoned Power example

In the example shown below there are two Zoned Power Manifold blocks used. One is a "W" wiring option and the other is a "V" 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.



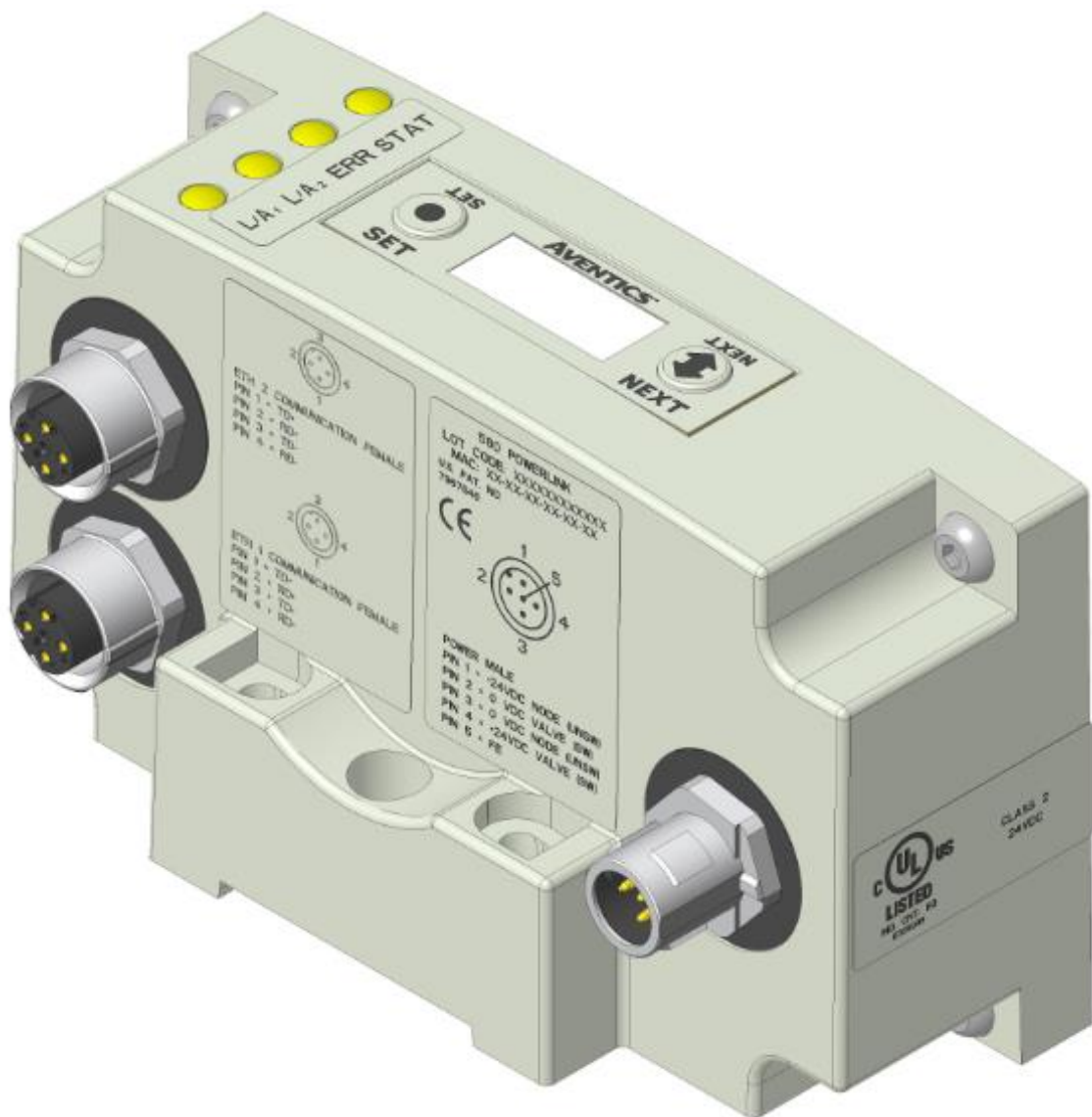
The 0 VDC reference for the +24 VDC applied to Pin 4 of the M12 connector **MUST** be the same as the one used on G3/580/Terminal Strip/25 or 37 Pin Sub-D/19 or 26 Pin Round Connector. If multiple 24 VDC power supplies are used the 0 VDC references of each supply **MUST** be common.

## 4. Communication Module

### 4.1 580 POWERLINK™ Node

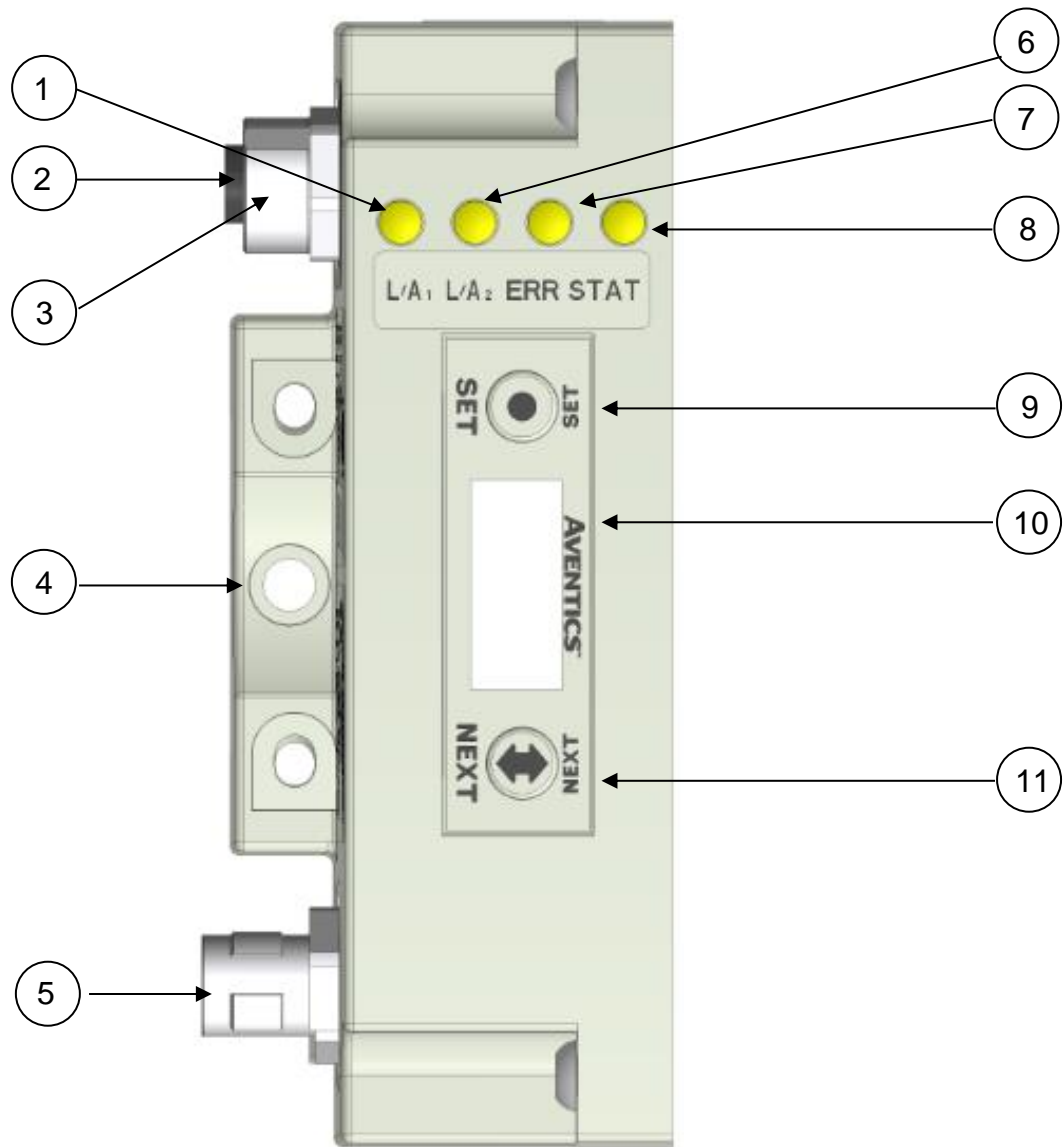
This module is the communication interface to the manifold. It contains communication electronics and internal short circuit protection for power. It can be configured via the graphic display or via software

Communication Interface	Part Number
580 POWERLINK™ Node	P580AEPL1010A00
580 POWERLINK™ Node w/DIN Rail	P580AEPL1010DRM



### 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	ERR LED
8	STAT 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

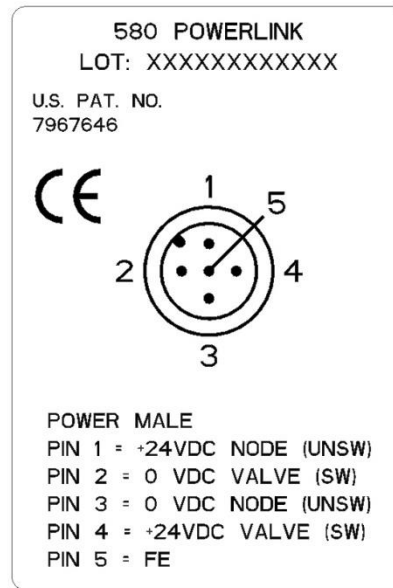
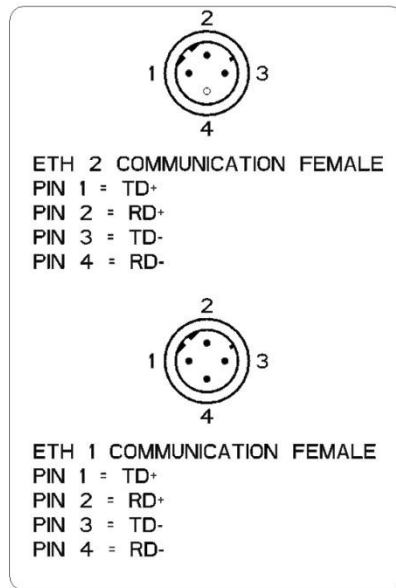
Industry standard connectors are used for communication and power. The POWERLINK™ communication connectors are (2) M12 D-Coded 4 pin female connectors. The Power connector is an M12 5 pin male connector.

### POWERLINK™ 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

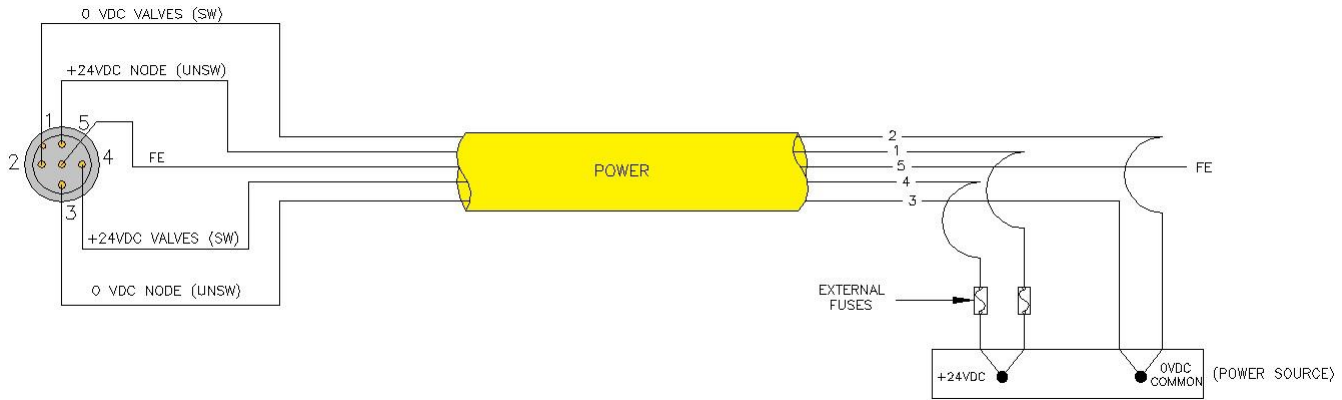


- Power common (0 VDC) pins 2 and 3 are isolated from each other to allow separate (isolated) power supply connection if required. However, they can be connected together if a single common, non-isolated, application is preferred.
- The current draw of the +24VDC Valves (Pin 4) and +24VDC Node (Pin 1), 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

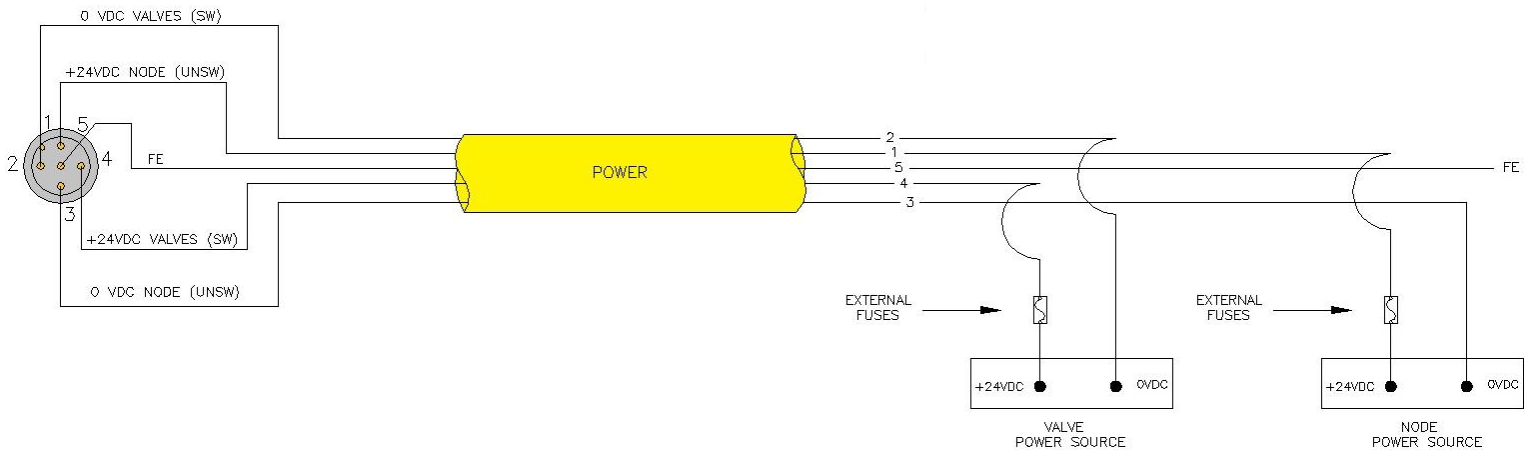
## 4.4 Electrical Connections

### Standard Power Connector Wiring Diagram Examples

#### Single Power Supply Example (Non-isolated commons)



#### Separate Power Supply Example (Isolated commons)

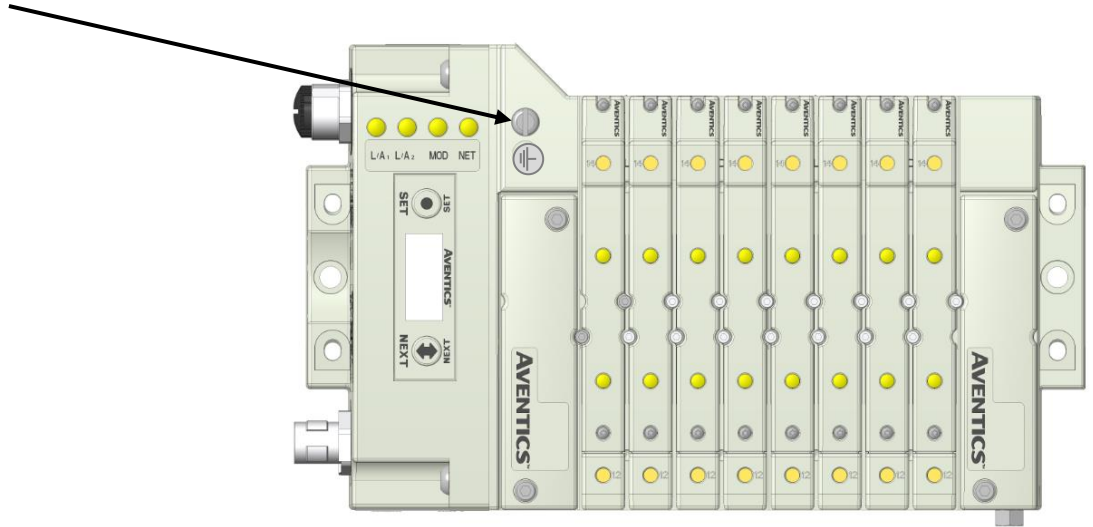


- Please see page 3-18 for external fuse sizing guide.
- When using molded connector power cables, **Do Not** rely on wire colors for Pin-Out. **Always** use pin number references.
- To be connected to a Class 2 power source only
- Class 2 Device Wiring Only – Do Not Reclassify and Install as Class 1, 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 POWERLINK™ 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

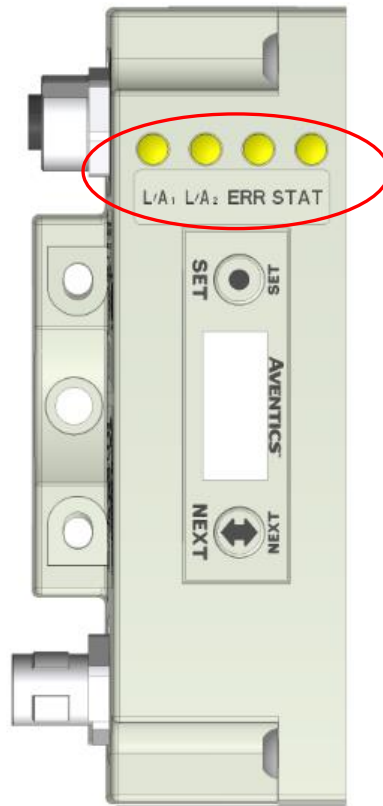
<i>Power Consumption - Power Connector Pin for VALVES</i>		
<u>Description</u>		<u>Current</u>
Number of Solenoid Valve Coils Energized Simultaneously		
___ X 0.03 A (501 Series)	=	_____ Amps
___ X 0.04 A (502 Series)	=	_____ Amps
___ X 0.07 A (503 Series)	=	_____ Amps
	Total:	_____ Amps
	Surge Compensation:	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 always be powered for the communication node to be functional.*
- *Reverse polarity protection is provided.*

### 4.8 Diagnostics – 580 POWERLINK™ Node LED Functions

Upon power up the STAT, ERR, L/A<sub>1</sub> and L/A<sub>2</sub> LEDs indicate the state of the unit and the network connections. There are four LEDs on the 580 POWERLINK™ node. The LEDs functions are described in the table below.



LED Name	Color	Status	Description
STAT	Green	ON	Powerlink™ connection established
		FLASHING -100ms	No Powerlink™ connection
		FLASHING - 500ms	Lost an established Powerlink™ connection
ERR	Off	OFF	No Error
	Red	ON	Lost an established Powerlink™ connection
L/A <sub>1</sub>	Off	OFF	Ethernet connection is not detected
	Green	ON	The module is connected to an Ethernet network
		FLASHING – 100ms	Powerlink™ Data is being sent / received by the node
L/A <sub>2</sub>	Off	OFF	Ethernet connection is not detected
	Green	ON	The module is connected to an Ethernet network
		FLASHING- 100ms	Powerlink™ 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. **Error! Bookmark not defined.** 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 21.

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	<b>32 coils</b>	4
	1	33-64	<b>64 coils</b>	8
	2	65-96	<b>96 coils</b>	12
	3	97-128	<b>128 coils</b>	16
502/503	0	1-32	<b>32 coils</b>	4
	1	33-48	<b>64 coils</b>	8
	2	49-64	<b>64 coils</b>	8
	3	65-80	<b>96 coils</b>	12

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



Node Configuration	
(Green selections denote Factory Default settings)	
IP Address:	192.168.100.120
Subnet Mask:	255.255.255.0
Gateway IP Address:	192.168.100.240
Web Server:	Enabled
<b>Max Coils on Manifold (32 = Standard):</b>	<b>32</b>
COMM Fault / Idle Mode:	Turn OFF All Outputs
Node Configuration Parameters:	Unlocked
Display Orientation:	Normal


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



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	P580AEPL101	Powerlink 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"/>																																
		<b>Firmware Revision:</b> 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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8	9	10	11	12	13	14	15																													
16	17	18	19	20	21	22	23																													
24	25	26	27	28	29	30	31																													
		<b>Valve Status:</b> ● = 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																													
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		<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
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48	49	50	51	52	53	54	55																													
56	57	58	59	60	61	62	63																													
		<b>Valve Status:</b> ● = 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

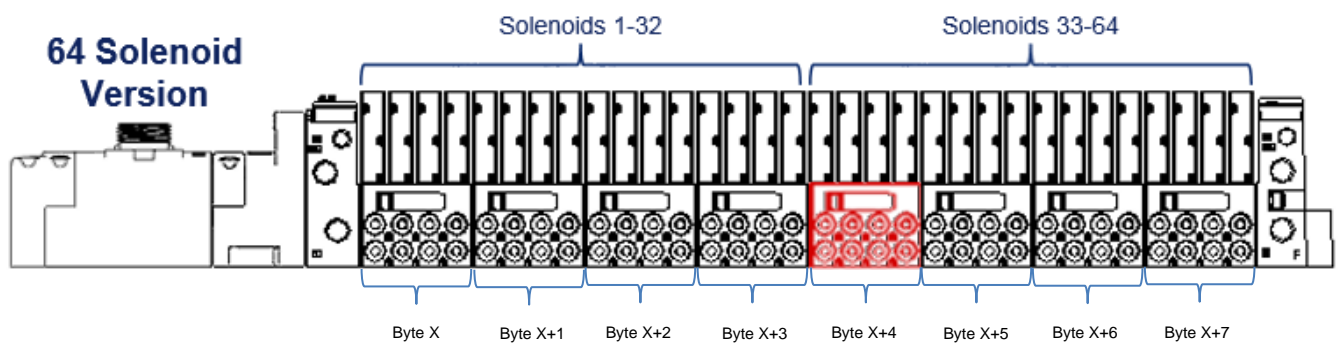
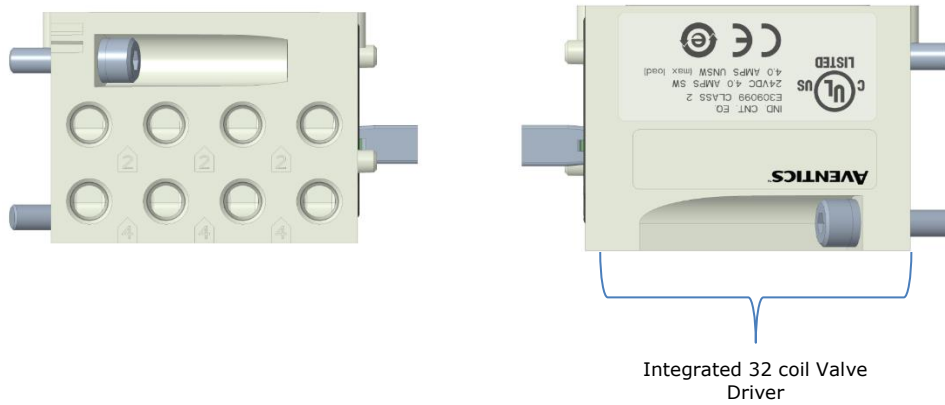
IO Mapping for each additional 502/503 series 16 coil valve driver added to the manifold assembly

<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

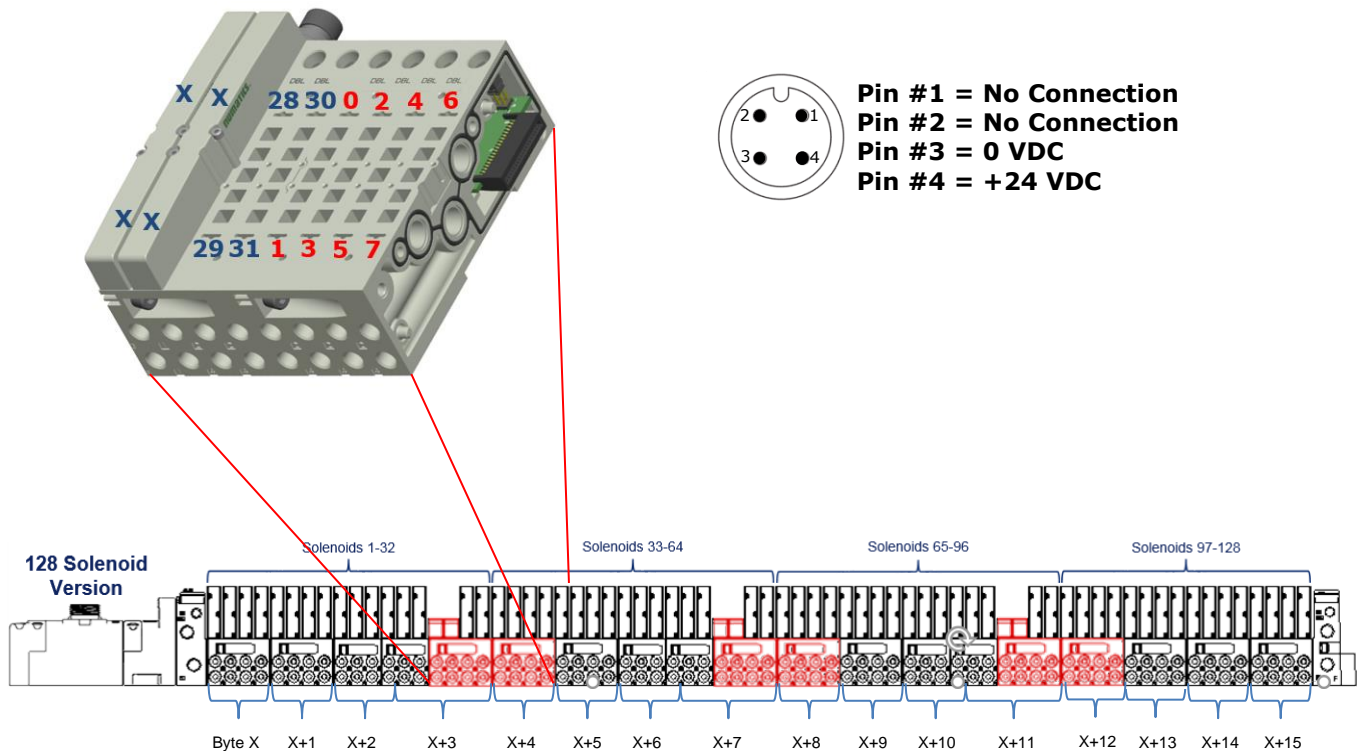
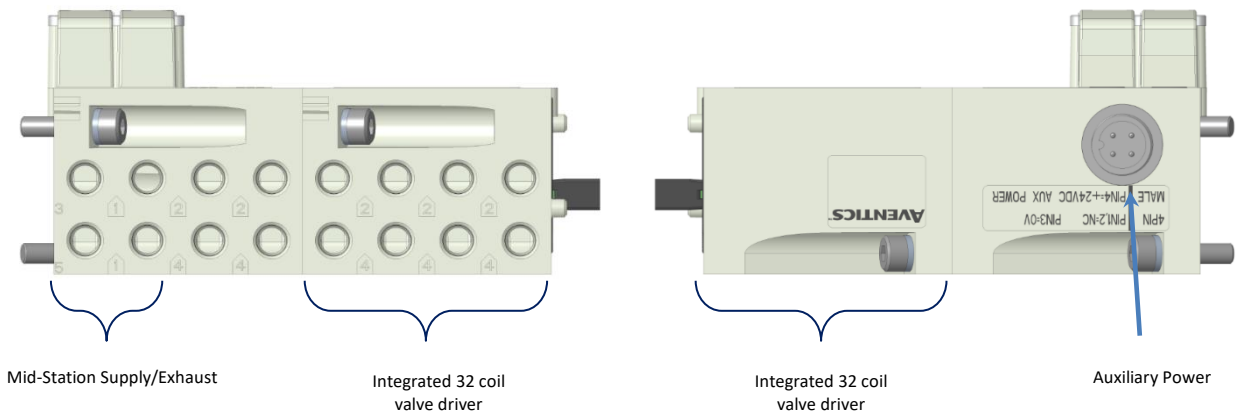




## 5.4 501 Series, up to 128 solenoid coils

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

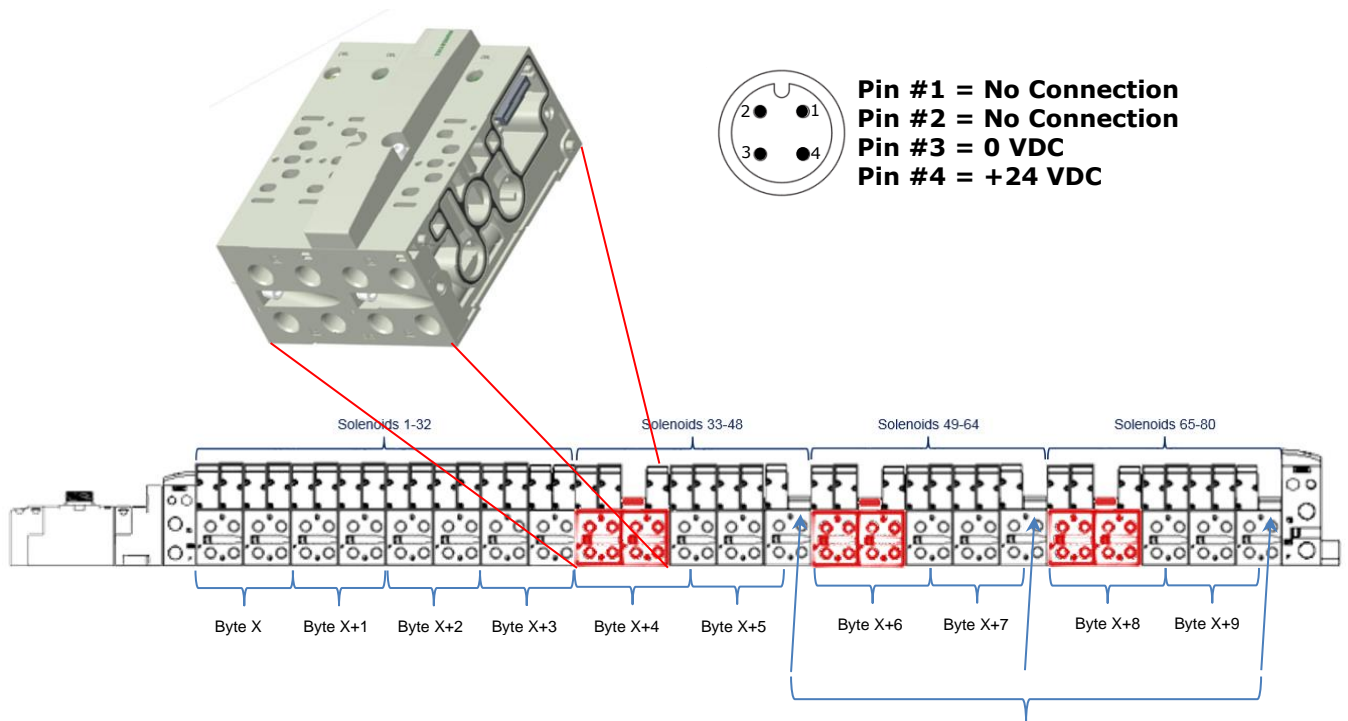
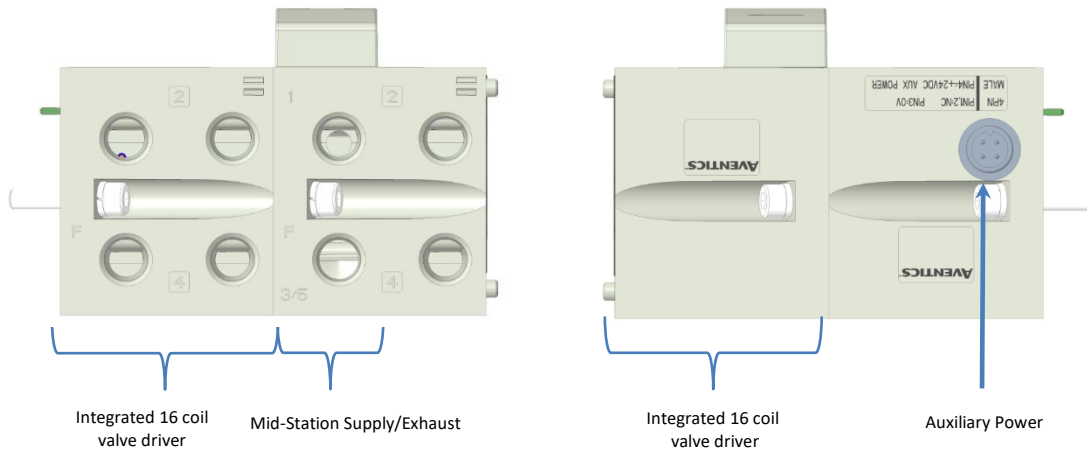
- To be used with 501 series valves on valve manifold assemblies with 33-128 coils.
- Up to 3 of these valve drivers can be used on each assembly
- Required to use on manifold assemblies larger than 64 coils, this manifold block has a M12 power connector to supplement the main power connection on the 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

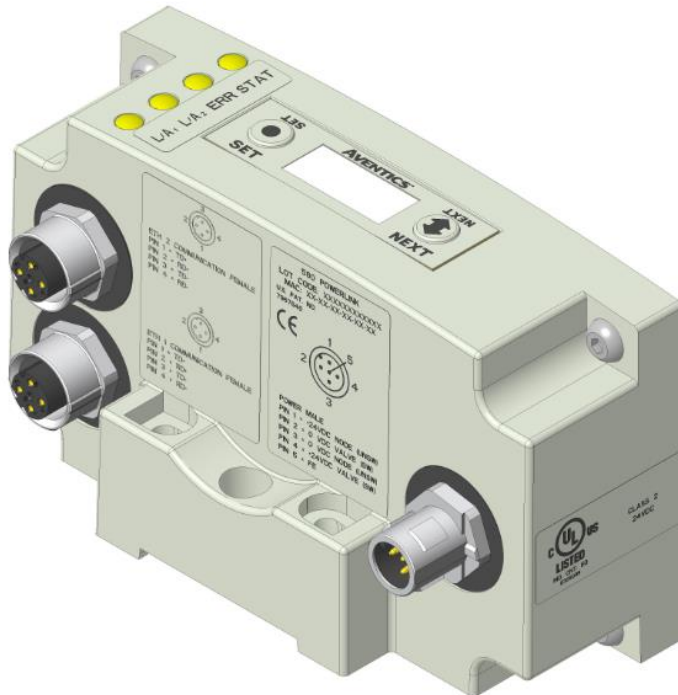
502 and 503 series, 4 station manifold with integrated 16 coil valve driver, power connector and mid-station supply and exhaust ports

- 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.



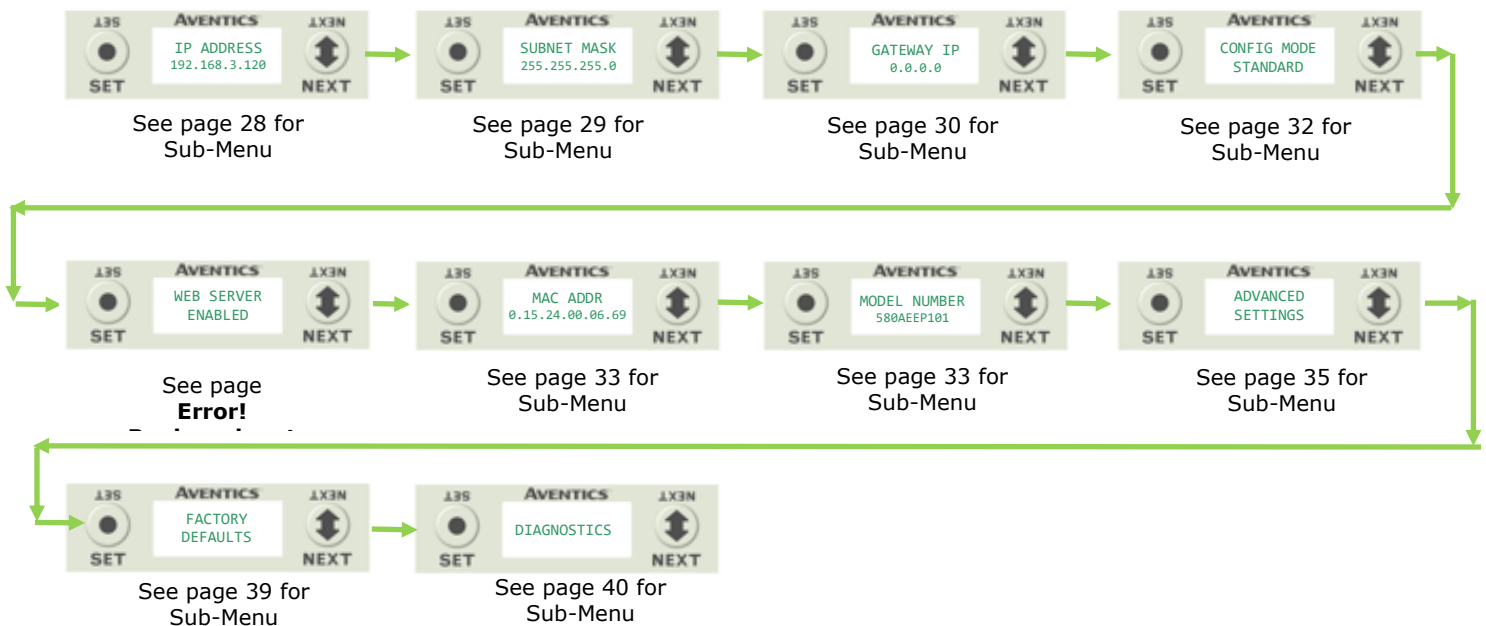
Recommended blank station plates to achieve maximum number of coils with least number of stations

## 6. 580 POWERLINK™ Node Graphic Display



The following graphic displays represent the main menu selections of the 580 POWERLINK™ 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 IP Address Sub-Menu



### Steps to Set IP Address

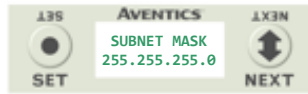
1. Press the SET button to enter the IP ADDRESS sub-menu.
2. Press the NEXT button to select the octet that you would like to change.  
Press the SET button to change the value.
3. Press the SET button to scroll through the hundred, tens and ones digits of the octet.  
Press the NEXT button to scroll 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.
  - a. Selecting **No** will bring you back to the main Address menu.
  - b. Selecting **Yes** will take you to the following SAVE SETTINGS menu
6. 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 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.



- The first three octets are fixed at 192.168.100
- Factory default address is 192.168.100.120

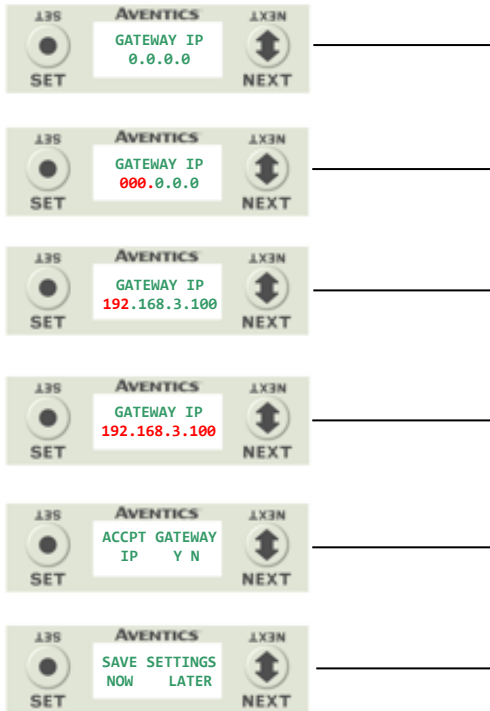
## 6.2 Subnet Mask Sub-Menu



- *The POWERLINK Factory default Subnet Mask is 255.255.255.0 and cannot be changed.*

## 6.3 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.
  - 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.

Press the SET button to confirm your choice.

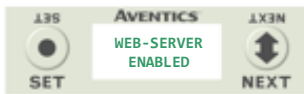


- Factory default Gateway IP is 0.0.0.0

## 6.4 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.

## 6.5 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 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



- The MAC address is for reference and cannot be modified.

## 6.8 Model Number Sub-Menu



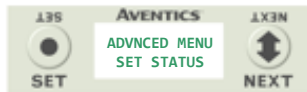
### Model Number

1. The Model Number is reference only.

## 6.9 Advanced Settings – Comm. Fault

This will allow the enabling / disabling of the Fault Action parameter. The Fault Action parameter determines the behavior of the outputs during a communication fault. Please see page **53** for more details.

### Fault Action Settings



1. Press the SET button to enter the ADVANCED SETTINGS menu.
2. Press the NEXT button to scroll to the ADVANCED MENU / SET FAULT IDLE.
3. Press the SET button to enter the ADVANCED MENU / SET FAULT IDLE.
4. Press the SET button to enter the SET FAULT IDLE / FAULT ACTION menu.
5. The current state of the parameter is shown
6. Press the SET button to change this parameter  
Press the NEXT button to scroll the choices for the desired output action during a fault state.
  - a. OFF (Factory Default)
  - b. HOLD LAST STATE
  - c. RETURN (this will return you to the SET FAULT/IDLE menu)

Press the SET button to confirm your choice.

7. Press the NEXT button to select Yes or No to accept the selection  
Press the SET button to confirm your choice
  - a. Selecting No will bring you back to the main SET FAULT/IDLE menu.
  - b. Selecting Yes will take you to the following saved settings menu.

#### Save Settings Steps

8. Press the NEXT button to select either NOW or LATER.  
Press the SET button to confirm your choice.
  - a. Selecting NOW will cause the node to reset and apply the new setting
  - b. Selecting LATER will cause the new FAULT ACTION selection to be saved in memory, you must Accept the saved changes before your next power cycle otherwise they will be lost.

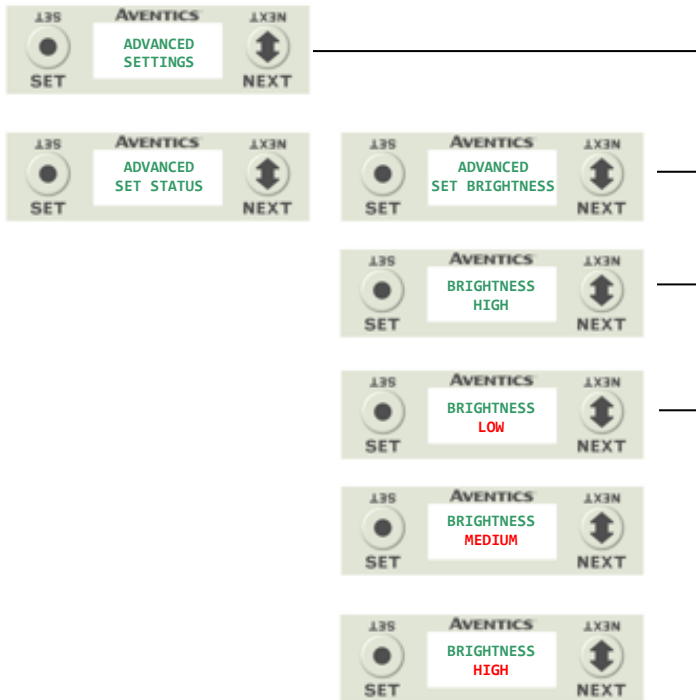
Press the SET button to confirm your choice.



- Factory Default is Fault Action OFF

## 6.10 Advanced Settings - Brightness

### Brightness Settings

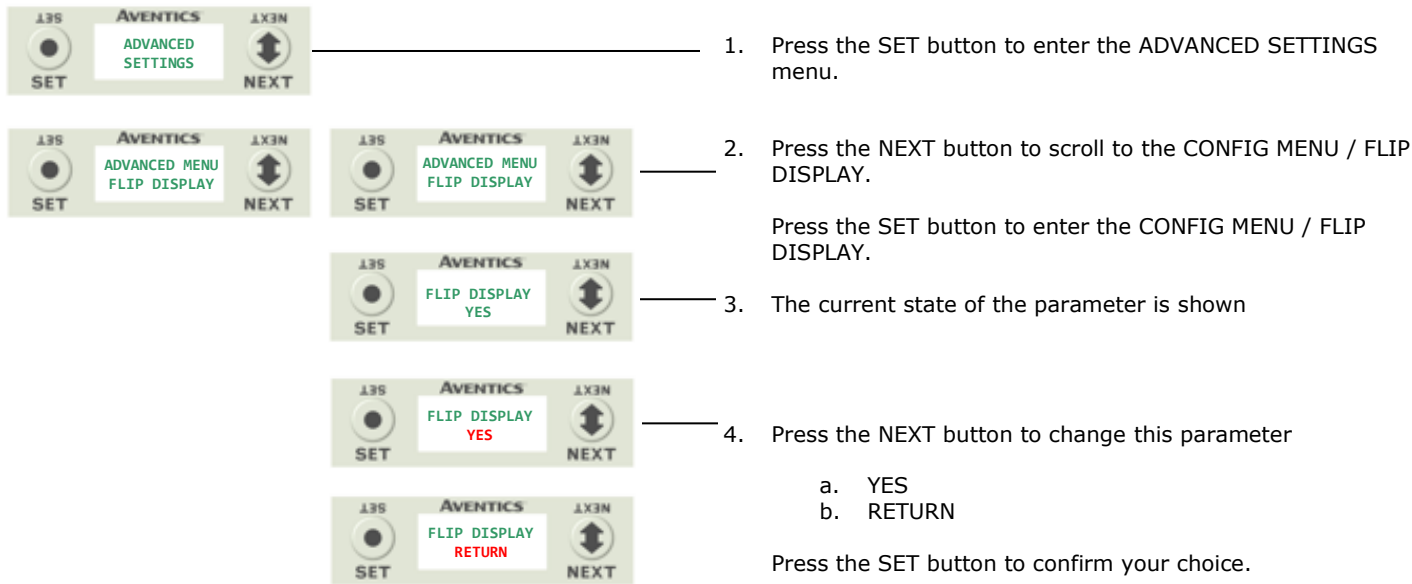


1. Press the SET button to enter the ADVANCED SETTINGS menu.
2. Press the NEXT button to scroll to the CONFIG MENU / SET BRIGHTNESS. Press the SET button to enter the CONFIG MENU / SET BRIGHTNESS.
3. The current state of the parameter is shown
4. Press the SET button to change this parameter. Press the NEXT button to scroll the choices for the desired brightness of the graphic display for all modules on the G3 system.
  - a. LOW
  - b. MEDIUM
  - c. HIGH (Factory Default)

Press the SET button to confirm your choice. The changes will take effect immediately.

## 5.12 Advanced Settings – Flip Display

### Flip Display Settings



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

## 5.13 Advanced Settings – Parameters Lock

### 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.

## 5.14 Advanced Settings – Configuration Lock

The flowchart illustrates the Configuration Lock Settings process through six sequential screens. Each screen features a 'SET' button on the left and a 'NEXT' button on the right. The screens are: 1. 'ADVANCED SETTINGS' (green text), 2. 'ADVANCED MENU CONFIG LOCK' (green text), 3. 'CONFIG LOCK UNLOCKED' (green text), 4. 'CONFIG LOCK UNLOCKED' (red text), 5. 'ACCEPT LOCKED Y/N' (green text), and 6. 'CFG MISMATCH MODULE 1' (green text).

### Configuration Lock Settings

- Press the SET button to enter the ADVANCED SETTINGS menu.
- Press the NEXT button to scroll to the CONFIG MENU / CONFIG. LOCK.  
Press the SET button to enter the CONFIG MENU / CONFIG. LOCK.
- The current state of the parameter is shown
- Press the SET button to change this parameter
- Press the NEXT button to scroll through the choices to enable or disable the feature.
  - UNLOCKED (Factory Default)
  - LOCKED
  - RETURN (this will return you to the main menu)
- Press the SET button to confirm your choice.
- Press the NEXT button to select Yes or No to accept the selection.
  - Selecting No will bring you back to the main menu.
  - Selecting Yes will take you to the following apply changes menu.

Press the SET button to confirm your choice.

### Apply Changes Steps

- 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 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.

Note;  
By choosing LOCKED, the manifold configurations will be stored in memory and the PHYSICAL manifold configuration cannot be changed. UNLOCKED, the manifold configurations can be changed without errors.

## 6.12 Factory Defaults

### Factory Default Settings



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



5. Press the SET button to change this parameter



6. 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

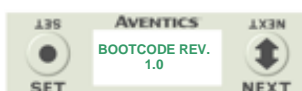
Press the SET button to confirm your choice.

## 6.13 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

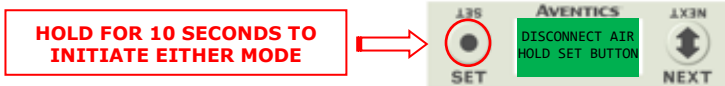
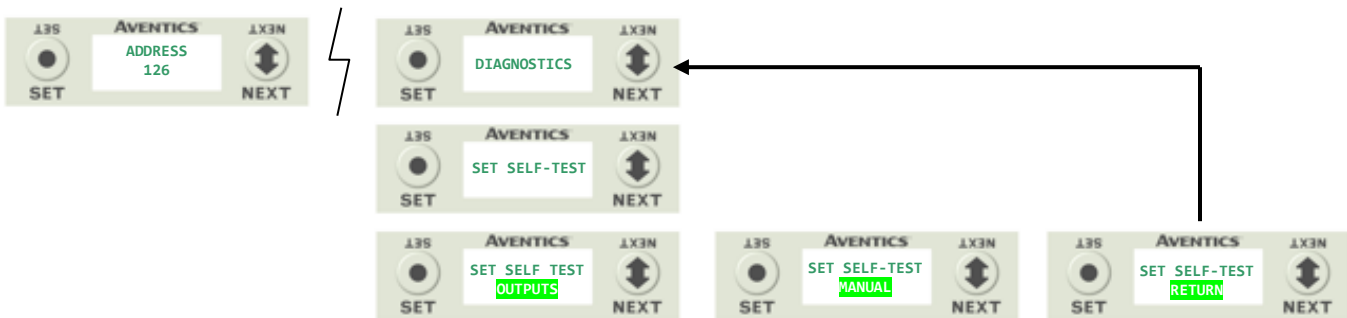
An internal diagnostic tool can be enabled on the 580 (node) using the graphic display. This tool allows the user to confirm that the manifold outputs (coils) are fully functional without a network connection or controller. There are two test modes that the user can choose. The "OUTPUTS" test mode tests 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.



### "OUTPUTS"

The connected outputs will cycle every 0.5 seconds.



Push to Energize flashing coil output



Push again to De-energize



### "MANUAL"

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.

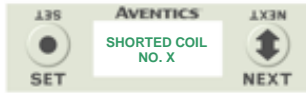
The user can advance quickly through the available coils by pressing and holding the NEXT button for at least 3 seconds.



A Power Cycle is required to Deactivate SELF TEST MODE

## 6.15 Messages Error Messages

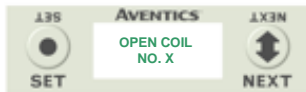
The following are automatic error messages that are displayed when specific faults occur during operation:



Displayed when a short circuit condition is detected on a valve coil.



Displayed when +24 VDC on Pin No. 2 Valves (SW) and Pin No. 4 Valves (SW) is not present.



Displayed when an open circuit condition is detected on a valve coil.

## 7. POWERLINK™ Integrated Web Server

### 7.1 Connecting to an Aventics 580 Powerlink™ Node

This section will discuss how to connect a computer to a 580 Powerlink™ 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 13 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 Powerlink™ 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 28 .
6. Open a web browser on the computer and type in the IP address of the manifold  
Ex. <http://192.168.3.120>
7. The following popup appears that describes the risks of using the webserver on a Powerlink™ network

**\* SAFETY WARNING \***

**Access to the Numatics 580 Web page over the POWERLINK network can cause erratic network behavior and PLC shutdown.**

To exit this page close this browser window/tab or navigate to a different site.

To continue to the Numatics 580 Web page click the button below.

I understand the risks. Proceed to the Numatics 580 Web Page.



**CAUTION**

Connecting to a 580 POWERLINK™ web server within a PLC controlled network will disrupt POWERLINK™ communication resulting in PLC shutdown!



ETHERNET   
**POWERLINK**

8. You have successfully connected a computer to an Aventics 580 Powerlink™ manifold.

## 7.2 Using the Functionality of the 580 Powerlink™ Web Server

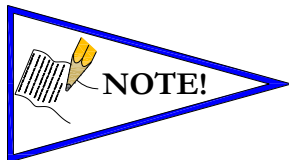
This section will discuss the functionality of the built in Ethernet server. Every Aventics Powerlink™ manifold has this feature. Through this server you can configure the node, force outputs (valves), check diagnostics, etc. Each Aventics' web page will be explained.

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 Powerlink™ manifold. From this page, the user can navigate the entire built-in web server.



ETHERNET   
**POWERLINK**



- The 1<sup>st</sup> 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)	
IP Address:	192.168.100.120
Subnet Mask:	255.255.255.0
Gateway IP Address:	192.168.100.240
Web Server:	Enabled
Max Coils on Manifold (32 = Standard):	32
COMM Fault / Idle Mode:	Turn OFF All Outputs
Node Configuration Parameters:	Unlocked
Display Orientation:	Normal

Update Configuration

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.

**The Node will reset in a few seconds, or you may cycle power to enable the new configuration.**

Note: If you have altered the IP Address or subnet settings, be sure to adjust your browser/computer settings accordingly.

Close this popup to reload the page.

Close

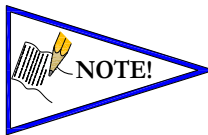
## Node Password

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"/>

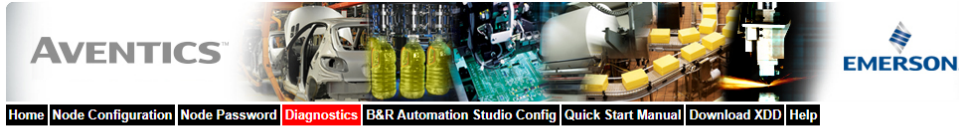
This page allows password protection of the [Node Configuration](#) page and the I/O Force & Test features of the [Diagnostics](#) page. To disable password protection, leave the "Enter New password" box empty. If you have forgotten a previously set password please contact Aventics Technical support.



- *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

Relevant node information including firmware revision

Module	Part No.	Description	Details	Activity
Node	P580AEP101	Powerlink 580 Module	<input checked="" type="checkbox"/> Show Details	<input checked="" type="checkbox"/> Close all Details
	Firmware Revision: 1.1 Build 44027 IP Address: 192.168.100.120 Subnet Mask: 255.255.255.0 Gateway IP Address: 192.168.100.240 MAC Address: 00-15-24-01-45-bd Diagnostic Word Status: OK Diagnostic Word Byte 0: 0 1 2 3 4 5 6 7 Diagnostic Word Byte 1: 0 1 2 3 4 5 6 7 Bit 0: Switched Power Status Bits 1-7: Not Used Bits 0-7: Not Used		<input type="button" value="Factory Defaults"/> <input type="button" value="Firmware Upload"/>	
Valves		580 Integrated 1-32 Coils Module	<input checked="" type="checkbox"/> Show Details	<input checked="" type="checkbox"/> Close all Details
	Firmware Revision: 1.1 Valve Coils 0-31: Check/Uncheck box to force/un-force valve coil Valve Status: ● = Shorted Coil ● = Open Coil X = No Coil Detected		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				

Reports module status:

- ✓ = OK
- ! = Attention
- X = Lost comm.

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



## B&R Automation Studio Configuration Tab

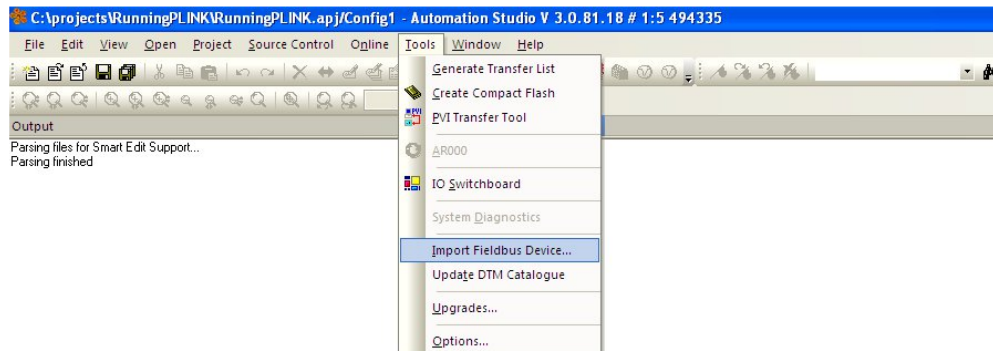
The "B&R Automation Studio Config" tab provides a guide describing how to add the 580 Powerlink™ manifold to a B&R PLC configuration. See "580 Powerlink Configuration" page 54 for more information.



### Import the XDD File

The XDD file contains the configuration information to configure Aventics valve manifolds. The XDD file is available on the Aventics, Inc. website at [fieldbus.asco.com](http://fieldbus.asco.com) or available for download through the node's built in web server. The XDD file must be uploaded to the B&R Automation Studio project before the 580 Manifold can be added to the project.

- Select "Tools"
- Select "Import Fieldbus Device"



Download XDD

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



Download embedded XDD file

Download web based XDD file

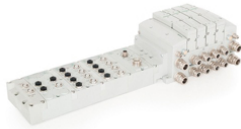
## Help

The Help button on the webpage connects to Emerson.com. The computer must have internet access for this tab to be functional.



## Numatics G3 Fieldbus Electronics

Fieldbus Communication Node, Analog/Digital I/O - DeviceNet, EtherNet, DeviceLogix, Profinet, Profibus - DP, Ethernet, CANopen



### FEATURES

- Innovative Graphic Display is used for easy commissioning, visual status & diagnostics
- Graphic Display for Configuration & Diagnostics
- Highly Distributable
- Auto Recovery Module
- Easy, Robust Connections
- Power connector allows output power to be removed while inputs and communication are left active
- IP65 / NEMA 4 Protection
- Auto Recovery Module (ARM) protects configuration information during a critical failure
- Interfaces to 2002, 2005, 2012, 2035, ISO 15407-2 & ISO 5599/III Valve Series
- Learn more about [DeviceNet](#), [DeviceLogix](#), [Ethernet](#), [Profibus-DP](#), [Profinet](#) & [CANopen](#)

[More Information](#)

### RESOURCES

- [Series G3/580 Fieldbus Electronics Catalog](#)
- [Series G3 Fieldbus Electronics Flyer](#)

### TECHNICAL DOCUMENTATION

- [G3/580 Technical and Configuration Files](#)
- [G3 Configuration Tutorial Videos](#)

### ACCESSORIES

### APPLICATIONS

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- [Press Room & Metal Stamping](#)
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## 7.3 User Configurable Device Parameters

The Aventics 580 POWERLINK™ 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>
IP Address	Set last octet of IP address (Node address)	✓	✓
Gateway IP	Set last octet of Gateway IP address	✓	✓
Subnet Mask	Sets Subnet Mask	✓	✓
Web Server	Enables/Disables Web Server Access	✓	✓
Params Lock	Selects Parameters Locked/Unlocked	✓	✓
Config Lock	Selects I/O Configuration Locked/Unlocked	✓	✓
Diagnostic Word	Enables / Disables the diagnostic word	✓	✗
I/O Diagnostic Status	Allocates I/O diagnostic status bits	✓	✗
Output Fault Action	Determines whether to use idle value attribute or hold last state	✓	✗

## 7.4 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 580 coils will have during an “Idle” event or a “Fault” event.

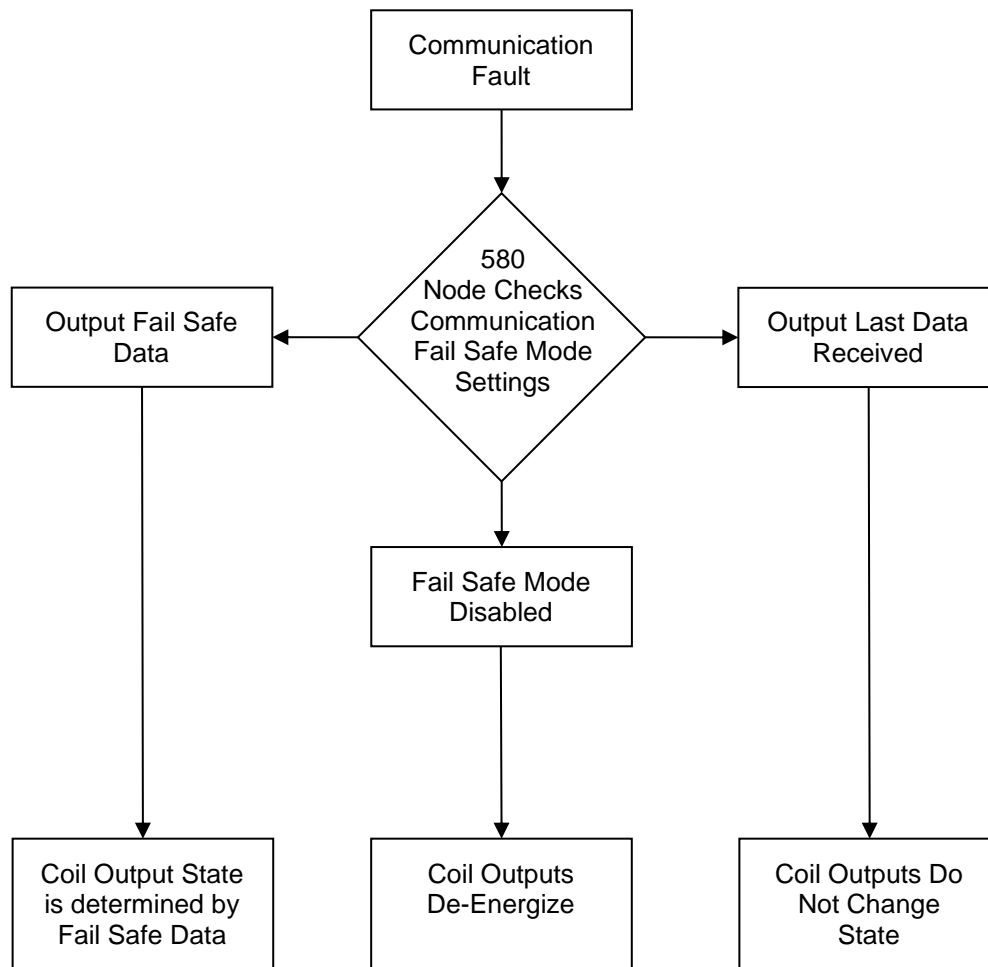
The user determines how the outputs behave when a communication fault or idle actions occurs. These settings are non-volatile and thus will not change upon loss of power.

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).

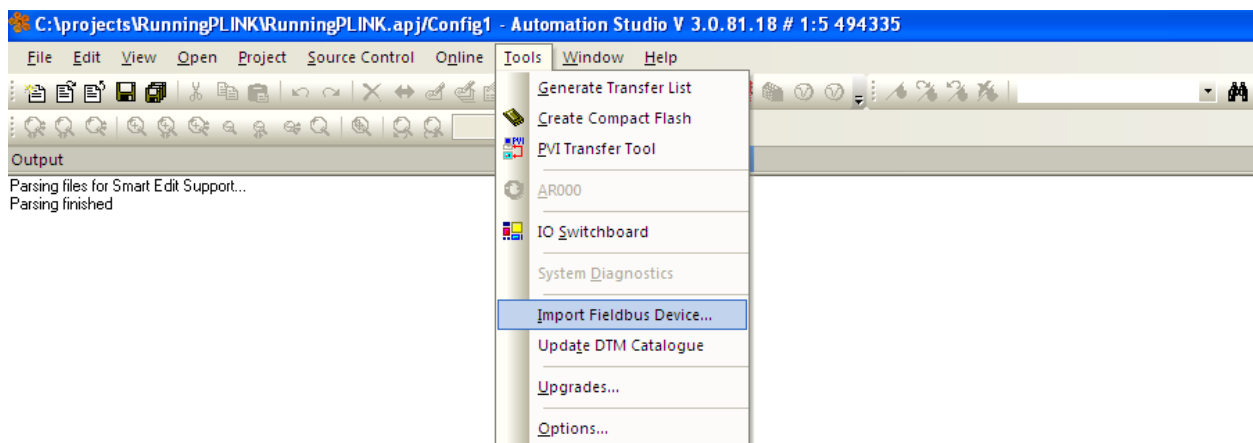


## 8. B&R Automation Studio and 580 Configuration

### 8.1 Import the XDD File

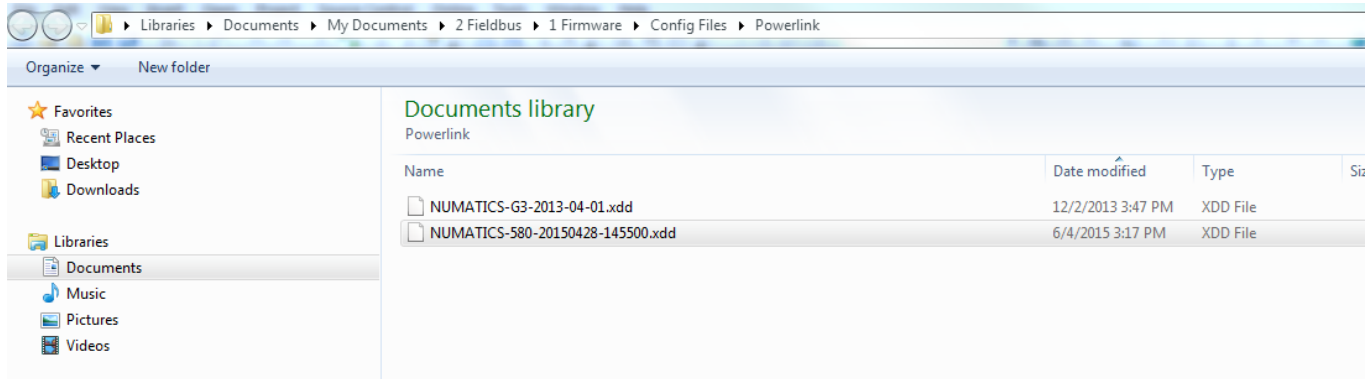
The XDD file contains the configuration information to configure Aventics valve manifolds. The XDD file is available on the Aventics website at [www.asco.com/fieldbus](http://www.asco.com/fieldbus) or available for download through the node's built in web server. The XDD file must be uploaded to the B&R Automation Studio project before the 580 Manifold can be added to the project.

Select "Tools"  
Select "Import Fieldbus Device"



## Import the XDD File (continued)

Select the folder containing the Aventics-580.XDD  
Select Open  
The XDD file is imported

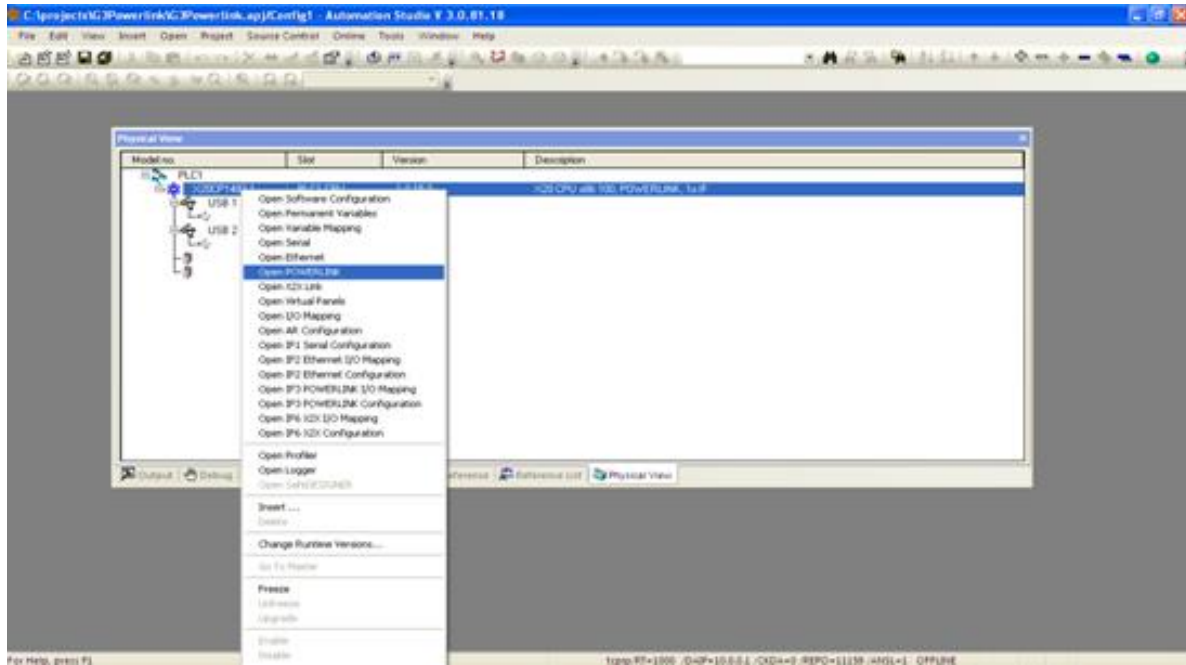


Insert the Aventics 580 into the PLC Configuration

Open "Physical View"

Click on the configured PLC

Right click and select "Open POWERLINK"

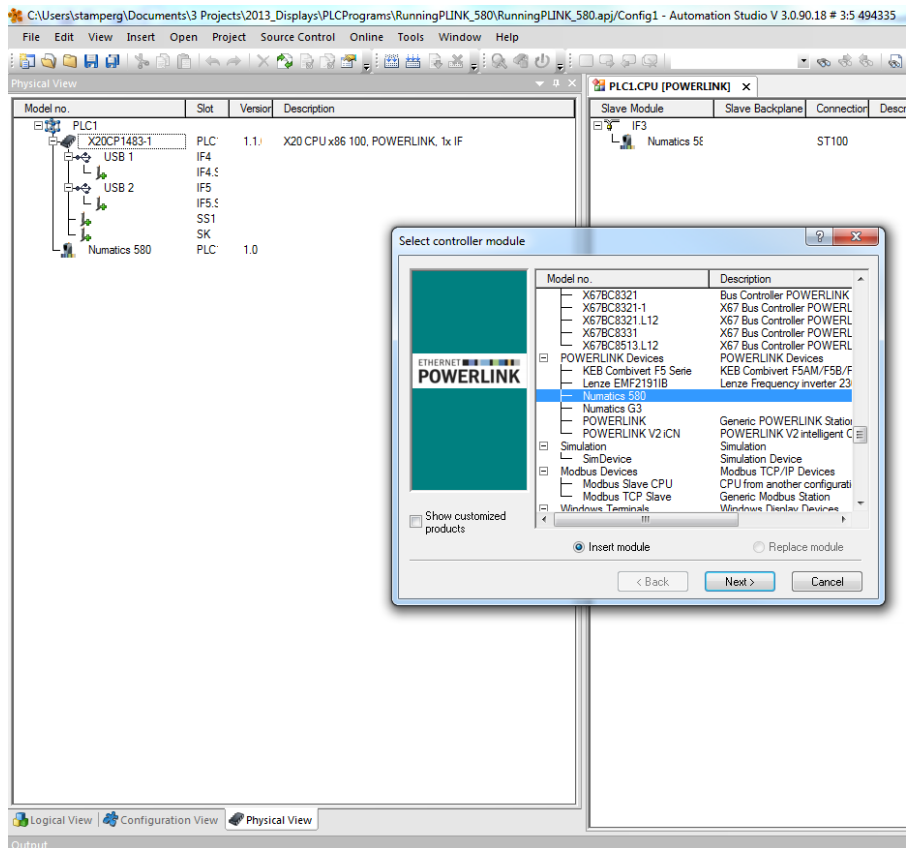




Insert the Aventics 580 into the PLC Configuration

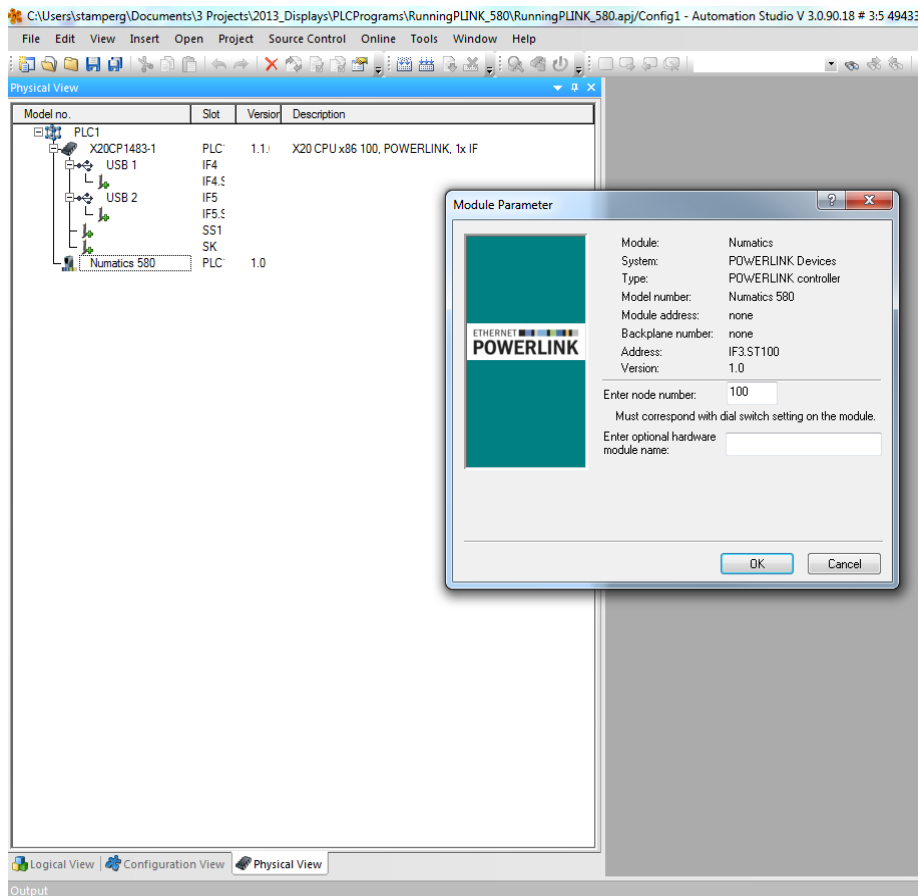
Select IF3 (POWERLINK™ Master)  
Right click and select "Insert"  
Scroll down and select Aventics 580

Select "Next"



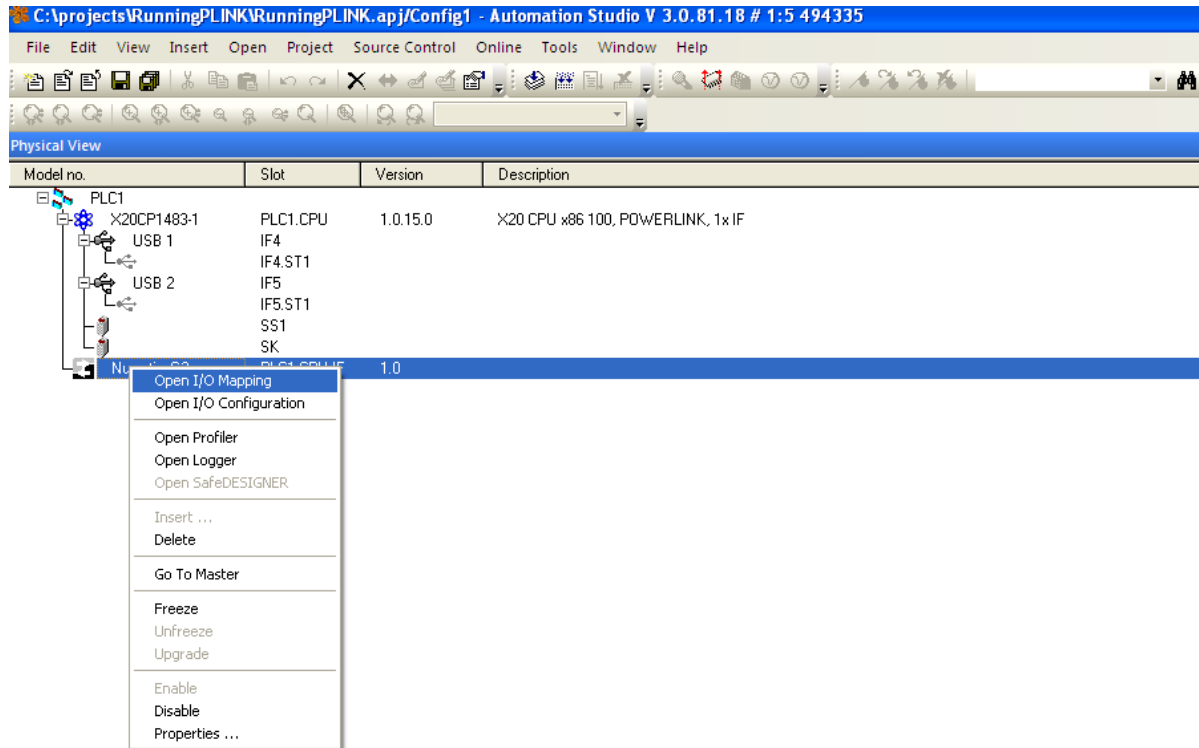
## Assign the Aventics POWERLINK™ Node Number

The "Module Parameter" window appears  
 Enter the desired "Node Number" (IP address 4<sup>th</sup> Octet)  
 Enter a "Hardware Module Name" (optional)



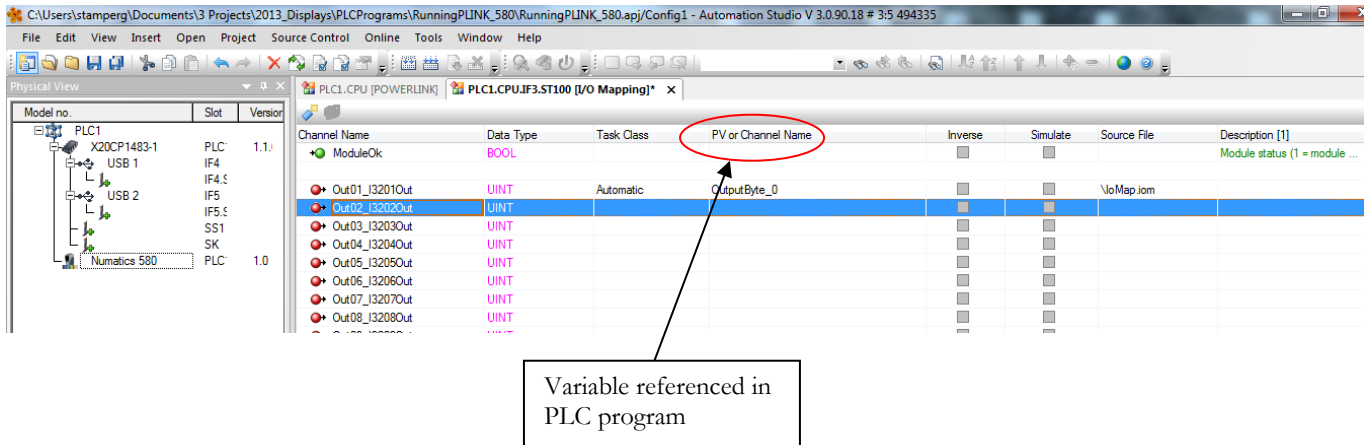
## Configure the Aventics POWERLINK™ Node I/O Map

From the Physical View right click Aventics 580  
Select I/O Mapping



## Configure the Aventics POWERLINK™ Node I/O Map (continued)

The 580 POWERLINK™ valve outputs are written from a block of unsigned integer data bytes. Configure the I/O map by assigning variable names to the individual data bytes as shown below. The variable names (PV or Channel Name) are referenced within the Automation Studio project.



## 9. POWERLINK™ 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 not configurable.

### 9.2 Bit Mapping Rules

The bit mapping for a 580 POWERLINK™ 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 1<sup>st</sup> manifold station nearest the node using "14" coil 1<sup>st</sup> 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

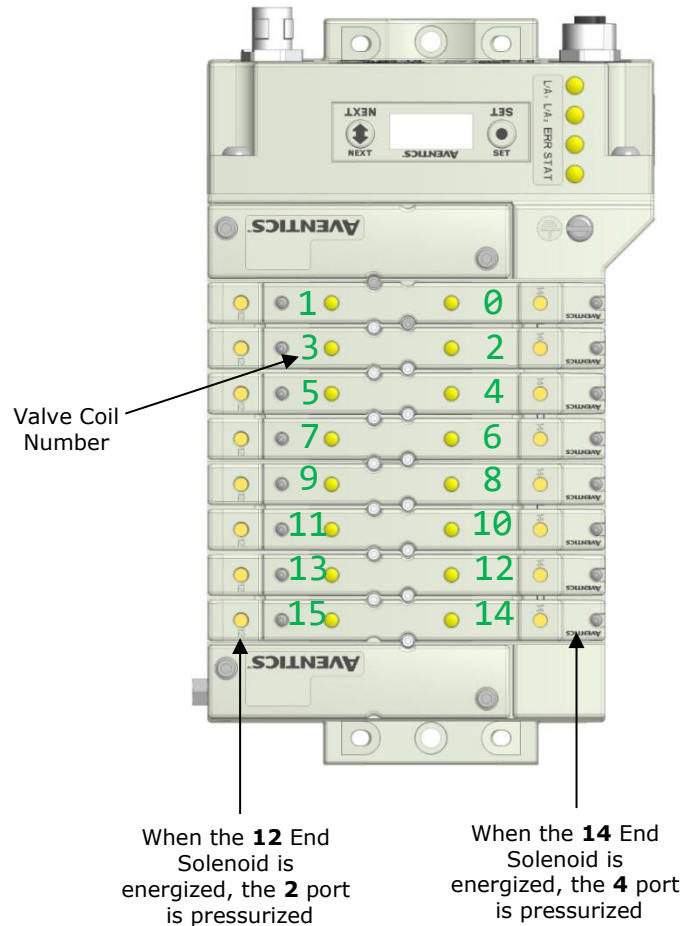
- All double solenoid valves
- Double Z-Boards™, stations 1-8
- 32 coils (4 Bytes) allocated (non-settable)

### 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	P580AEPL1010A00
	ASSEMBLED



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	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved
3	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved
Status Input Table								
BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Comm. Module Diagnostic Bit
1	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
2	Coil No. 7 Status	Coil No. 6 Status	Coil No. 5 Status	Coil No. 4 Status	Coil No. 3 Status	Coil No. 2 Status	Coil No. 1 Status	Coil No. 0 Status
3	Coil No. 15 Status	Coil No. 14 Status	Coil No. 13 Status	Coil No. 12 Status	Coil No. 11 Status	Coil No. 10 Status	Coil No. 9 Status	Coil No. 8 Status
4	Coil No. 23 Status	Coil No. 22 Status	Coil No. 21 Status	Coil No. 20 Status	Coil No. 19 Status	Coil No. 18 Status	Coil No. 17 Status	Coil No. 16 Status
5	Coil No. 31 Status	Coil No. 30 Status	Coil No. 29 Status	Coil No. 28 Status	Coil No. 27 Status	Coil No. 26 Status	Coil No. 25 Status	Coil No. 24 Status

## 9.4 Mapping Example No. 2

### Assumed Settings

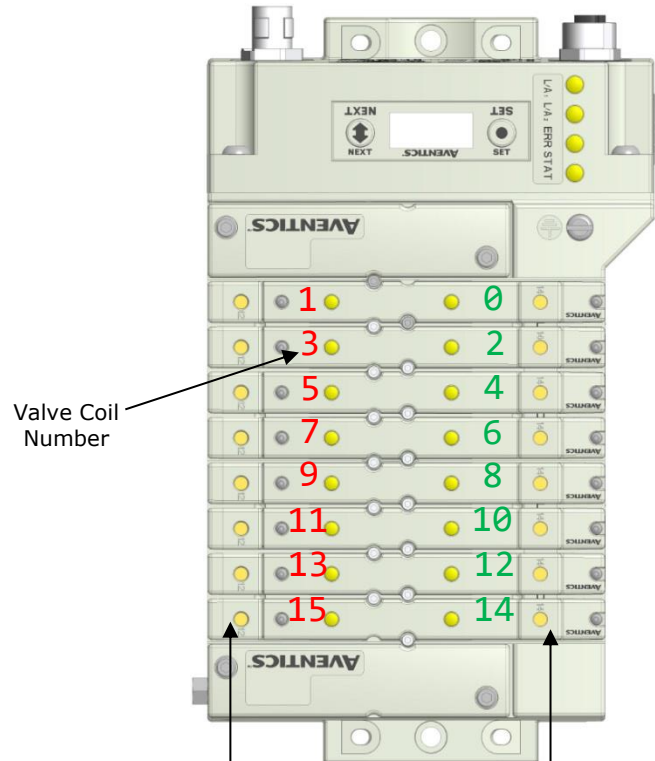
- All single solenoid valves
- Double Z-Boards™, stations 1-8
- 32 coils (4 Bytes) allocated (non-settable)

### 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	P580AEPL1010A00 ASSEMBLED



Valve Coil Number

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

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



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	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved
3	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	Allocated and Reserved	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 580 electronics.
Recommended External Fuse	External fuses should be chosen depending upon manifold configuration. Please refer to power consumption chart on page 18 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>
IP Address	192.168.100.120
Sub Net Mask	255.255.255.0
Gateway Address	192.168.100.240
Web Server	Enabled
Flip Display	Normal
Config Mode	32 Coils
Parameters	Unlocked
Diag. Word	Enabled
I/O Status	Enabled
Fault Action	Off



## 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 61 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 electrical /electronic interface. Available in single or double solenoid versions.

## 10.5 Technical Support

For technical support, contact your local Aventics distributor. If further information is required, please call Aventics Technical Support Department at (248) 596-3333.

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>