NUMATICS®

580 EtherNet/IP™
Technical Manual

EtherNet/IP™

EtherNet√IP™
conformance tested

Conditions for use of this product

(1) ASCO Numatics Manifold ("the PRODUCT") shall be used in conditions;

    i) Where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident.

    ii) Where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

ASCO Numatics 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 ASCO Numatics Technical, User, Instruction, Safety manuals or bulletins.

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

 Caution symbol indicates a possible hazard which may cause injury or equipment damage.

NOTE!

Note symbol indicates important information regarding equipment installation and setup.

Electrical installation and operational guidelines

CAUTION

- *To be connected to Class 2 power source only.*
- *All ASCO Numatics communication nodes should be grounded during the installation process. These grounding guidelines can be found in National Electrical code IEC 60204-1 or EN 60204-1.*
- *All ASCO Numatics 580 Electronics Products to be installed or wired in accordance with ASCO Numatics' published instructions and applicable electrical codes.*
- *MULTIPLE CLASS 2 POWER SOURCES: When interconnects, class 2 sources shall be Listed and rated suitable for parallel interconnection.*
- *Sources shall be Listed and rated suitable for parallel interconnection.*
- *CLASS 2 WIRING: All field wiring shall be suitable for Class 1, Electric Light and Power, or Class 2, 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.*
- *Class 2 Device Wiring Only – Do 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) employed.*
- *MULTIPLE CLASS 2 POWER SOURCES: When interconnects, class 2 sources shall be Listed and rated suitable for parallel interconnection.*
- *Sources shall be listed and rated suitable for parallel interconnection.*

Table of Contents

1. About EtherNet/IP^{TM}

1.1 Overview

EtherNet/IP^{TM} is a communication protocol that uses the same network technology that can be found in commercial and domestic operations worldwide, but has added benefits/features toward manufacturing applications. It is a CIP (common industrial protocol) Network that follows the Open Systems Interconnection (OSI) model.

The ODVA (Open DeviceNet Vendor Association) is an independent organization that governs the EtherNet/IP^{TM} specification and oversees conformance testing for products.

EtherNet/IP^{TM} 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 20º C.

More information about EtherNet/IP^{TM} and ODVA can be obtained from the ODVA web site www.odva.org.

1.2 580 EtherNet/IP^{TM} Features

Features	Description
EtherNet/IP^{TM} Spec. Supported	Designed to EtherNet/IP^{TM} Specification
Bus Topology	Star and Multi-Star
Baud Rates Supported	10/100 Mbps and Autobaud
CE	CE Compliant
Address Setting	Via DHCP/BOOTP, Web Page Configuration, Graphical Display
Duplex	Half and Full supported
Conformance Tested	Tested by ODVA for conformance

## 1.3 580 EtherNet/IP^{TM} Performance Data

Features	Description
CIP Connections Consumed	1
CIP Connections Available	16
Packets Per Second (PPS)	10,000
RPI	≥5ms
Connection Type	Multicast, Unicast

2. 580 Introduction

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

This manual details specific information for configuring and commissioning the ASCO Numatics 580 EtherNet/IP™ Node. For more information relating to pneumatic valves and valve manifold assemblies, please refer to the ASCO Numatics *501 & 503 Series Catalogs* at www.asco.com.
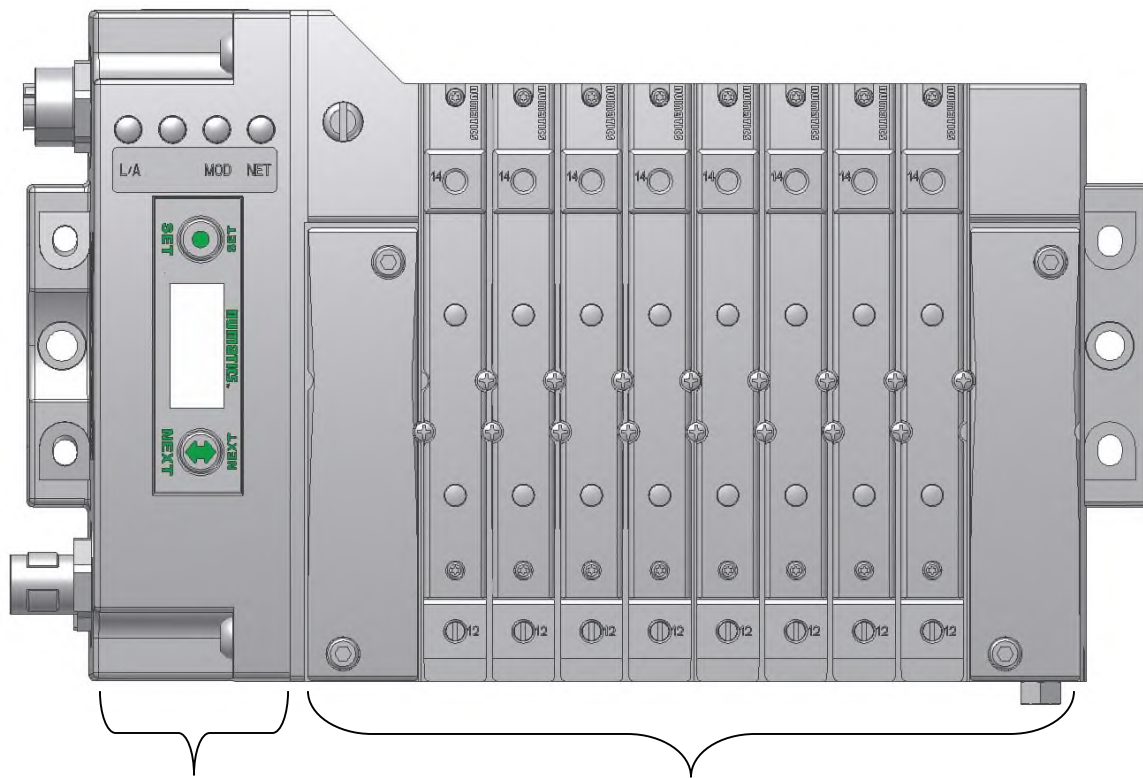
580 EtherNet/IP ™ Node   **Valve Side**
Drives up to 32 coils

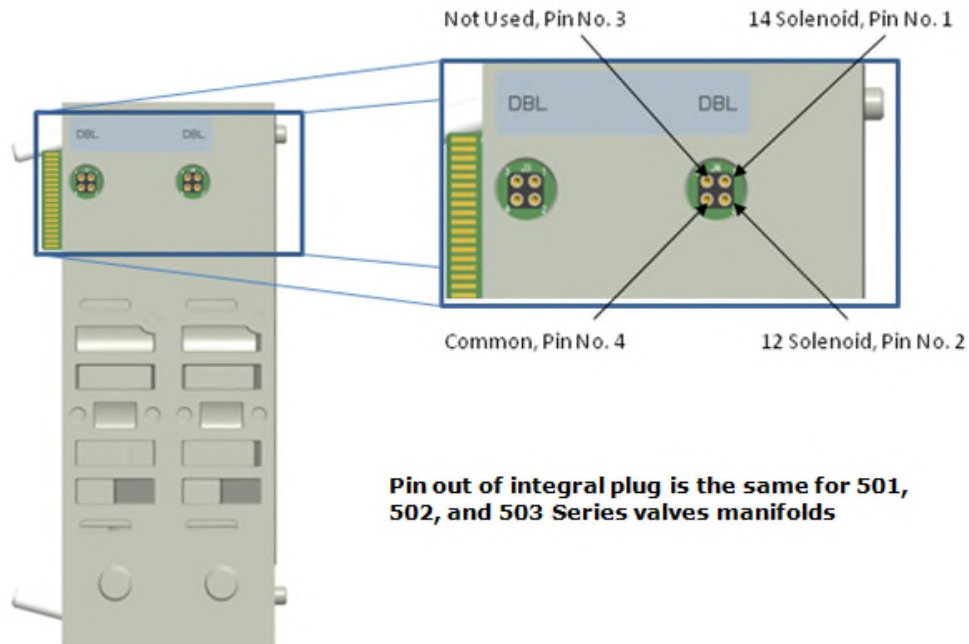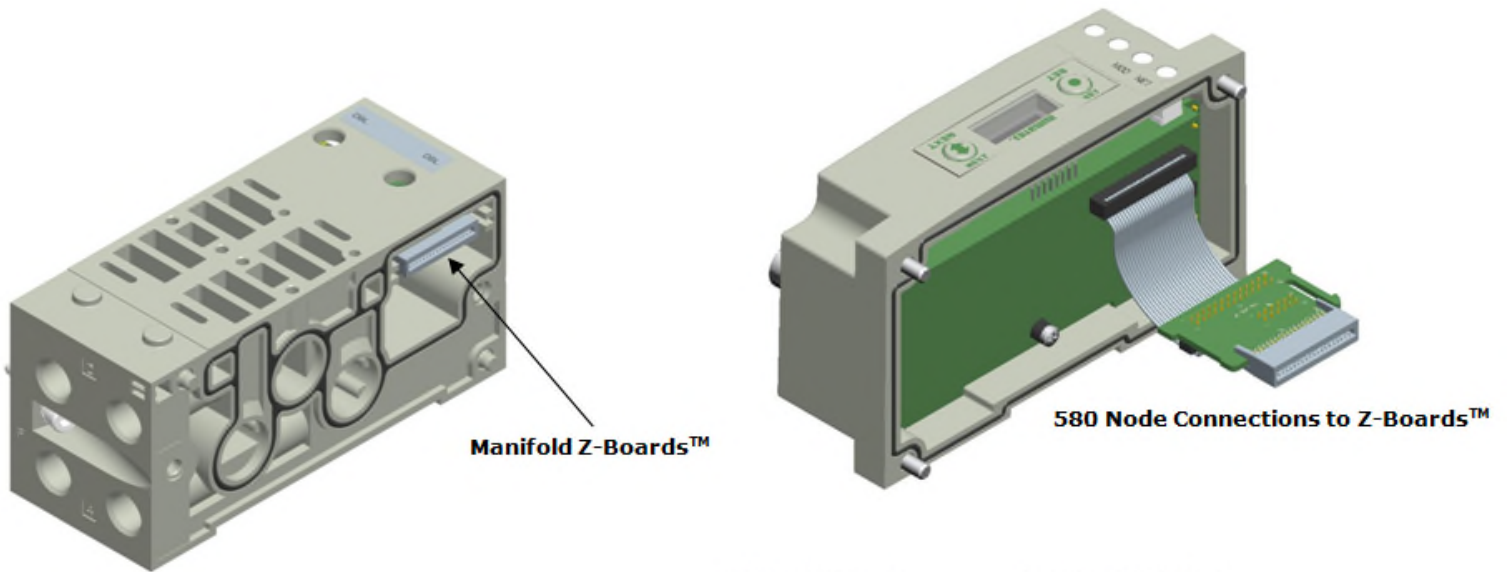## 2.1   Pneumatic Valve Manifold – 501 Series shown

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 connections from solenoid coils to output drivers without the use of wires). This allows easy assembly and field changes.
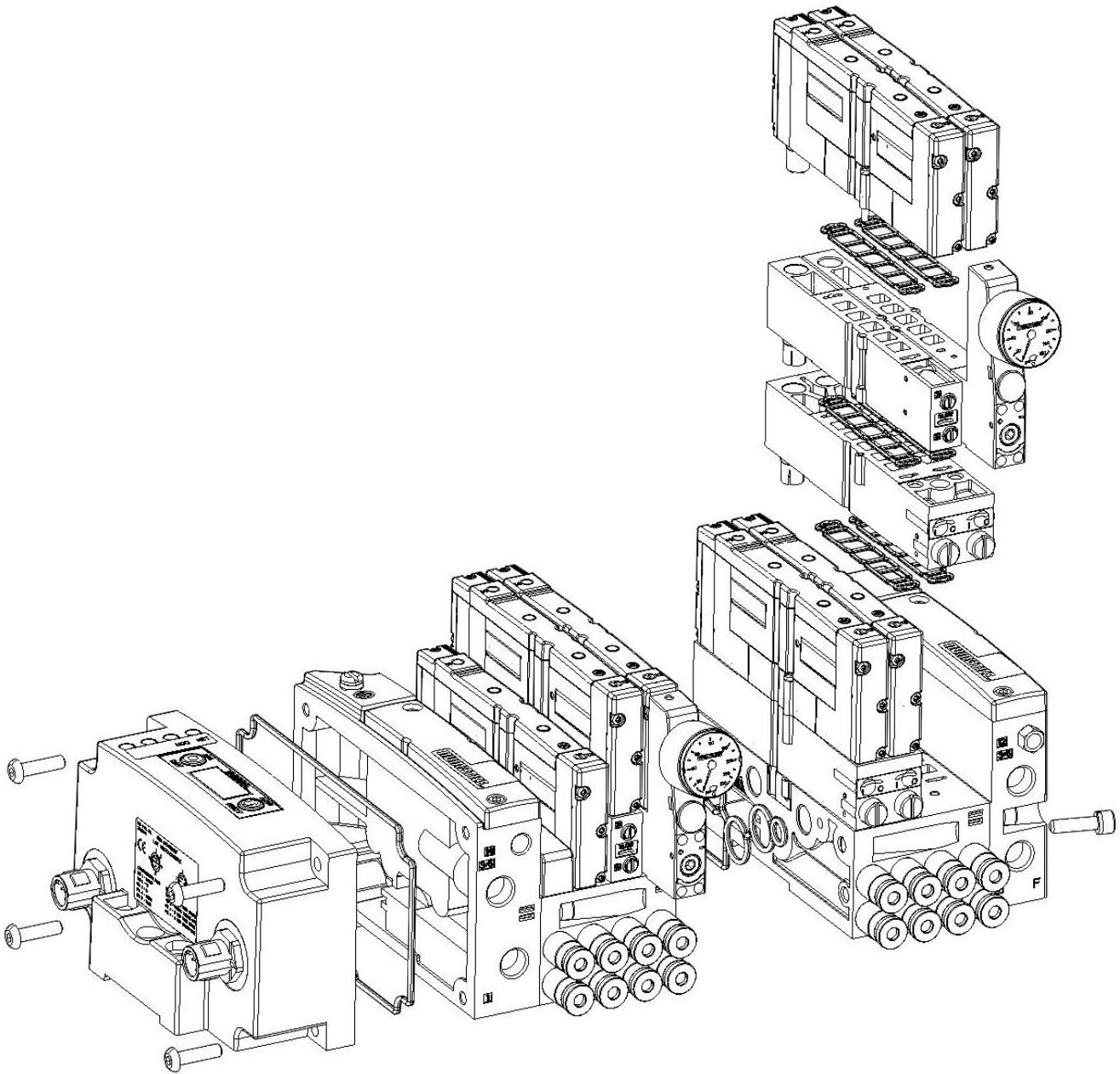
2.2   Manifold Connectors

Solenoid Coil Connections using Z-Board™ Technology for 501/502/503 valve series

Z-Board™ plug-together technology connects all valve solenoids to the valve coil output drivers, located in the 580 Node. There is a maximum of 32 coil outputs available on the complete manifold assemblies. The 32 available outputs are accessed on the 501 series valves utilizing 4 station manifolds and on the 502 and 503 series utilizing 2 station manifolds.

Manifold Z-Boards™

580 Node Connections to Z-Boards™

Not Used, Pin No. 3

14 Solenoid, Pin No. 1

Common, Pin No. 4

12 Solenoid, Pin No. 2

Pin out of integral plug is the same for 501, 502, and 503 Series valves manifolds

NOTE! *A single solenoid valve's coil is always on the "14" end.*

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) station, the 502 and 503 Z-Board™ is minimum (2) stations.

501 Series	502 Series

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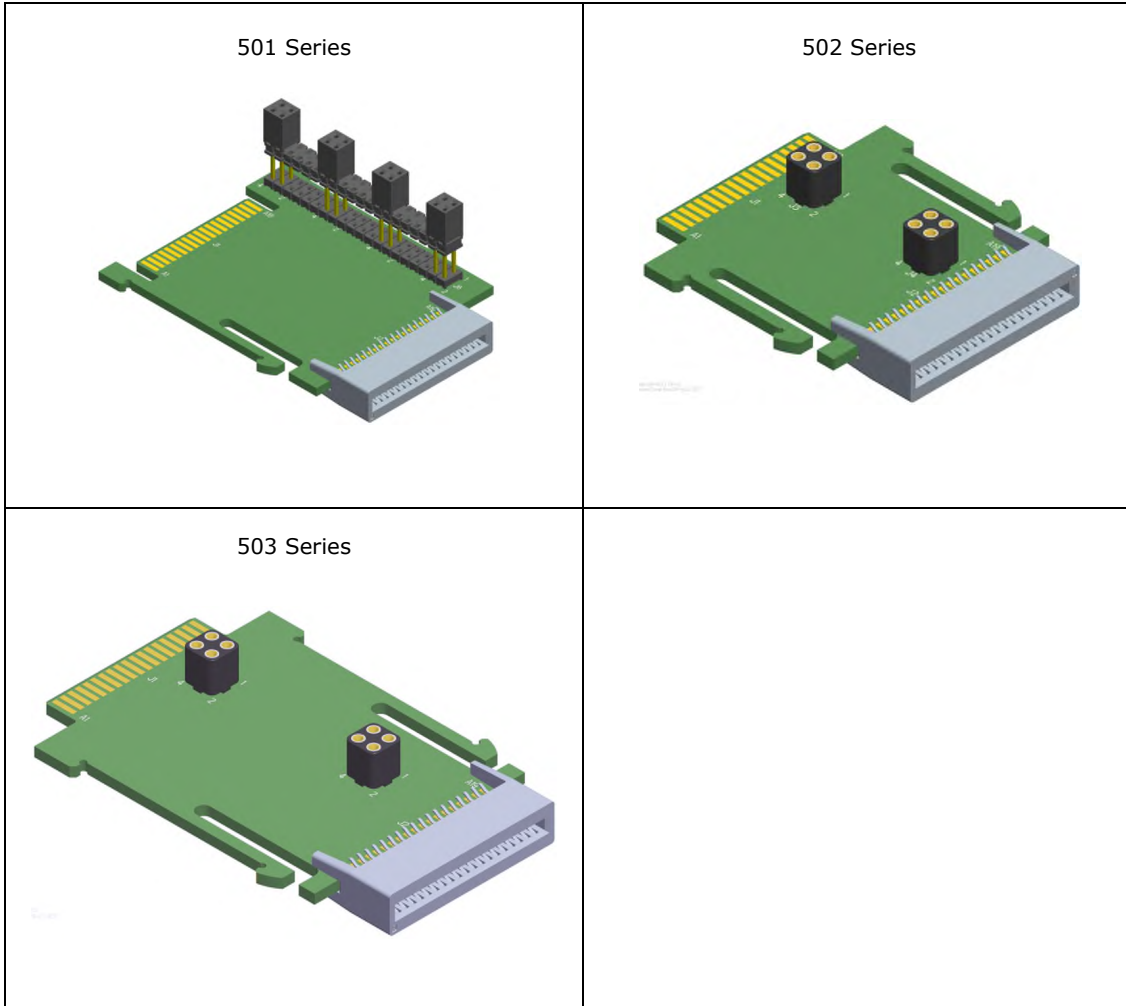
> **NOTE!** Each series Z-Board™ can be selected in either SINGLE or DOUBLE output (coil) versions. The SINGLE and DOUBLE output function cannot be mixed on the Z-Boards™

3.   Communication Node

3.1   EtherNet/IP™ Node

This module is the Communication Node 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 ASCO Numatics 580 EtherNet/IP™ Node is tested by the ODVA to ensure compatibility and interoperability.

Communication Node	Part Number
580 EtherNet/IP™ Node	P580AEEP1010A00
580 EtherNet/IP™ Node w/DIN Rail	P580AEEP1010DRM
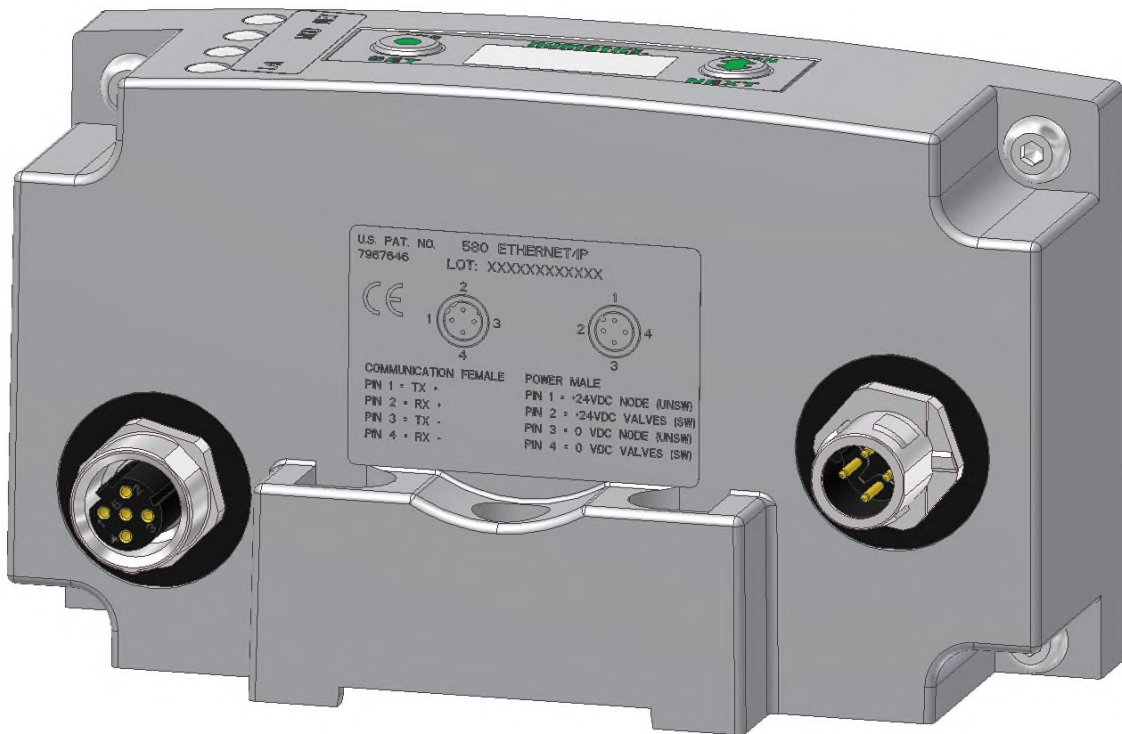
3.2   580 EtherNet/IP™ Node Description

Detail No.	Description
1	SET Button – used to navigate through user menus and to set parameters
2	Module Status LED
3	4 Pin M12 Female D-coded Communication Connector per ODVA specification
4	Mounting Hole
5	NEXT Button – used to navigate through user menus and to set parameters
6	Graphic Display – used to display parameter information
7	Network Status LED
8	4 Pin M12 Male Power Connector per ODVA specifications
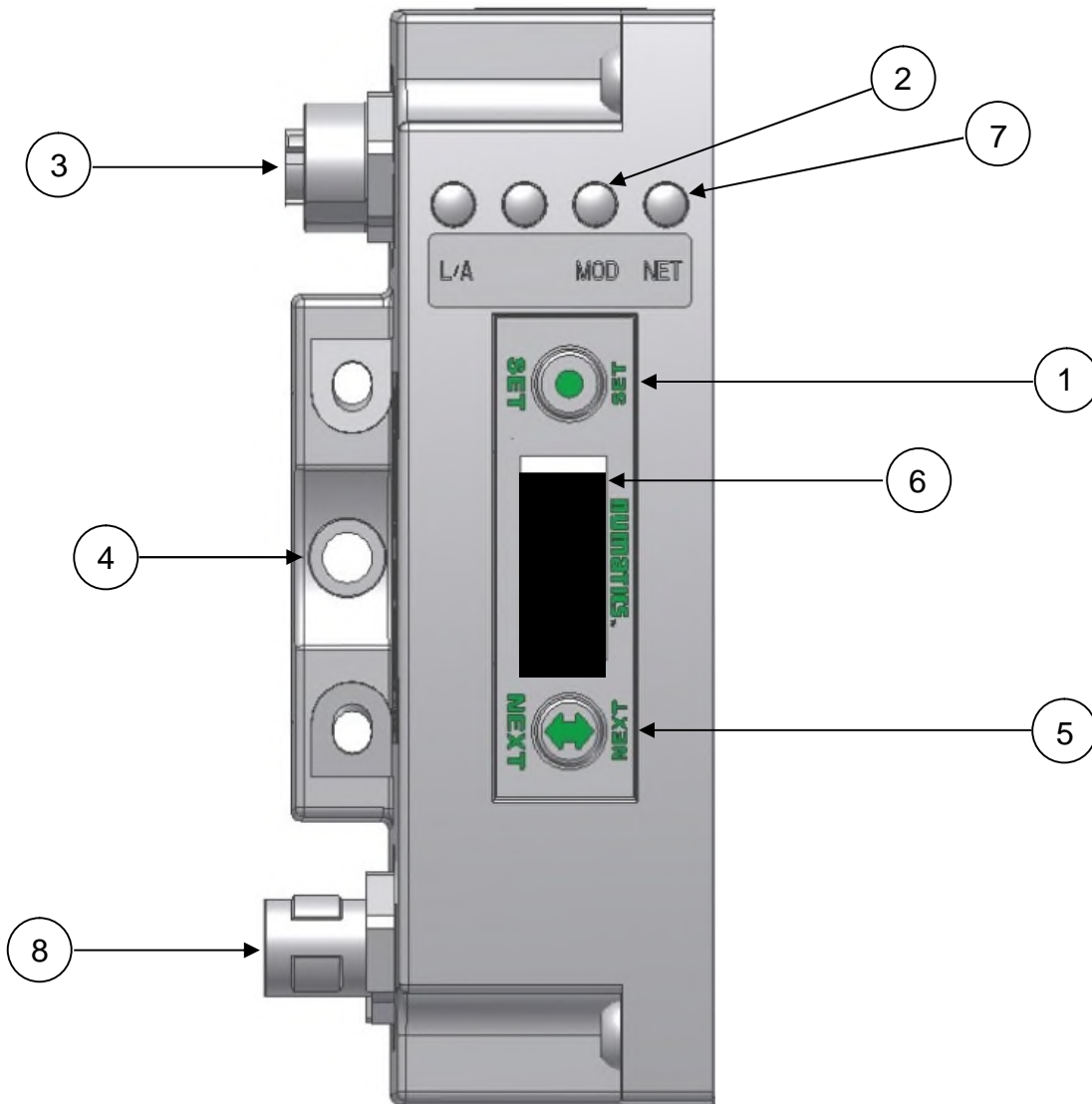
3.3   Connector Pin-Outs

Industry standard M12 connectors are used for communication and power.
The EtherNet/IP™ Communication connector is a D-Code 4 pin Female connector.
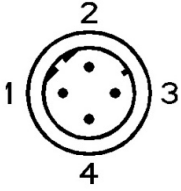The Power connector is a single keyway 4 pin male connector.

EtherNet/IP™ Communication Connector Pin-Out

Pin No.	Function	Description
1	TX+	Positive Transmit Line
2	RX+	Positive Receive Line
3	TX-	Negative Transmit Line
4	RX-	Negative Receive Line

Power Connector

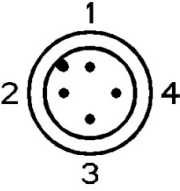| Pin No.	Function	Description
1	+24 VDC(Node)	Voltage used to power node electronics UNSW
2	+24 VDC(Valves)	Voltage used to power outputs (valve coils) SW
3	0 VDC Common(Node)	0 VDC (-V) Voltage used to power node electronics UNSW
4	0 VDC Common(Valves)	0 VDC Voltage used to power outputs (valve coils) SW

U.S. PAT. NO.   580 ETHERNET/IP
7967646   LOT: XXXXXXXXXXXX

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COMMUNICATION FEMALE   POWER MALE
PIN 1 = TX +   PIN 1 = +24VDC NODE (UNSW)
PIN 2 = RX +   PIN 2 = +24VDC VALVES (SW)
PIN 3 = TX -   PIN 3 = 0 VDC NODE (UNSW)
PIN 4 = RX -   PIN 4 = 0 VDC VALVES (SW)

! ATTENTION

- *Power common (0 VDC) pins 3 and 4 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 and +24VDC Node 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*

3.4   Electrical Connections

Power Connector Wiring Diagram Examples

Power Supply Example (Non-isolated commons)

Male connector view
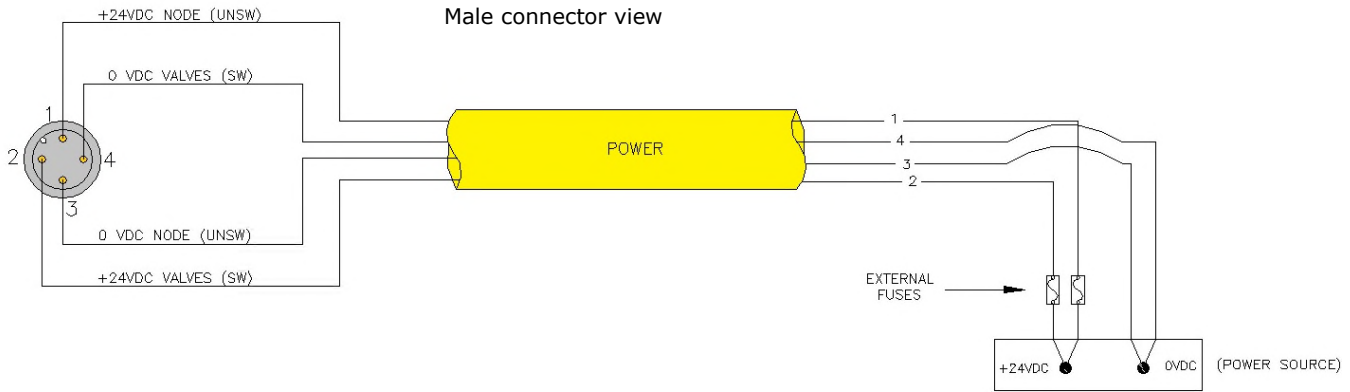
Power Supply Example (Isolated commons)

Male connector view
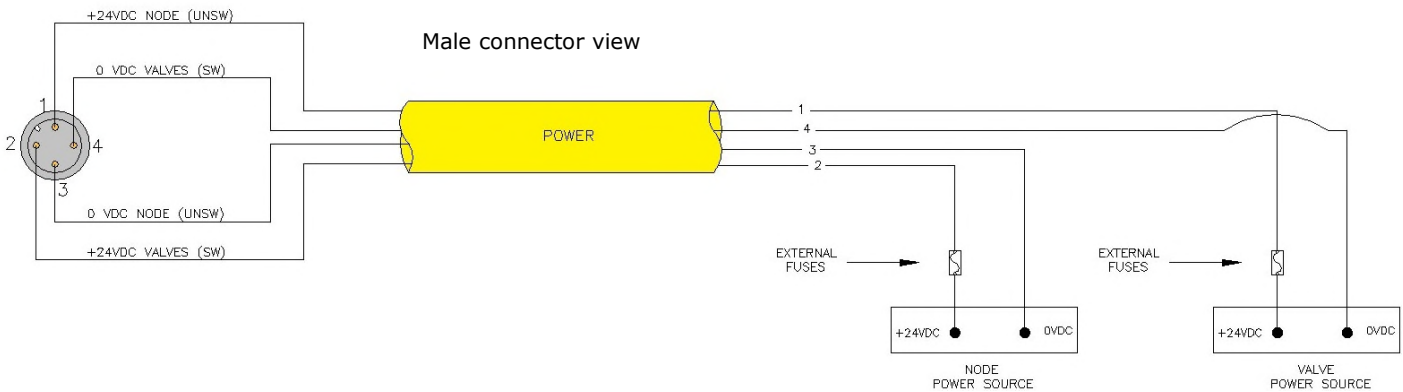
⚠ **ATTENTION**	• *Please see page 3-17 for external fuse sizing guide.* • *When using molded connector power cables, <u>Do Not</u> rely on wire colors for Pin-Out. <u>Always use pin number references.</u>* • *To be connected to a Class 2 power source only* • *Class 2 Device Wiring Only – Do Not Reclassify 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.

EtherNet/IP™ Straight-Through Cabling Diagrams

Straight-Through Ethernet cable is used when connecting an Ethernet node to a basic media component (router, switch, hub, etc.). Here are some basic wiring examples of Straight-Through cabling.

RJ45 to M12 D Coded Cable
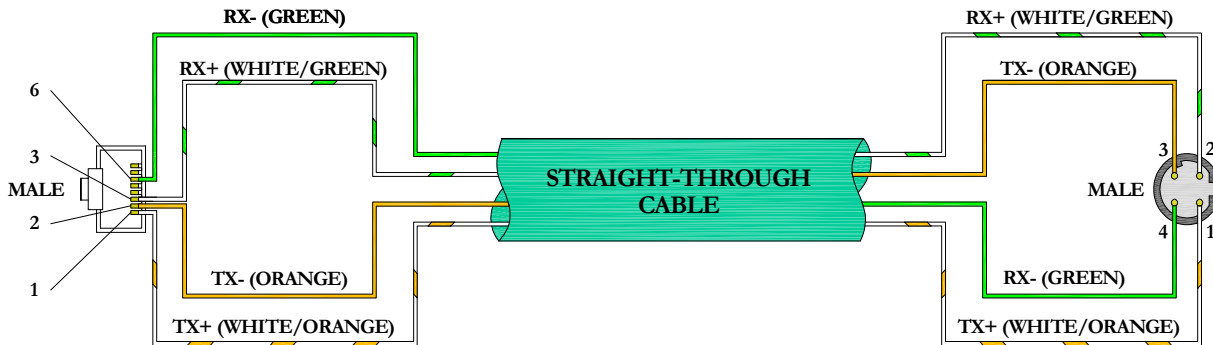
M12 D Coded to M12 D Coded Cable

NOTE!
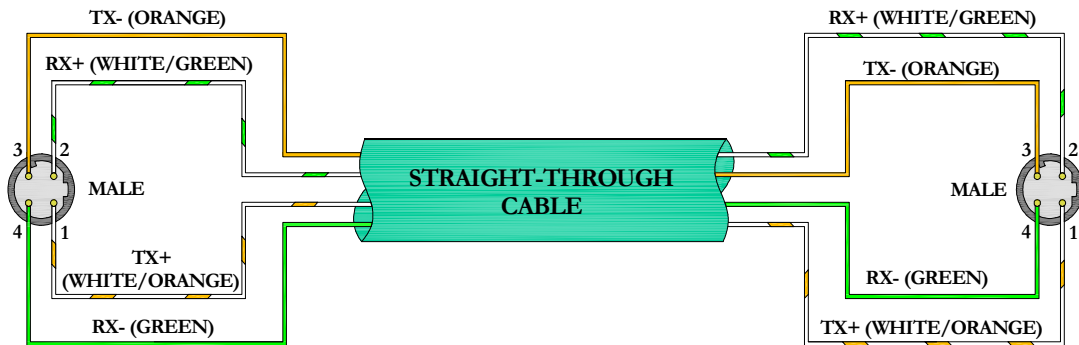
- *These are examples only. For appropriate network cabling information, please see the ODVA document titled, "EtherNet/IP™: Media Planning and Installation Manual".*

3.5 Chassis Ground

All ASCO Numatics 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
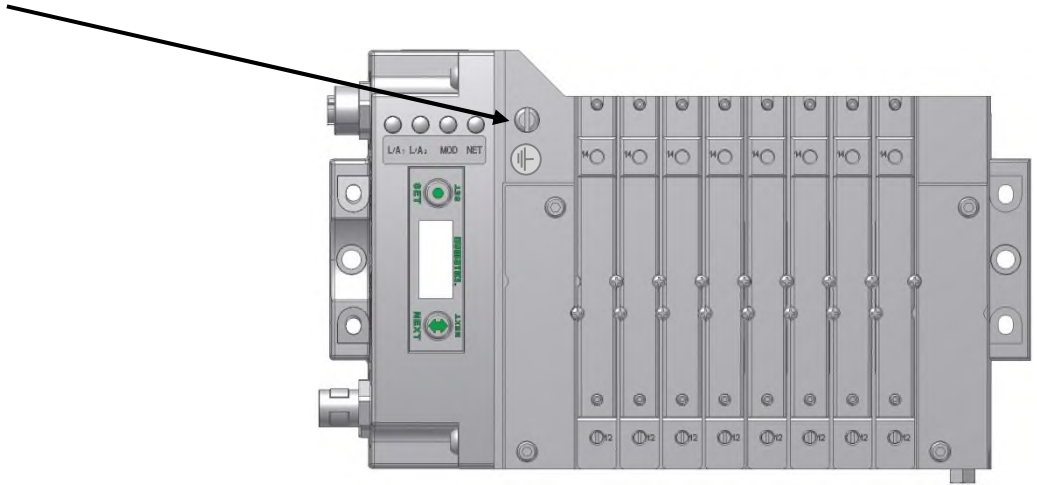
CHASSIS GROUND CONNECTION POINT, **502 & 503** VALVES

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.*

3.6   Power Consumption

Power Connection

Pin No.	Function	Description
1	+24 VDC (Node)	Voltage used to power node electronics UNSW
2	+24 VDC (Valve)	Voltage used to power outputs (valve) SW
3	0 VDC Common(Node)	0 VDC (-V) Voltage used to power node electronics UNSW
4	0 VDC Common(Valve)	0 VDC (-V) Voltage used to power outputs (valve) SW

Power Rating

- The maximum system current capability is 4 Amps. Care should be taken not to exceed 4 Amp draw through the M12 Power connector pins.

Component	Voltage	Tolerance	+24VDC (Valve) Pins 2 & 4		+24VDC (Node) Pins 1 & 3	
			Current Per Coil	Power Per Coil	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 EtherNet/IP™ Node	24 VDC	+/- 10%	NA	NA	0.09 Amps	2.2 Watts

3.7   Recommended External Fuses

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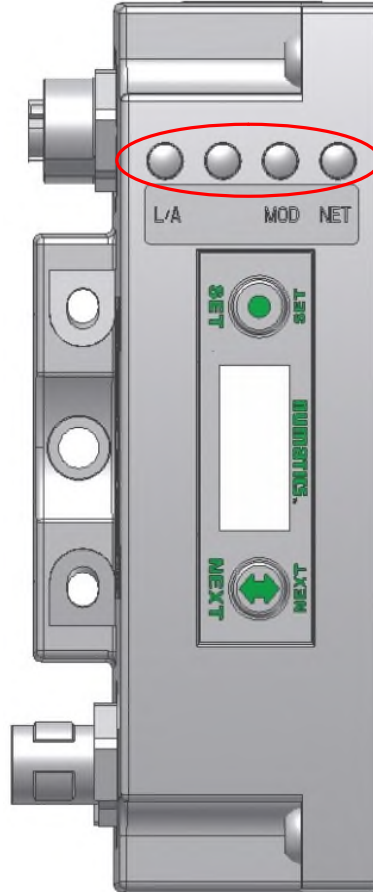
External Fuse Sizing Chart

Power Consumption - Power Connector Pin for VALVES			
Description			*Current*
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
Power Consumption – Power Connector Pin for NODE			
Description			*Current*
Communication Node Power Consumption	=		0.09 Amps
Surge Compensation:	X	1.25	
Suggested External Pin +24 VDC (Node) Fuse Value:	=		0.113 Amps

> **NOTE!**
> - *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.*

3.8 Diagnostics – 580 Node LED Functions

Upon power up, the Module and Network Status LEDs indicate the state of the unit. There are three LEDs on the 580 EtherNet/IP™ Interface. The LEDs functions are described in the table below.

LED Name	Color	Status	Description
MOD MODULE STATUS	Off	OFF	No power applied to +24V $_{NODE/IN}$.
	Green	ON	Device operational. The module is operating correctly.
		FLASHING	Standby. The module has not been configured.
	Red	ON	Major fault. A major internal error has been detected.
		FLASHING	Minor fault. A minor recoverable fault has been detected. Self -Test Mode - An error has occurred in the initialization process.
	Green Red	FLASHING	Self -Test Mode.
NET NETWORK STATUS	Off	OFF	IP address has not been assigned to node or no power applied to +24V $_{NODE/IN}$.
	Green	ON	Connected. The module has established an EtherNet/IP™ connection.
		FLASHING	No connection. There are no EtherNet/IP™ connections established to the module.
	Red	ON	Duplicate IP address. The module has detected that its IP address is already being used elsewhere on the network
		FLASHING	EtherNet/IP™ connection has timed out. One or more of the connections for which this module is the target has timed out.
L/A ACTIVITY/LINK	Green	OFF	No EtherNet connection is detected
		ON	The module is connected to an EtherNet network
		FLASHING	The LED flashes each time a packet is received or transmitted.

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3.9   Output / Short Circuit Protection Diagnostic Status Bits

Diagnostic Status Bit Action

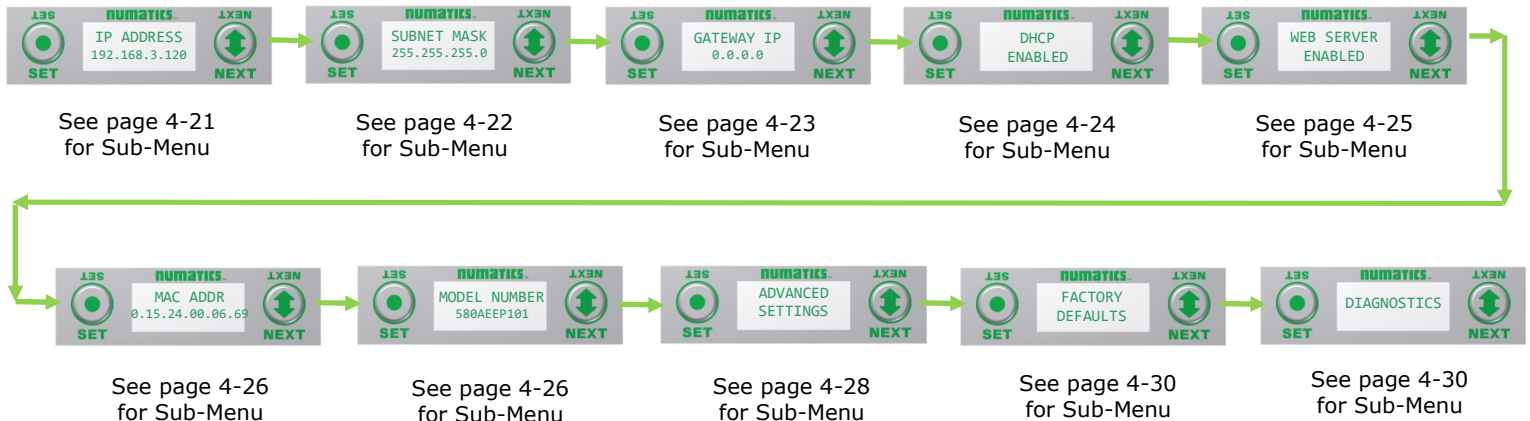| Output Type	Output State	Fault Condition	Status Bit
Valve Solenoid Coil Driver	ON	No Fault	0
		Fault - Short Circuit, Over Temp/Over Current	1
Valve Solenoid Coil Driver	OFF	No Fault	0
		Fault - Open Load	1

4. EtherNet/IP™ Node Graphic Display

The 580 EtherNet/IP™ Node has an integrated graphic display that may be used to configure the parameters of the Node as well as showing diagnostic information.
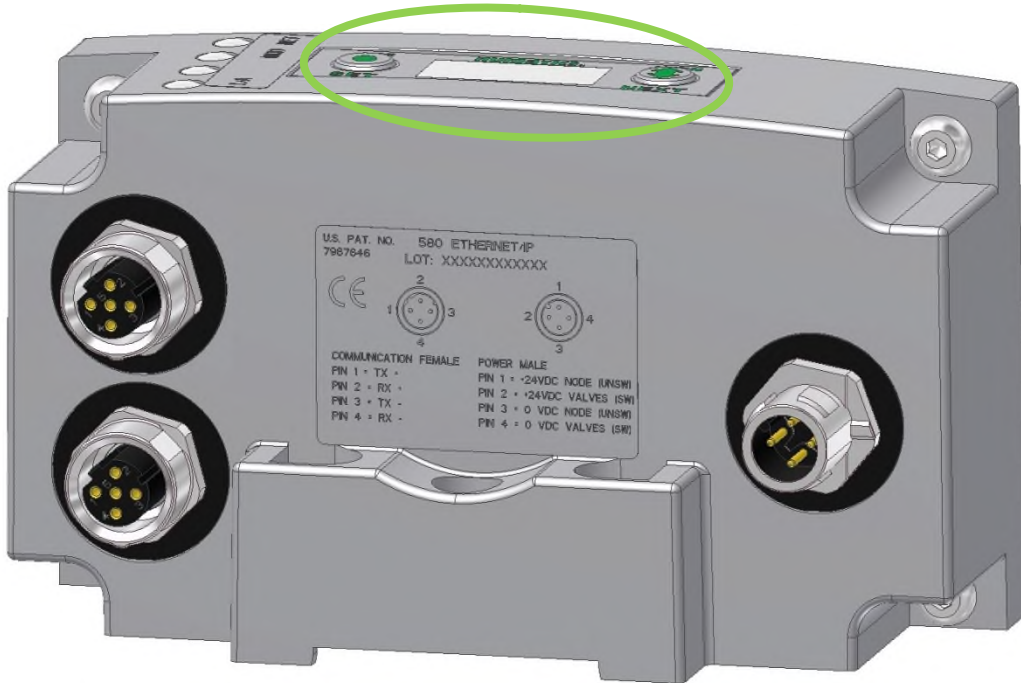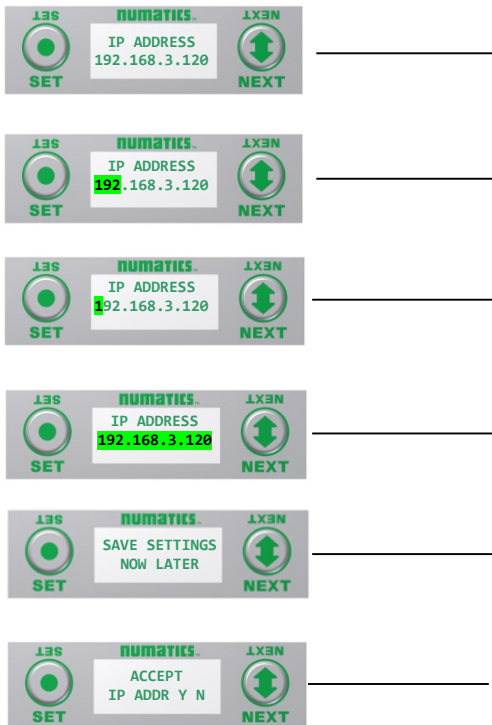

The following graphic displays represent the main menu selections of the 580 node. Use the NEXT button to scroll through the Main menu headings shown below. At this level pressing the SET button allows access to the Sub-Menus. Please see the appropriate pages referenced below for further details and descriptions of the Sub-Menus. Note that many of these settings can also be adjusted via software with EDS file parameters. *NOTE: WHEN A NETWORK I/O CONNECTION IS ESTABLISHED MANUAL CHANGES TO NODE PARAMETERS ARE NOT ALLOWED!*

Home Screen

SET — IP ADDRESS 192.168.3.120 — NEXT	SET — SUBNET MASK 255.255.255.0 — NEXT	SET — GATEWAY IP 0.0.0.0 — NEXT	SET — DHCP ENABLED — NEXT	SET — WEB SERVER ENABLED — NEXT
See page 4-21 for Sub-Menu	See page 4-22 for Sub-Menu	See page 4-23 for Sub-Menu	See page 4-24 for Sub-Menu	See page 4-25 for Sub-Menu

SET — MAC ADDR 0.15.24.00.06.69 — NEXT	SET — MODEL NUMBER 580AEEP101 — NEXT	SET — ADVANCED SETTINGS — NEXT	SET — FACTORY DEFAULTS — NEXT	SET — DIAGNOSTICS — NEXT
See page 4-26 for Sub-Menu	See page 4-26 for Sub-Menu	See page 4-28 for Sub-Menu	See page 4-30 for Sub-Menu	See page 4-30 for Sub-Menu

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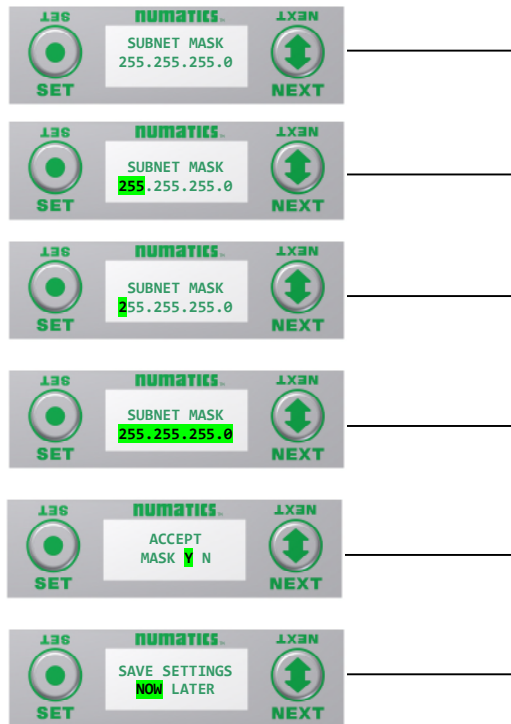## 4.1   IP Address Sub-Menu

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.

NOTE!
- Factory default address is 192.168.3.120
- 0 and 255 are not valid for the fourth octet

4.2 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.
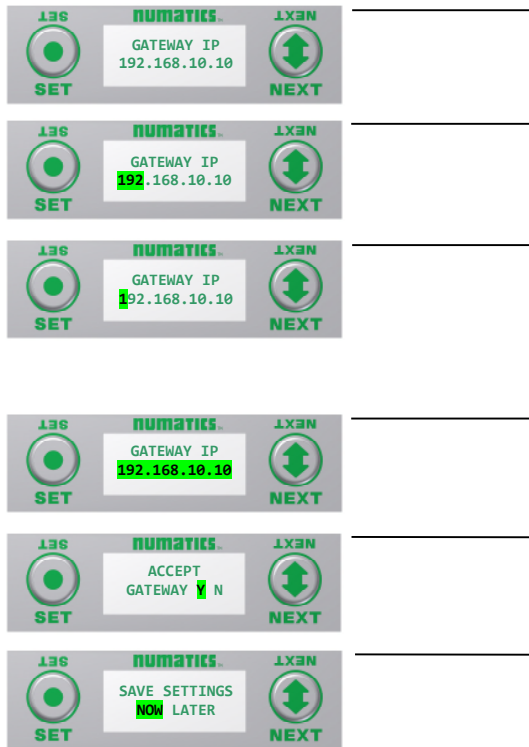
   Press the SET button to confirm your choice.

NOTE!
- Factory default subnet mask is 255.255.255.0

4.3   Gateway IP Sub-Menu

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 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 past the fourth octet to accept the entire Gateway IP

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 Gateway
    IP shown on the display.
    Selecting No will bring you back to the main Gateway IP 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.

4.4   DHCP Sub-Menu
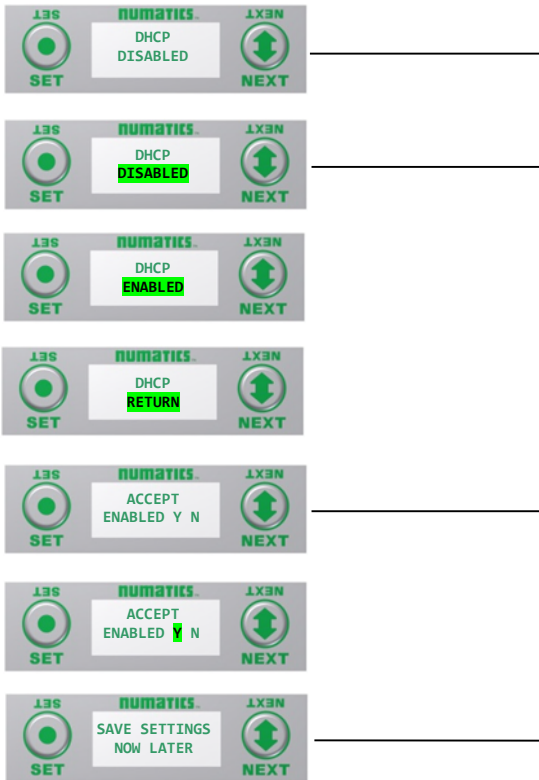
DHCP Steps

1. Press the SET button to enter the DHCP 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.
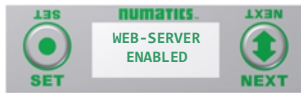
    Press the SET button to confirm your choice.

NOTE!

- Factory default setting for DHCP is enabled.

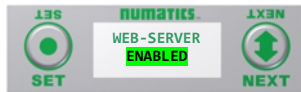## 4.5 Web Server Sub-Menu

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.
   - d. ENABLED (Factory Default)
   - e. DISABLED
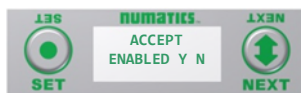   - f. RETURN (this will return you to the main menu)

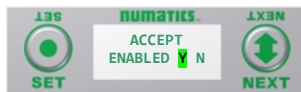   Press the SET button to confirm your choice.

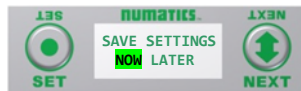3. Press the NEXT button to select Yes or No to accept the selection.
   - c. Selecting No will bring you back to the main menu.
   - d. Selecting Yes will take you to the following apply changes menu.

   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.

NOTE!

- Factory default setting for WEB-SERVER is enabled.
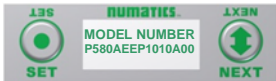
4.6 MAC Address Sub-Menu
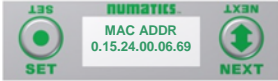
MAC (Machine Access Control) Address

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.

4.7 Model Number Sub-Menu

Model Number

1.   The Model Number is reference only.

4.8   Advanced Settings – Communication Fault

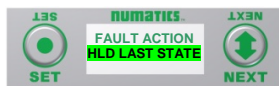### Communication Fault Settings

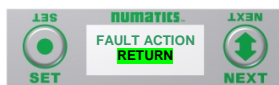1. Press the SET button to enter the ADVANCED SETTINGS sub-menu.

2. Press the SET button to enter the ADVANCED MENU / SET COMM. FAULT.

3. Press the NEXT button to scroll through the choices for Fault Action.
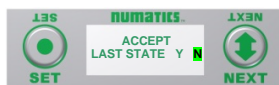
   a. OFF
   b. HOLD LAST STATE
   c. RETURN (this will return to the Fault Action sub-menu)

   Press the SET button to confirm your choice.

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

   a. Selecting No will bring you back to the Advanced Setting sub-menu.
   b. Selecting Yes will take you to the following Save Settings steps.

Save Settings Steps

5. Press the NEXT button to select either NOW or LATER.
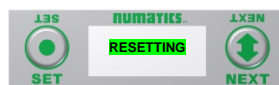
   a. Selecting NOW will cause the node to RESET and apply the selection.
   b. Selecting LATER will save the new selection in memory. You must accept the saved selection(s) before your next power cycle or it will be lost.

   Press the SET button to confirm your choice.

NOTE!

- Factory default setting for COMMUNICATION FAULT is OFF.

4.9   Advanced Settings – Flip Display
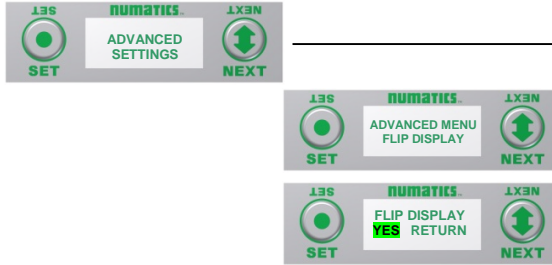
Flip Display Settings

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

2. Press the NEXT button to scroll to the ADVANCED MENU /FLIP DIAPLAY.
    Press the SET button to enter the ADVANCED MENU / FLIP DISPLAY.

3. Press the NEXT button to scroll the choices for flipping the LCD display for the Node 180 Degrees.

    a. YES
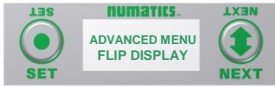   b. RETURN (this will return you to the ADVANCED menu)

    Press the SET button to confirm your choice.

4.10   Advanced Settings - Parameters
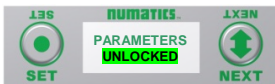
Parameter Steps

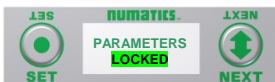1. Press the SET button to enter the Parameters sub-menu.

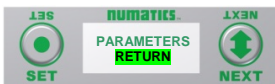2. Press the NEXT button to scroll to the ADVANCED MENU / PARAMETERS.

3. Press the SET button to enter the PARAMETERS sub menu.

4. Press the NEXT button to scroll through the choices to enable or disable the feature.
    a.   UNLOCKED (Factory Default)
    b.   LOCKED
    c.   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
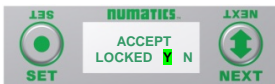
5. Press the NEXT button to select **Y**es or **N**o to accept the selection.
    a.   Selecting **N**o will bring you back to the main menu.
    b.   Selecting **Y**es will take you to the following apply changes menu.
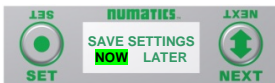
    Press the SET button to confirm your choice.

Apply Changes Steps
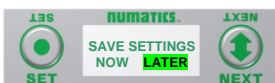
6. Press the NEXT button to select either NOW or LATER.
    a.   Selecting NOW will cause the node to reset and apply the new setting.
    b.   Selecting LATER will cause the new setting to be saved in memory, you must accept the saved changes before your next power cycle otherwise they will be lost.

    Press the SET button to confirm your choice.

4.11 Factory Defaults
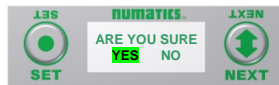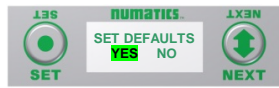
Factory Default Settings

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

2. 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.

Press the SET button to confirm your choice.

FACTORY DEFAULT SETTINGS	
Description	Default
IP Address	192.168.3.120
Sub Net Mask	255.255.255.0
Gateway Address	0.0.0.0
COMM Fault	Reset to All Off
Flip Display	Normal
Parameters	Unlocked

4.12 Diagnostics
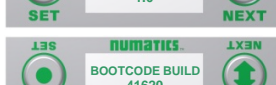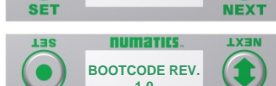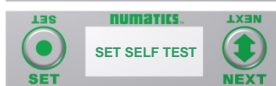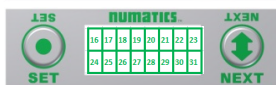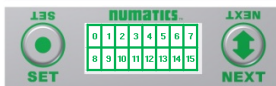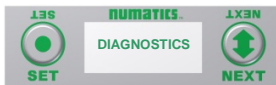
All diagnostic information is read only

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.

4.13   Diagnostics - Self Test Mode

An internal diagnostic tool can be enabled on the 580 (node) using the graphic display. This tool allows the user to confirm that all of the outputs (coils), on the manifold are fully functional without needing 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 these steps to initiate the SELF TEST MODE for either "OUTPUTS", or "MANUAL".

CAUTION

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.
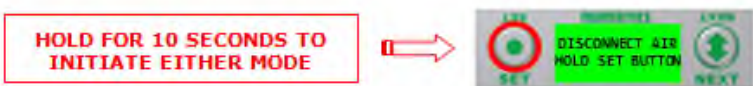7) A message will appear: DISCONNECT AIR HOLD SET BUTTON
8) Hold the SET button down for approximately 10 seconds to enable the test. The Display will flash DISCONNECT AIR HOLD SET BUTTON while the button is pushed.
9) When the display stops flashing, the SELF TEST MODE will run and the Module Status LED will flash Red/Green while the display identifies the chosen test mode running.

Returns to the Diagnostic tab Sub-Menu.

HOLD FOR 10 SECONDS TO INITIATE EITHER MODE

"OUTPUTS"

The connected outputs will cycle every 0.5 seconds.

Push to Energize flashing coil output

Push again to De-energize

NOTE!

A Power Cycle is required to Deactivate SELF TEST MODE

"MANUAL"
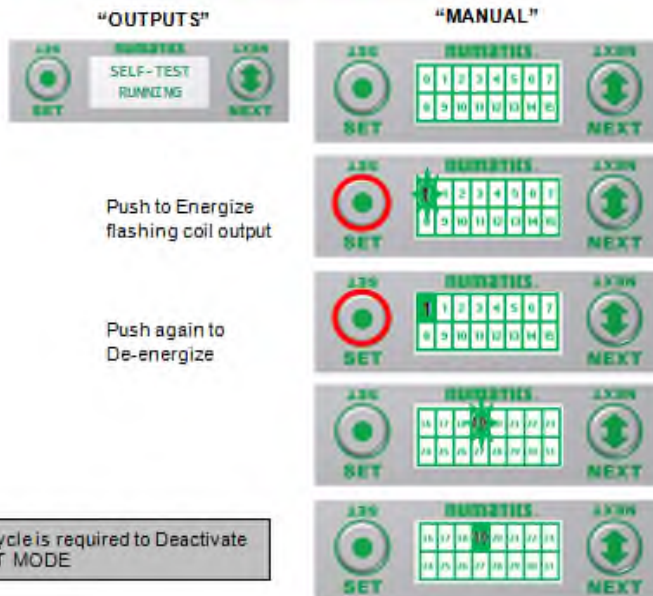
The first (16) available coils (outputs) will appear. There are a total of (32) coils that can be individually or simultaneously energized. . If less than 32 coils are present, there will be some delay before the next cycle.

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 flash until the cursor is moved and then it will remain solid to indicate an actuated coil. 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.

4.14   Error Messages

The following are automatic error messages that are displayed when specific faults occur during operation:
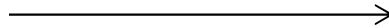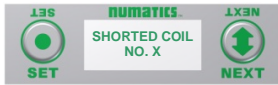
   ⟶   Displayed when a short circuit condition is detected on a valve coil.
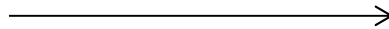
   ⟶   Displayed when +24 VDC on Pin No. 2 Valves (SW) and Pin No. 4 Valves (SW) is not present.
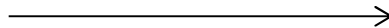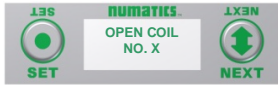
   ⟶   Displayed when an open circuit condition is detected on a valve coil.

5.   EtherNet/IP™ Configuration and Mapping

5.1   EDS File

The EDS file contains configuration information about the ASCO Numatics valve manifold. EDS files are available on the ASCO Numatics website at www.asco.com/g3.
When configuring a Rockwell PLC to communicate with a 580 EtherNet/IP™ manifold use Rockwell's RS Logix 5000 "Generic Ethernet Module" (refer to page 38).

5.2   Connecting to a 580 EtherNet/IP™ Node

This section will discuss how to connect a computer to a 580 EtherNet/IP™ 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 580 EtherNet/IP™ node (refer to page 12).

2. Connect a crossover cable directly from the manifold to the computer -OR- Connect a straight-through cable from the manifold to a router, hub, or switch. Next, connect a straight-through cable from the computer to the router, hub, or switch. (Network lights should appear on the router, hub, or switch if the correct cables are used).

3. Turn on the computer. Also, make sure the manifold and the router, hub, or switch has power.

4. To communicate with an EtherNet/IP™ manifold, the IP address of your computer must be known.

5. Once the IP address for the computer is known, you can set the IP address of the ASCO Numatics manifold using one of the methods described on page 40 .

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 ASCO Numatics EtherNet/IP™ manifold.

5.3   Using the Functionality of the 580 EtherNet/IP™ Web Server

This section will discuss the functionality of the built in Ethernet server. Every ASCO Numatics EtherNet/IP™ node has this feature. Through this server you can configure the node, force outputs (valves), check diagnostics, etc. Each ASCO Numatics webpage will be explained.

Home

To get to the ASCO Numatics "Home" page, open a web browser. In the URL line, type in the IP address of the manifold and press "Enter". The ASCO Numatics "Home" page will appear. This page shows a picture of the ASCO Numatics EtherNet/IP™ manifold(s). From this page, the user can navigate the entire built-in web server.
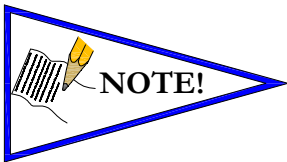
NOTE!	• *The 1ˢᵗ three octets of the IP address of the computer MUST match the IP address of the node.*

Node Configuration

The "Node Configuration" window can be used to control different parameters within the manifold. These parameters include, "IP Address", "Subnet Mask", "Gateway Address", "SMTP Server", "DHCP/BOOTP enabled", "MAC Address", and "COMM Fault/Idle Mode". "DHCP/BOOTP enabled" is controlled by a single check mark box. "COMM Fault/Idle Mode" has two options that can be chosen: "Hold last Output State" and "Turn OFF All Outputs".

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

Node Password

The "Node Password" window allows the user to set a password that will prevent unwanted access to the I/O Force and Test feature of the Diagnostic window, and the Node Configuration window. The password comes disabled from the factory. To set the initial password, leave the "Enter Current Password" field blank and type in the password in the "Enter New Password" field.

Once a Password has been set, the security check screen will appear when trying to enable outputs on the DIAGNOSTIC window (Valve Outputs), as well as trying to change parameters on the NODE CONFIGURATION window.
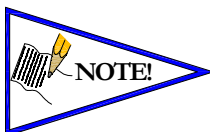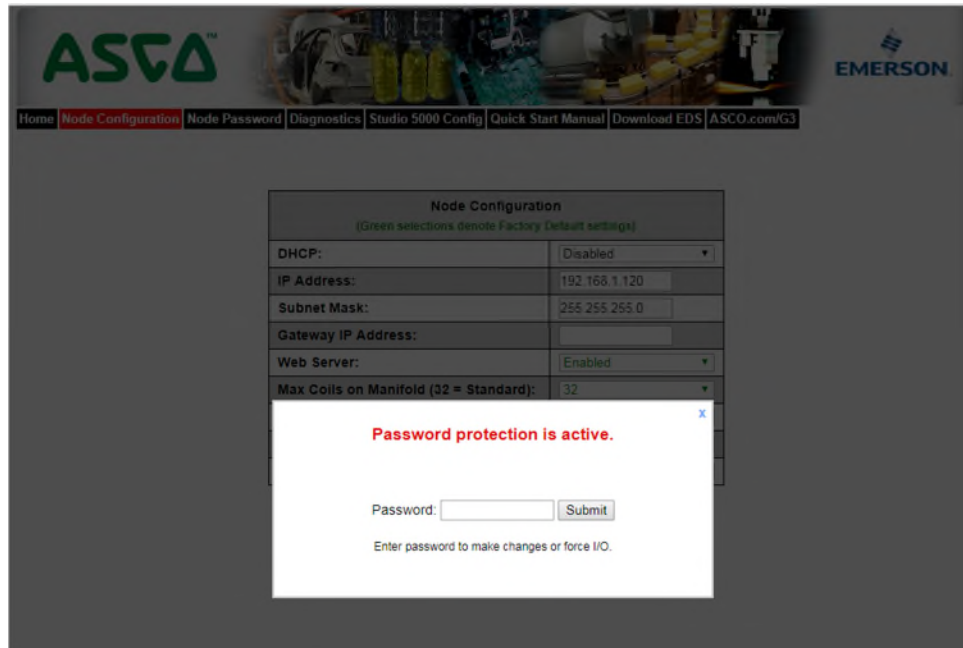
NOTE!	• If the password has been lost or forgotten, go through the process of changing the password. Enter the last 6 digits of the MAC Address in the current password field and then enter the desired password in the new password field.

Diagnostics

The "Diagnostics" window allows the user to monitor different values. These values include, "MAC Address", "Serial Number", "Firmware Revision", and "Valve Diagnostic Table". The "Valve Diagnostic Table" enables the user to check the status of the valve side outputs.

Graphic of module

Reports module status:

✔ = OK
! = Attention
✗ = Lost comm.

Relevant node information including firmware revision

Diagnostic Word

Mapping position of "Diagnostic" word.

Error / Event Log:

Allows user to clear log

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

Allows user to add comments

Reboot events are shown in red

RSLogix 5000 Config.

The "RSLogix 5000 Config." window provides the necessary information that is needed when configuring the 580 EtherNet/IP™ manifold as a "Generic Ethernet Module" with RSLogix 5000 (refer to page 5-42).

Home | Node Configuration | Node Password | Diagnostics | **Studio 5000 Config** | Quick Start Manual | Download EDS | ASCO.com/G3

Configuration with Studio 5000

When commissioning your EtherNet/IP network, specific values must be entered into the "Module Properties" window for the nodes. The "Connection Parameters" section requires user supplied data for "Input Size", "Output Size", and "Configuration". The table below details all pertinent information and is also dynamic, thus the "*Size*" data is based on the current/actual configuration of the manifold. It contains the appropriate values for the module's *Connection Parameters* selections.

The sample screenshot is taken from Rockwell Automation's Studio 5000 programming software. It shows where the appropriate values for the IP Address, Assembly Instance, Size, and Configuration must be entered.

Module Properties Based on Actual Configuration

Connection Parameters				
Description	**Assembly Instance Value**	**Comm Format**	**Size**	**Notes**
Input	101 (Decimal)	Data-SINT With Status (8 bit)	1	The *Size* values are determined from the number and type of I/O modules that are installed on the manifold (actual physical configuration). These values are shown in the *Size* column on the left and are for the specific *Comm Format* selected. This is a minimum value. Larger values may be specified but may affect overall network throughput.
		Data-INT With Status (16 bit)	1	
		Data-DINT With Status (32 bit)	1	
Output	150 (Decimal)	Data-SINT With Status (8 bit)	4	
		Data-INT With Status (16 bit)	2	
		Data-DINT With Status (32 bit)	1	
Configuration	1 (Decimal)	ALL	0	
Status Input	110 (Decimal)	Data-SINT With Status (8 bit)	6	
		Data-INT With Status (16 bit)	3	
		Data-DINT With Status (32 bit)	2	
Status Output	193 (Decimal)	ALL	N/A	

Sample screenshot from Rockwell Automation's Studio 5000 programming software
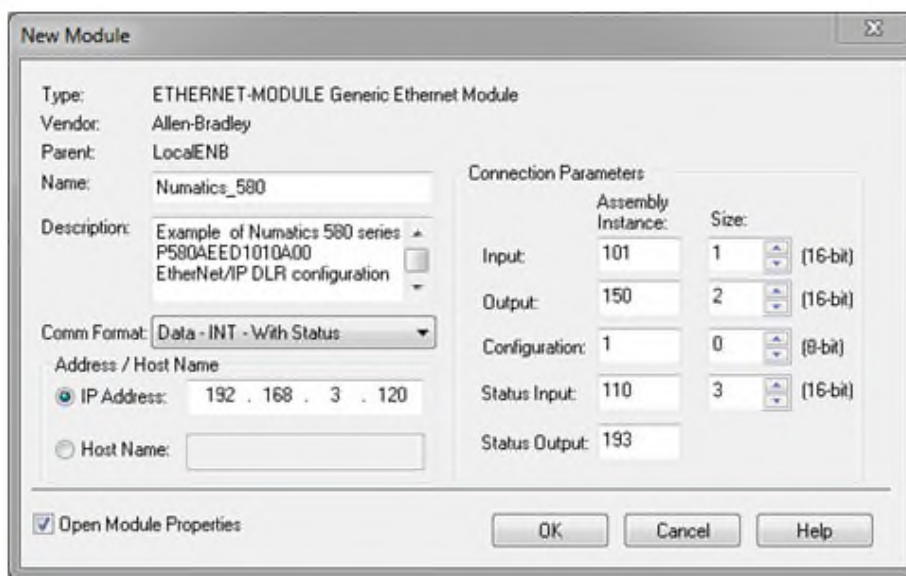
Quick Start Manual

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 **www.asco.com**. It provides the basic information for the user to connect and configure the 580 EtherNet/IP™ Node and Manifold.

Download EDS

The "Download EDS" tab provides a link to download either the embedded EDS file in the node or the EDS file available on the ASCO Numatics website.

ASCO.com

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

5.4   IP Address Configuration

The IP address of the ASCO Numatics 580 EtherNet/IP™ node may be configured via several different methods:

- DHCP
- Integrated Web Page Configuration
- Graphical display

DHCP

The node is shipped from the factory with the DHCP/BOOTP feature enabled. This allows a DHCP server to automatically set the IP address to the node when connected to the network, or a BOOTP server to establish communication to the node and set the IP address. These addressing methods require that the unique MAC ADDRESS of the node is known. The MAC ADDRESS is displayed on the graphical display of the node. It will be different for every node. When DHCP/BOOTP is enabled and a DHCP server is found, the IP address, Subnet mask, and gateway are automatically configured by the DHCP server.
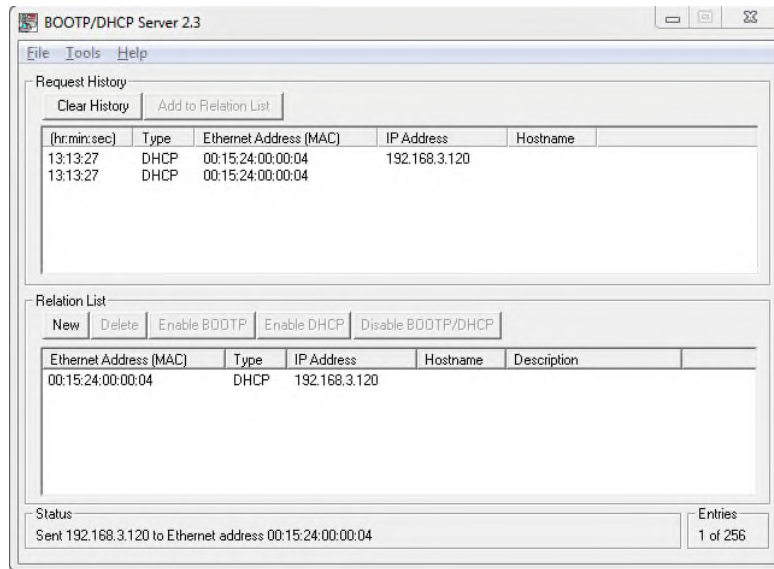
The DHCP setting can be enabled or disabled via the nodes integrated web server or graphical display.

Integrated Web Page Configuration

The ASCO Numatics EtherNet/IP™ node has an integrated web server. This server can be accessed via any standard web browser program. With the IP Address, the "Node Configuration" page for the node can be called up and the configuration parameters updated. Please note that the PC, where the web browser is installed, must be correctly configured for operation with the appropriate network IP ranges and Subnet settings that match the EtherNet/IP™ node.

ATTENTION

- *Consult appropriate personnel before changing your computer's network settings and always record previous settings for later reversal before attempting changes.*

Below is a representation of the "Node Configuration" page which is stored in the EtherNet/IP™ node.
IP address, Subnet Mask, and DHCP enabled 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)	
DHCP:	Disabled ▼
IP Address:	192.168.1.120
Subnet Mask:	255.255.255.0
Gateway IP Address:	
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

Graphic Display

Please see page 4-20 for graphical display settings

ATTENTION

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

5.5 Configuration with RSLogix 5000

When commissioning your EtherNet/IP™ network, specific values must be entered into the "Connection Parameters" section of the "Assembly Instance" and "Size" column. Below is a sample screenshot taken from Allen-Bradley's RSLogix 5000 programming software. It shows where the appropriate values for the *IP Address, Assembly Instance, Size,* and *Configuration* must be entered.
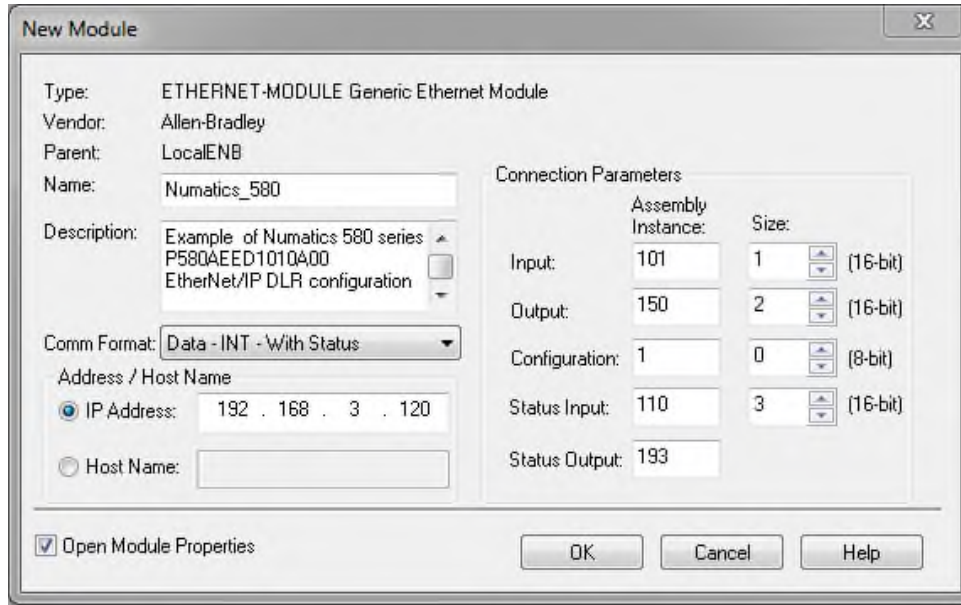
Module Properties

Connection Parameters

Comm. Format	Description	Assembly Instance	Size
Data – DINT - With Status	Input	101	1
	Output	150	1
	Configuration	1	0
	Status Input	110	2
	Status Output	193	-
Data – INT - With Status	Input	101	1
	Output	150	2
	Configuration	1	0
	Status Input	110	3
	Status Output	193	-
Data – SINT - With Status	Input	101	1
	Output	150	4
	Configuration	1	0
	Status Input	110	6
	Status Output	193	-

5.6   User Configurable Device Parameters

The ASCO Numatics 580 EtherNet/IP™ 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. All of these configurable parameters can be adjusted using the built-in web server and graphic display

Name	Description	Display	Web Server
IP Address	Node address	√	√
DHCP Boot-P	Enables / Disables DHCP/Boot-P functionality	√	√
Web Server	Web Server Enabled	√	√
Output Comm. Fault Action	Determines whether to use idle value attribute or hold last state	√	√

5.7 Communication Fault/Idle Mode Parameter

This parameter is used to set the behaviors of output points (bits) during a communication fault or an "idle" event (when a PLC is in "Idle mode" not in RUN mode). The parameter shown below is used to determine what state/action the outputs (coils) will have during an "Idle" event and a "Fault" event. It will allow control of all output points, valves, on the manifold.

The user, through the graphic display or software, can determine how the outputs (coils) behave when a communication fault or idle actions occurs. These settings are non-volatile and thus will not change upon loss of power.

The two behavior options are:

1. Hold Last State of Outputs
2. Turn Off All Outputs

5.8 Communication Fault/Idle Mode Sequence

The Communication Fault/Idle Mode parameter determines the output state/action if the device encounters a communication fault and/or idle condition. A Communication Fault is defined as an inability for the master node to communicate with a slave node on a network. Idle Mode is a condition when the processor is in program mode.

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.
3. If the attribute is set to turn off all outputs, all of the outputs (coils) will turn off (Factory Default Setting).
4. If the attribute is set to hold last state, all of the outputs (coils) will hold their last state.

```
                        ┌─────────────────────┐
                        │   Communication     │
                        │   Fault Received    │
                        └─────────────────────┘
                                   │
                                   ▼
┌──────────────┐            ◇─────────────◇            ┌──────────────┐
│  Turn OFF    │◄───────────    Device       ───────────►│ Hold Last    │
│  All Outputs │            │   Checks     │            │   State      │
└──────────────┘            │ Communication│            └──────────────┘
        │                   │    Fault     │                   │
        ▼                   │  Attribute   │                   ▼
┌──────────────┐            ◇─────────────◇            ┌──────────────┐
│   Outputs    │                                       │   Outputs    │
│  De-Energize │                                       │   Do Not     │
└──────────────┘                                       │ Change State │
                                                       └──────────────┘
```
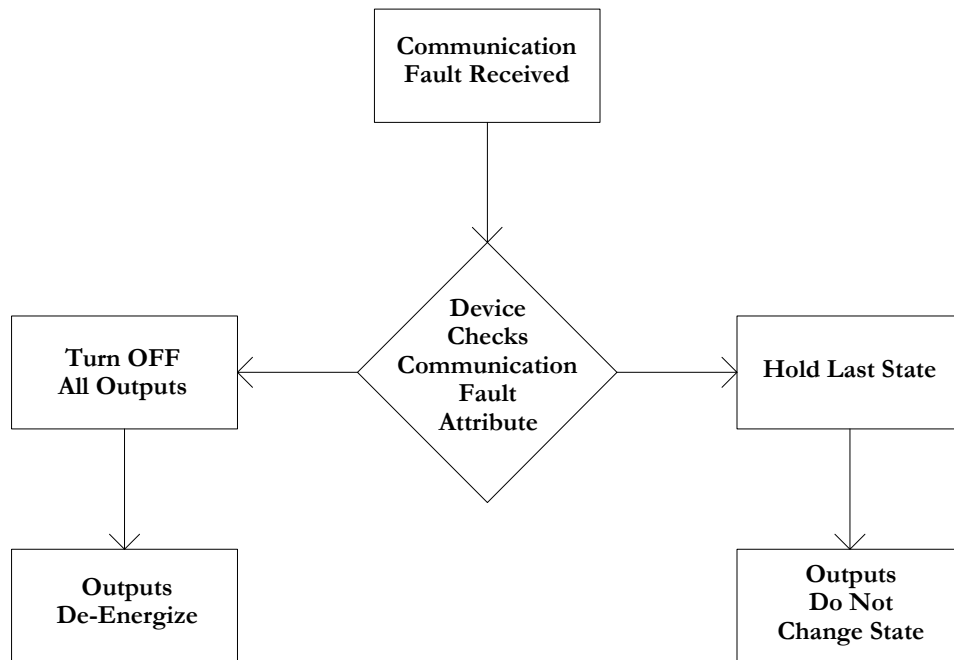
6. EtherNet/IP™ Mapping

6.1 I/O Sizes - Rx/Tx

Outputs (Valves)

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

Inputs (Status)

Inputs are defined as status bits (i.e. status input bits produced by output (valve) drivers, and Diagnostic Word information). Therefore, the input size represents only Status information. Both the Status Inputs and the Diagnostic Word data are non-settable. Please reference the following pages for a detailed mapping.

Total I/O Size

The total I/O size of the 580 EtherNet/IP™ manifold is fixed: Rx = 6, Tx = 4.

6.2 Bit Mapping Rules

The following is a description of the bit mapping rules associated with the ASCO Numatics 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) Each solenoid coil output has an associated status input bit (refer to the section labeled, "Output Short Circuit Protection", on page 3-19 for functional details).

4) Solenoid coil output addressing begins at the 1st manifold station nearest the node, using the "14" coil 1st and then, if applicable, the "12" coil, and continues in ascending order away from the communication node.

5) 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.

6) 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.

NOTE! *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.*

6.3   Mapping Example No. 1

Assumed Settings

- Double Z-Boards™ used with all valves
- Diagnostic Word is present (non-settable)
- 32 coils (4 Bytes) allocated (non-settable)

Manifold I/O Configuration

Description	In	Out
	Bytes	
Diagnostic Word	2	0
Local Valve Size:	4	4
Total:	6	4

How to Order

Qty	Part Number
1	8501AV8H100VA00
4	R501A2B40MA00F1
1	H501AMM4BMA0010
4	R501A2B40MA00F1
1	H501AMM4BMA0010
1	P580AEEP1010A00
	ASSEMBLED
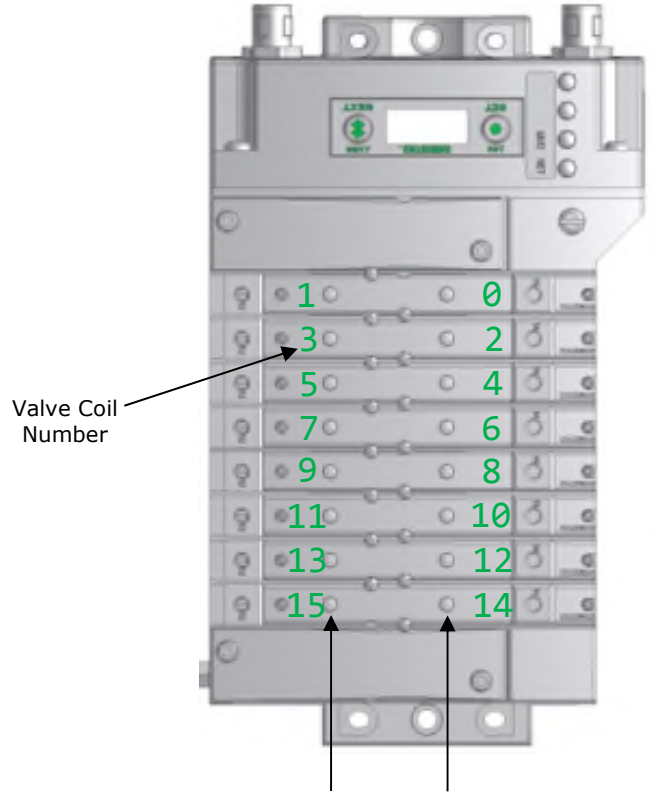
Valve Coil Number

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

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

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 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

6.4   Mapping Example No. 2

Assumed Settings

- Double Z-Boards™ used with all valves
- Diagnostic Word is present (non-settable)
- 32 coils (4 Bytes) allocated (non-settable)

Manifold I/O Configuration

Description	In	Out
	Bytes	
Diagnostic Word	2	0
Local Valve Size:	4	4
Total:	6	4

How to Order

Qty	Part Number
1	8501AV8H100VA00
4	R501A2B10MA00F1
1	H501AMM4BMA0010
4	R501A2B10MA00F1
1	H501AMM4BMA0010
1	P580AEEP1010A00
	ASSEMBLED
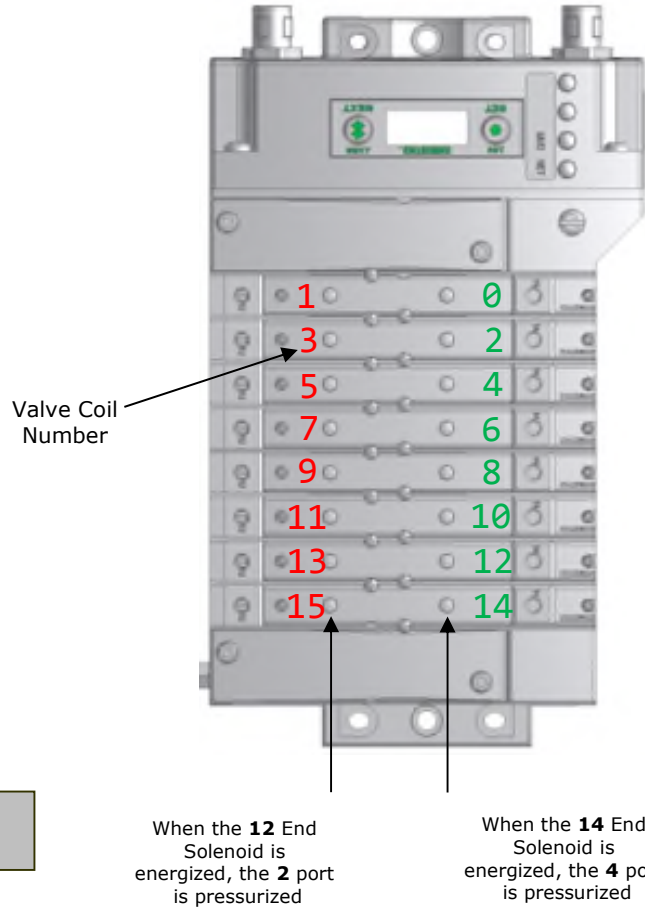
NOTE! *Coils identified in RED are allocated and reserved; refer to mapping table below.*

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

BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
				Output Table				
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

BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
				Status Table				
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

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6.5   Diagnostic Word

BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0 (Comm. Status)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Switched Power Status (1=Error)
1 (Reserved)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

Diagnostic Word Format

Byte 0 (Communication Status)

Byte 0, Bit 0 Switched Power Status = Bit is high when valve (output) power is not present on the comm. module.

7. Appendix

7.1 System Specifications

Electrical	
Supply Voltage	Valves (501, 502, 503): 24 VDC ± 10% Node: 24 VDC ± 10%
Current	Total current on the Power Connector ("Valves" and "Node" Pins) must not exceed 4 Amps.
Reverse Polarity	Reverse polarity is protection is provided on both Node and Valve power.
Recommended External Fuse	External fuses should be chosen depending upon manifold configuration. Please refer to power consumption chart on page 3-17 for additional fuse sizing information.
Spike Suppression	Output spike suppression is internally provided for 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)

7.2 Factory Default Settings

FACTORY DEFAULT SETTINGS	
Description	Default
IP Address	192.168.3.120
Sub Net Mask	255.255.255.0
Gateway Address	0.0.0.0
Communication Fault	Reset to All Off
Flip Display	Normal
Parameters	Unlocked

7.3   Troubleshooting

Communication Node

Symptom	Possible Cause	Solution
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.
Valve outputs do not energize.	Output power not present or connected improperly on Power connector.	Check for 24VDC on the +24 VDC (Valves) pin of the M12 Power connector of the 580 Node.

7.4   Glossary of Terms

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

Term	Description
Address Resolution Protocol (ARP)	A protocol used to set an IP address using a MAC Address hardware address. This can be done in the command prompt window.
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.
Bootstrap Protocol (BOOTP)	A protocol used to set an IP Address, Subnet Mask, and Gateway using a server.
Broadcast	A transmission method that sends packets to multiple unspecified devices.
Byte	8 bits (1/2 word)
Comm. Fault	One or more of the I/O connections have timed out.
Discrete I / O	The inputs / outputs that are available via the "Discrete I/O" side of manifold.
Dynamic Host Configuration Protocol (DHCP)	A protocol used by a node to obtain an IP Address, Subnet Mask, and Gateway Address from a server.
EDS File	Electronic Data Sheet. A text file, which contains specific product information, definitions of product capabilities and configurable parameters necessary for operation on an EtherNet/IP™ network.
Explicit Messaging	Messaging that sends data to perform request/response functions.
Ground	This term is used to indicate an earth or chassis ground.
I/O	Any combination of inputs and outputs
Idle	A zero (0) length poll message (i.e.: scanner in program mode)
IGMP Snooping	See Implicit Messaging
Implicit Messaging	A function that that can control I/O messaging to another I/O device.
Internet Group Management Protocol (IGMP)	A protocol used to keep local switches informed in a multicast group. Nodes that leave the group will no longer be sent packets of information from switches and routers.
Layer 2 (data link layer or level)	The data layer that physically refers to the frame format and addressing. A layer 2 address is an Ethernet address.
Layer 3 (network layer or level)	The data layer that refers to IP and the IP packet format. A layer 3 address is an IP address.
Link	A group of nodes with different MAC addresses. Segments connected by repeaters make a link. Links that are connected by routers make up a network.
MAC Address	Media Access Connection Address
Multicast	A transmission where a packet is sent to all possible nodes of a certain subset.

7.4   Glossary of Terms Cont.

Term	Description
NEMA	National Electrical Manufacturers Association
Network	A group of nodes connected by a communication medium through repeaters, router, and gateways.
Node	A device on the network that contains a single MAC Address, which can communicate over a subnet.
Octet	8 bits of information. An IP address is made up of four octets.
ODVA	Open DeviceNet Vendor Association (www.odva.org)
Ping	A group of messages sent between a master and a slave that coordinates time.
Ping Request	A request to see if a device has received a message.
Ping Response	Response to a ping request.
Requested Packet Interval (RPI)	The frequency measure of the required transmission of data from the originating device to the target device.
RSNetWorx	Rockwell Automation's configuration software
Segment	Nodes connected to a continuous section of communication media.
Simple Network Management Protocol (SNMP)	A protocol used to monitor EtherNet devices, switches, routers, and networks connected by communication media.
Sinking (NPN)	Method of connecting electrical circuits in which the zero (0) volt DC side is switched and the common is positive
Sourcing (PNP)	Method of connecting electrical circuits in which the positive side is switched and the common is zero (0) volts DC.
Status Input bit	A bit in the input table that reports the health of a corresponding output. Indicates short circuit or open coil (load) diagnostics
Subnet	Nodes using the same protocol and shared media access arbitration.
System	Contains one or more domains.
Time to Live (TTL)	A method used in best-effort delivery systems to negate endlessly looping packets.
Unicast	A transmission where a packet is sent to a single node.
Word	2 Bytes (16 bits)
Z-Board™	Circuit board installed in the valve manifold which electrically connects the valve solenoid to the electrical /electronics interface. Available in single or double solenoid versions.

7.5   Technical Support

For technical support, contact your local ASCO Numatics distributor. If further information is required, please call ASCO Numatics 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 ASCO Numatics products and support issues can be found on the ASCO website at www.asco.com.