

**2500P-JACP V2.00 Firmware
Upgrade & Networking Setup Guide**

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Revision History		
Rev	Date	Description
0.1	06MAY2026	Initial document creation
0.2	24JUL2026	Initial release
0.3	27JUL2026	Added note in Operational Notes for V2.00 Networking that Modbus, CAMP, MQTT, Binding, Workbench can use any configured IP address
0.4	07AUG2026	A few minor updates based on review while generating new IOG
0.5	11AUG2026	Updates from internal review
1.0	14AUG2026	Updates from final review. Initial document release.

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1 Overview

Version 2.00 firmware brings significant changes to networking using the 2500P-JACP. These changes were necessary to prepare the product for future inclusion of PROFINET as it requires a dedicated isolated port for the network communications.

This document outlines how V2.00 networking works and is a guide for changes that may be required for your JACP Workbench application when upgrading to V2.00 firmware.

The JACP is designed to operate as a co-processor in conjunction with the SIMATIC® 505 Series or CTI 2500 Series CPU acting as Host PLC to manage and control a process. The JACP enhances the Host PLC by providing drivers for multiple Ethernet protocols and serial protocols for communicating with external devices. Two methods are available for high-speed data transfer to/from the Host PLC: Data Cache and Block Transfer.

The JACP can be used in the following configurations:

- As a co-processor and share data with a Simatic/TI 545/555 or CTI 2500 PLC using the Block Transfer driver over the local backplane
- As a co-processor and share data with a CTI 2500 PLC using the Data Cache protocol over Ethernet
- As a co-processor and share data with a CTI Janus PLC using the binding protocol
- As a standalone controller with no need to share data with any other PLC

The JACP may be installed in a local or remote base. When installed in a remote base, the performance of the Block Transfer driver is degraded. When installed in a remote base with a Profibus RBC, the Block Transfer driver will not work, since the Profibus RBC does not support SFIO.

1.1 New Network Design Overview

Beginning with Firmware V2.00, a new network design is implemented in conjunction with the introduction of an updated operating system and a new internal network switch driver. Below is a summary of features with the new network design.

- The internal Ethernet switch now has the capability to “group” the 2 physical ports together into logical “Port Groups” and forward packets between them or completely isolate them from each other. This capability existed in previous firmware versions, but now the user has more explicit configuration control over the interface. There are 2 Port Groups available: Port Group 1 and Port Group 2.
- When the physical ports are grouped together and not isolated, they share a MAC address. When they are isolated, each port gets its own MAC address.
- Setup of the Port Groups is made by selecting the Internal Ethernet Switch Configuration on the **Network Settings** web page. There are 2 pre-configured Switch settings: NONE (no isolation) and ALL (ports isolated)
- Up to 2 IP Addresses can be defined, and the Network Settings web page Internal Ethernet Switch Configuration determines which IP Address(es) are available on each physical port.
- New settings on the module Network Settings Web page allow selection of **Fieldbus Port Group Assignments**. This setting controls which Port Group is used for Data Cache, Ethernet/IP (Scanner, Adapter, Flex IO, Tag Client), and PROFINET (future)
- Ethernet/IP Tag Server, CAMP Server, Modbus Server, and Workbench connections will work over any configured IP Address or physical port.

1.1.1 Operational Notes for V2.00 Networking

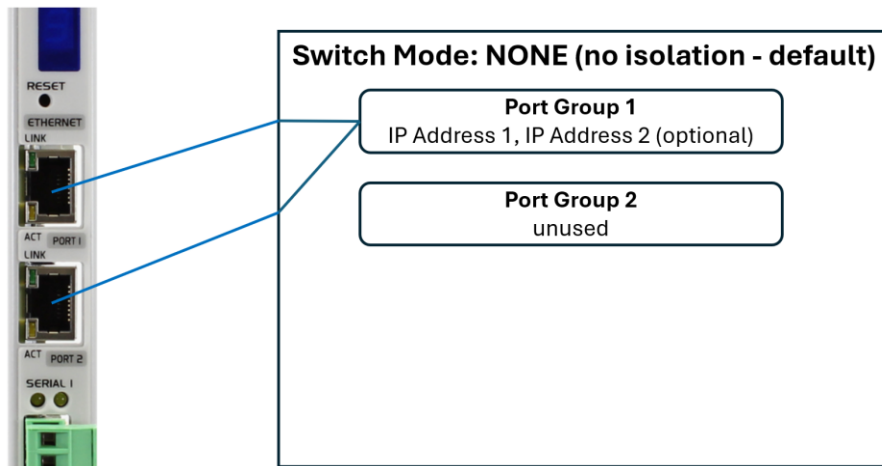
- A total of 2 IP addresses can be configured on the JACP. Each address must be on a unique and separate subnet, and the subnets cannot overlap. This requirement is unchanged from previous JACP firmware versions. For example, if the first IP address is 172.18.69.10/20 (255.255.240.0) then that network consists of all the addresses 172.18.64.1 - 172.18.79.254 inclusive. So, for this example you could not configure a second IP address as 172.18.75.10/24 (255.255.255.0) since that second network includes the addresses 172.18.75.1 - 172.18.75.254. This configuration would give you an overlap between the 2 subnets. The web page will check configured IP addresses for validity when you click the “Apply” button and will notify if any errors are present.
- Be aware that in future firmware releases that include PROFINET, the PROFINET Device or Controller address will count as the second of the 2 allowed IP addresses above.
- Only IP Address 1 is allowed to be configured as DHCP. IP Address 2, if used, must be configured as Static. DHCP is rarely, if ever, used since the address can change each time the product restarts. It is useful for initial startup “out of the box” only.
- IP Address 1 and IP Address 2 are automatically assigned to Port Groups. This setting is not user-configurable. IP Address 1 is always assigned to Port Group 1. IP Address 2 is

assigned to Port Group 1 when Switch Mode is NONE. IP Address 2 is assigned to Port Group 2 when Switch Mode is ALL.

- The network settings web page also allows selecting which Port Group is used for Ethernet/IP and DataCache.
 - For both Ethernet/IP and Data Cache, the choices are Disabled, Port Group 1, Port Group 2. The default (after firmware upgrade to V2.00) is “Disabled”. IMPORTANT NOTE: since this setting comes up as “Disabled” after firmware upgrade to V2.00, you will need to edit the Port Group configuration on the Network Settings web page if your application uses Ethernet/IP or Data Cache.
- Other protocols such as CAMP, Modbus, MQTT, Binding, and Workbench connections are automatically handled using the appropriate IP address and Port Group.
 - For example, if the JACP IP Address 1 of 192.168.1.10/24 and IP Address 2 of 192.168.2.10/24, then either address can be used for these protocols (ie CAMP Client or Server could communicate on either network). This is true whether the Ethernet Switch is in NONE or ALL.
- Ethernet/IP Tag Server, CAMP Server, Modbus Server, and Workbench connections will work over any configured IP Address or physical port
- Other notes:
 - Ethernet/IP and OPC get their IP Address assignment in the corresponding Fieldbus I/O configuration in Workbench.
 - Since a gateway is used when sending packets outside of your network, if you wish to isolate a port, then you are likely most interested in NOT configuring a gateway address because you do NOT wish any packets to be forwarded to another network.

1.1.2 Internal Ethernet Switch Configuration: **NONE**

The diagram below shows the port operation when Internal Ethernet Switch Configuration is NONE.

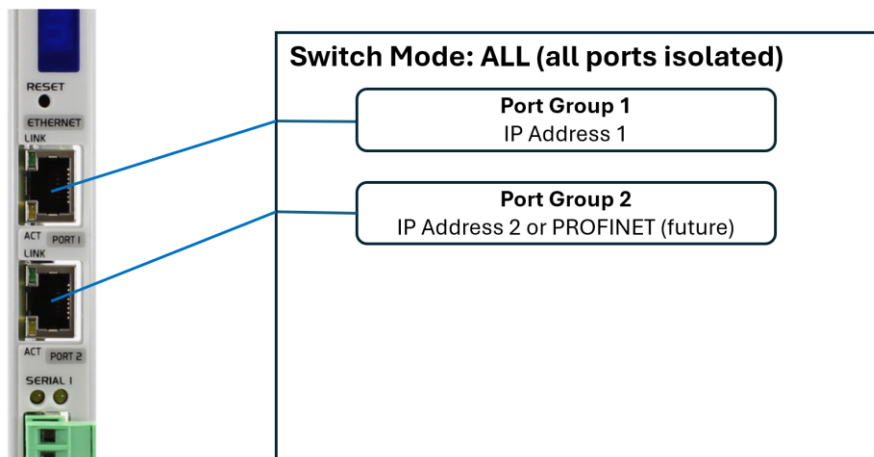


- Emulates the way the JACP worked previously in most applications
- Ports 1 and 2 on the front panel share a MAC address
- IP Address 1 and (optional) IP Address 2 are available on both physical ports. These two IP Addresses must be on different subnets.
- Packets are forwarded between Ports 1 and 2
- Example Use Case 1 (most common):
 - Only one IP Address is configured.
 - Port 1 is plugged into your factory network.
 - Port 2 is not used.
 - IP Address 1 is used by all protocols: Workbench, CAMP, OPC-UA, Modbus, MQTT, Ethernet/IP, Binding, Data Cache.
- Example Use Case 2:
 - Only one IP Address is configured.
 - Port 1 is plugged into your factory network.
 - Port 2 is cabled directly to your 2500-Cxxx Host PLC.
 - IP Address 1 is used by all protocols: Workbench, CAMP, OPC-UA, Modbus, MQTT, Ethernet/IP, Binding, Data Cache.
 - Packets are forwarded between Ports 1 and 2, allowing Data Cache communication and connection of 505 Workshop to your 2500-Cxxx Host PLC on Port 2.
- Example Use Case 3:
 - Two IP Addresses are configured.
 - Port 1 is plugged into your factory network.
 - Port 2 is not used.
 - IP Address 1 is used for Workbench, CAMP, Modbus, MQTT, Binding, Data Cache and these communications occur on Port 1

- IP Address 2 is used for Ethernet/IP and/or OPC-UA, and these communications occur on Port 1.
- Example Use Case 4:
 - Two IP Addresses are configured.
 - Port 1 is plugged into your factory network.
 - Port 2 is cabled directly to your 2500-Cxxx Host PLC.
 - IP Address 1 is used for Workbench, CAMP, Modbus, MQTT, Binding.
 - IP Address 2 is used for Ethernet/IP and/or OPC-UA, and these communications occur on Port 1.
 - Packets are forwarded between Ports 1 and 2, allowing Data Cache communication and connection of 505 Workshop to your 2500-Cxxx Host PLC on Port 2.
 - Data Cache communications can use IP Address 1 or IP Address 2.
- **IMPORTANT:** When the switch mode is NONE, to prevent creating a network “storm”, you **must not** plug cables into both ports unless
 - The cables go to 2 physically separate networks OR
 - You are “daisy chaining” to another device which is not connected to a network (as in Use Case 2 or 4 above).

1.1.3 Internal Ethernet Switch Configuration ALL

The diagram below shows the port operation when Internal Ethernet Switch Configuration is ALL.



- Provides full isolation between Ports 1 and 2
- Ports 1 and 2 each get a MAC address
- IP Address 1 is available only on Port 1 and must be on a different subnet than IP Address 2
- IP Address 2 is available only on Port 2 and must be on a different subnet than IP Address 1
- No packets are forwarded between Ports 1 and 2
- Example Use Case 1:
 - Two IP Addresses are configured.
 - Port 1 is plugged into your factory network. IP Address 1 is used for Workbench, CAMP, Modbus, MQTT, Binding.
 - Port 2 is plugged into your factory network OR a physically separate network. IP Address 2 is used for Ethernet/IP and/or OPC-UA.
 - Data Cache communications, if used, can be configured to occur on Port Group 1 (Port 1) or Port Group 2 (Port 2). If configured for Port Group 2, your 2500-Cxxx PLC must have an IP Address on the same network as IP Address 2.
- In this configuration, you must plug cables into both Ports 1 and 2. These cables can go to separate networks or to the same physical network.

1.2 Existing Use Cases in 2500P-JACP Networking

This section summarizes existing use cases for networking on 2500P-JACP (prior to V2.00 firmware) and shows how to support these use cases with V2.00 networking.

1. Single cable in Port 1. Switch set in “All Ports Isolated [Default]”. One IP address assigned. **See diagram in Section 1.3.2.** For example:
 - a. Primary subnet 192.168.1.10/24 used for Workbench, CAMP, OPC-UA, Modbus, MQTT, Ethernet/IP, Data Cache and Binding.

After firmware update, this use case is handled with the default Switch Mode NONE (and will also work with Switch Mode ALL). IP Address 1 is defined the same as the “Primary Subnet” from before. Ethernet/IP and Data Cache, if used, must be set to “Port Group 1”. The Ethernet/IP and OPC IP addresses must be set in Workbench to IP Address 1.

2. Single cable in Port 1. Switch set in “All Ports Isolated [Default]”. Two IP addresses assigned (required to be different subnets), but running on the same network infrastructure, so running out of Port 1. **See diagram in Section 1.3.2.** For example:
 - a. Primary subnet 192.168.1.10/24 used for Workbench, CAMP, Modbus, MQTT, Data Cache and Binding.
 - b. Alternate Subnet 1 – 192.168.2.10/24 used for Ethernet/IP and/or OPC-UA. In this case, the user wants the Ethernet/IP and OPC-UA on a different logical network from other traffic, but still running on the same physical network.

After firmware update, this use case is handled with the default Switch Mode NONE. IP Address 1 is defined the same as the “Primary Subnet” from before. IP Address 2 is defined the same as “Alternate Subnet 1” from before. EIP and DataCache must be set to “Port Group 1”. The Ethernet/IP and OPC-UA addresses must be set in Workbench to the desired values – IP Address 1 or IP Address 2.

3. Network 1 cable in port 1. Network 2 cable in port 2. Networks are “galvanically isolated”, ie separate infrastructure. Switch set in “All Ports Isolated [Default]”. Two IP addresses assigned (required to be different subnets). **See diagram in Section 1.3.4.** For example:
 - a. Primary subnet 192.168.1.10/24 used for Workbench, CAMP, Modbus, MQTT, Data Cache and Binding.
 - b. Alternate Subnet 1 – 192.168.2.10/24 used for Ethernet/IP and/or OPC-UA.

After firmware update, this use case is handled with Switch Mode ALL. IP Address 1 is defined the same as the “Primary Subnet” from before. IP Address 2 is defined the same as “Alternate Subnet 1” from before. Ethernet/IP must be set to Port Group 2. Data Cache must be set to the desired Port Group 1 or 2 based on the IP address of the Data Cache target. The Ethernet/IP and OPC-UA IP addresses must be set in Workbench to the desired values – IP Address 1 or IP Address 2.

4. Same as in #3 above, except switch set to “Forwarding between 1 & 2”. Another cable in port 2 is connected to a downstream CTI 2500-Cxxx PLC. **See diagram in Section 1.3.3.**

After firmware update, this use case is handled with the default Switch Mode NONE. IP Address 1 defined the same as the “Primary Subnet” from before. IP Address 2, if it exists, is defined the same as “Alternate Subnet 1” from before. Ethernet/IP and Data Cache must be set to “Port Group 1”. The Ethernet/IP and OPC-UA IP addresses must be set in Workbench to the desired values – IP Address 1 or IP Address 2. The downstream cable to the 2500-Cxxx must be inserted

directly into Port 2. NOTE: this Port 2 cannot go to a switch on the same physical network as Port 1.

1.3 Networking V2.00 Setup Guide

Networking configuration is done using the **Network Settings** web page in the module and by using Workbench Fieldbus Configuration for some protocols like Ethernet/IP, as outlined in the 4 steps below. Some of these steps are done automatically during the firmware upgrade process.

1. Configuring “Our IP Address” in Workbench if certain Ethernet/IP protocols are used
2. Configuring IP Address(es) – done automatically by the firmware upgrade process
3. Configuring the Internal Ethernet Switch Mode – NONE or ALL – automatically set to NONE by the firmware upgrade process
4. Configuring Port Groups for Ethernet/IP and Data Cache – **must be done manually.**

IMPORTANT NOTE: After you upgrade from a previous firmware version to V2.00, the following settings are made automatically:

- Your previous “Primary Subnet” address becomes IP Address 1
- Your previous “Alternate Subnet 1” address (if used) becomes IP Address 2
- Internal Ethernet Switch Configuration is set to NONE
- Ethernet/IP and Data Cache Port Groups are set to “Disabled”

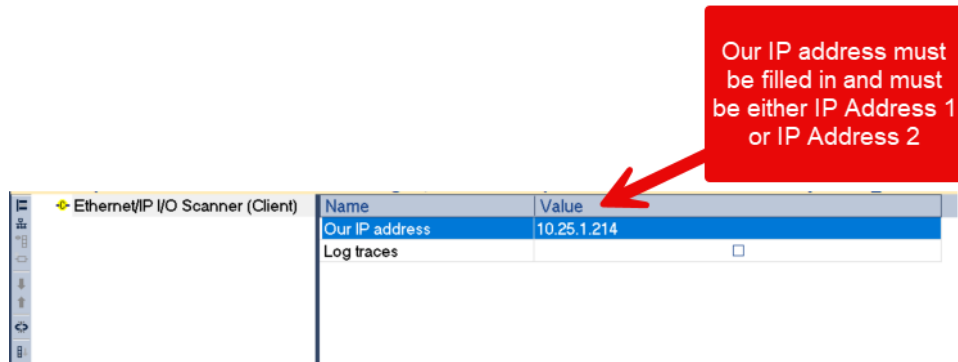
Networking setup after upgrade to V2.00 firmware depends on:

- a. How many network cables are used in the existing installation: 1 cable or 2 cables?
- b. Does Cable 2 (if used) connect to a downstream 2500-Cxxx (or Ethernet/IP device) or to a physically separate network?
- c. How was the Ethernet Switch set previously: “All Ports Isolated” or “Forwarding between 1 & 2”?

Detailed setup instructions for each of these cases is included in the sections below.

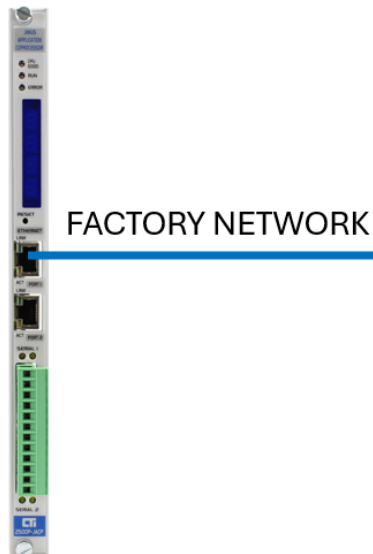
1.3.1 All Installations

For all JACP installations which use the protocols Ethernet/IP Adapter, Ethernet/IP FlexIO, Ethernet/IP I/O Scanner, or Ethernet/IP Tag Client, you MUST ensure that the “Our IP Address” set in the Workbench Fieldbus Configuration contains a valid IP address which must be either IP Address 1 or IP Address 2 (if configured). Example:



Previous versions of JACP firmware would default to the Primary Subnet address if this field was left blank, but now this field MUST have a valid IP address - IP Address 1 or IP Address 2, depending on which address you plan to use for Ethernet/IP communications. This is necessary so the firmware can configure these protocols to use the desired port.

1.3.2 Installation with 1 cable connected to JACP



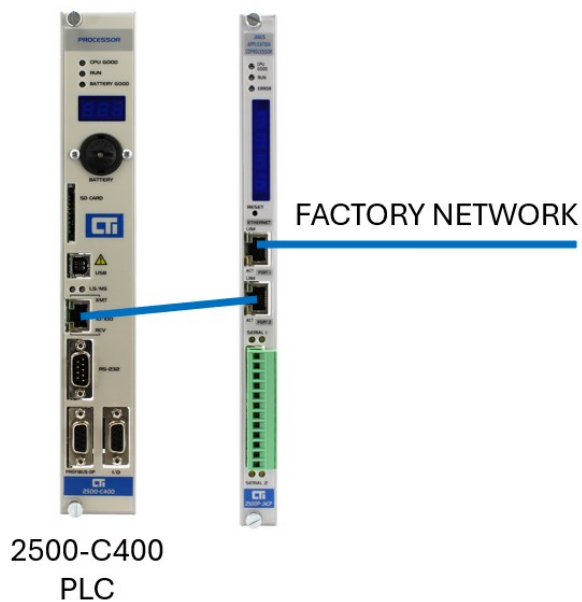
1.3.2.1 Ethernet Switch was previously set to “All Ports Isolated”

- a. Ensure the network cable is plugged into Port 1
- b. On the Network Settings web page, set the **Internal Ethernet Switch Configuration** to **NONE**. This should have been automatically done by the firmware upgrade process.
- c. In the Network Settings web page, set “IP Address 1 Configuration” to the “Primary Subnet” address. Set “IP Address 2 Configuration” to the “Alternate Subnet 1” address. This should have been automatically done by the firmware upgrade process.
- d. In the Network Settings web page, set **Fieldbus Port Group Assignments** for Ethernet/IP and Data Cache (if these protocols are used) to Port Group 1. This step must be done manually, as it is not performed automatically by the firmware upgrade process.

1.3.2.2 Ethernet Switch was previously set to Forwarding between 1 & 2

This would not be a valid configuration since the installation has only 1 cable.

1.3.3 Installation with 2 cables connected to JACP, where Port 2 connects to a single downstream device (2500-Cxxx PLC or Ethernet/IP device)



1.3.3.1 Ethernet Switch was previously set to “All Ports Isolated”

This configuration would not be very useful since the JACP port isolation would prevent connecting to this PLC or Ethernet/IP device from the Factory Network with Workshop, SCADA, or Ethernet/IP device management software. Consequently, this is not a recommended configuration. However, the JACP could still communicate over Port 2 with the 2500-Cxxx PLC using Data Cache or with the Ethernet/IP device.

- Set Internal Ethernet Switch Configuration to ALL.** NOTE: the firmware upgrade process sets this to NONE, so this setting will need to be manually changed in the Network Settings webpage.
- In the Network Settings web page, set “IP Address 1 Configuration” to the “Primary Subnet” address. Set “IP Address 2 Configuration” to the “Alternate Subnet 1” address. This should have been automatically done by the firmware upgrade process.
- In the Network Settings web page, set **Fieldbus Port Group Assignment** for Ethernet/IP (if used) to Port Group 2 OR, if Port 2 connects to a 2500-Cxxx PLC, set the **Fieldbus Port Group Assignment** for Data Cache to Port Group 2. This step must be done manually, as it is not performed automatically by the firmware upgrade process.

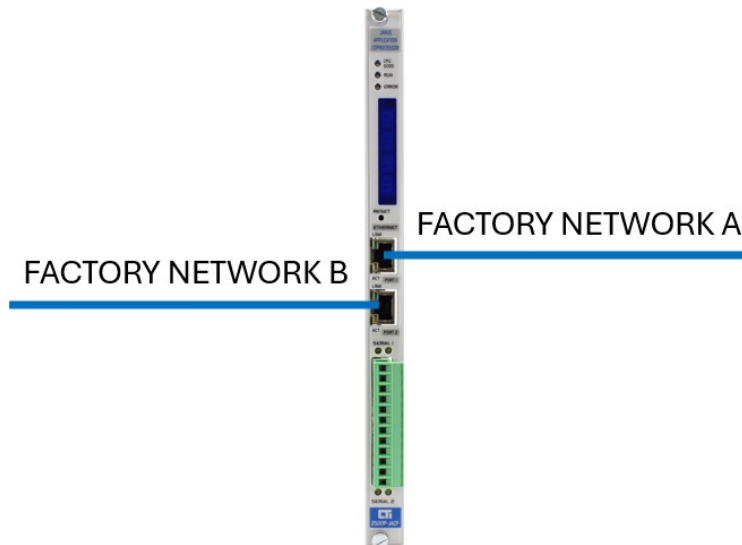
1.3.3.1 Ethernet Switch was previously set to Forwarding between 1 & 2

This configuration would be useful with since the JACP port forwarding allows connecting a PLC (as shown in the diagram above) or Ethernet/IP device from the Factory Network with Workshop, SCADA, or Ethernet/IP device management software.

- Set **Internal Ethernet Switch Configuration** to **NONE**. This should have been automatically done by the firmware upgrade process.

- b. In the Network Settings web page, set “IP Address 1 Configuration” to the “Primary Subnet” address. Set “IP Address 2 Configuration” to the “Alternate Subnet 1” address. This should have been automatically done by the firmware upgrade process.
- c. In the Network Settings web page, set **Fieldbus Port Group Assignment** for Ethernet/IP and/or Data Cache (if used) to Port Group 1. This step must be done manually, as it is not performed automatically by the firmware upgrade process.

1.3.4 Installation with 2 cables connected to JACP, where Port 2 connects to physically separate network with Ethernet/IP devices and/or SCADA communicating with OPC-UA



1.3.4.1 Ethernet Switch was previously set to “All Ports Isolated”

This would be the typical configuration where the 2 networks need to remain isolated from each other.

- Set **Internal Ethernet Switch Configuration** to **ALL**. This should have been automatically done by the firmware upgrade process.
- In the Network Settings web page, set “IP Address 1 Configuration” to the “Primary Subnet” address. Set “IP Address 2 Configuration” to the “Alternate Subnet 1” address. This should have been automatically done by the firmware upgrade process.
- In the Network Settings web page, set **Fieldbus Port Group Assignment** for Ethernet/IP to Port Group 1 or Port Group 2, depending on which network the Ethernet/IP devices reside on. This step must be done manually, as it is not performed automatically by the firmware upgrade process.
- In the Network Settings web page, set **Fieldbus Port Group Assignment** for Data Cache to Port Group 1 or Port Group 2, depending on which network the Data Cache host resides on. This step must be done manually, as it is not performed automatically by the firmware upgrade process.

1.3.4.2 Ethernet Switch was previously set to Forwarding between 1 & 2

This configuration would be very unusual since the JACP forwards packets between the 2 networks – thereby defeating the purpose of using 2 physically separate networks. This is not a recommended configuration.

- Set **Internal Ethernet Switch Configuration** to **NONE**. This should have been automatically done by the firmware upgrade process.

- b. In the Network Settings web page, set “IP Address 1 Configuration” to the “Primary Subnet” address. Set “IP Address 2 Configuration” to the “Alternate Subnet 1” address. This should have been automatically done by the firmware upgrade process.
- c. In the Network Settings web page, set **Fieldbus Port Group Assignment** for Ethernet/IP and/or Data Cache (if used) to Port Group 2. This step must be done manually, as it is not performed automatically by the firmware upgrade process.

1.4 New IP Address Display

See Section 1.4.1 below for description of CIDR notation.

- When Switch Mode = NONE (no ports isolated)
 - IP - xxx.xxx.xxx.xxx – CIDR (for IP Address 1)
 - IP - xxx.xxx.xxx.xxx – CIDR (for IP Address 2)
 - NOTE: the user can set whether a particular address is displayed on the [Network Settings](#) web page.
- When Switch Mode = ALL (all ports isolated)
 - P1 - xxx.xxx.xxx.xxx - CIDR
 - P2 - xxx.xxx.xxx.xxx – CIDR
 - NOTE: the user can set whether a particular address is displayed on the [Network Settings](#) web page.

NOTES:

- The user can tell the switch mode, All or None, by looking at how the IP addresses are displayed on the front panel. If switch mode = NONE, the IP address is preceded by “IP”. If switch mode = ALL, the IP address is preceded by “P1” or “P2”, where the number indicates the port number used by the associated IP address.
- When NO IP Addresses are selected for display, the module will display “NoIPDISP”

1.4.1 CIDR Notation

CIDR notation (Classless Inter-Domain Routing) is an alternate method of representing a subnet mask. It is simply a count of the number of network bits (bits that are set to 1) in the subnet mask. It provides a more concise way to represent the subnet mask. The CIDR number is typically preceded by a slash "/" and follows the IP address. For example, an IP address of 131.10.55.70 with a subnet mask of 255.0.0.0 (which has 8 network bits) would be represented as 131.10.55.70 /8. The following table can be used to convert between subnet mask and CIDR.

CIDR	Dotted Decimal		CIDR	Dotted Decimal
/1	128.0.0.0		/17	255.255.128.0
/2	192.0.0.0		/18	255.255.192.0
/3	224.0.0.0		/19	255.255.224.0
/4	240.0.0.0		/20	255.255.240.0
/5	248.0.0.0		/21	255.255.248.0
/6	252.0.0.0		/22	255.255.252.0
/7	254.0.0.0		/23	255.255.254.0
/8	255.0.0.0		/24	255.255.255.0
/9	255.128.0.0		/25	255.255.255.128
/10	255.192.0.0		/26	255.255.255.192
/11	255.224.0.0		/27	255.255.255.224
/12	255.240.0.0		/28	255.255.255.240
/13	255.248.0.0		/29	255.255.255.248
/14	255.252.0.0		/30	255.255.255.252
/15	255.254.0.0		/31	255.255.255.254
/16	255.255.0.0		/32	255.255.255.255

1.5 Configuration Flowcharts

