CTI JANUS CONTROLLER APPLICATION COPROCESSOR QUICK START GUIDE
VERSION 1.0   2022.08.30

Purpose of this Document

This document is designed to assist you in unpacking and initial installation of the CTI Janus Application Coprocessor (JACP) module. It also describes options for setting the network parameters required for basic operation.

For assistance with configuration and operation, we recommend that you download the *JACP Installation and Operation Guide* from the CTI web site: www.controltechnology.com/support/manuals/.

Introduction

The CTI Janus Application Coprocessor (JACP) module augments the communications capability of CTI Janus Controllers and CTI 2500 Series controllers. It also enables Siemens Series 505© controllers to communicate using modern Ethernet protocols, such as Ethernet/IP and OPCUA. In some applications, it can function as a standalone controller, using Ethernet IO protocols, such as Ethernet/IP scanner and Modbus Client drivers.

Unpacking the Module

Open the shipping carton and remove the special anti-static bag that contains the module. After discharging any static build-up, remove the module from the static bag. Do not discard the static bag. Always use this bag for protection against static damage when the module is not inserted into the I/O base.

> *CAUTION:*
> *The components on the JACP Module can be damaged by static electricity discharge.*
> *To prevent this damage, the module is shipped in a special anti-static bag. Static control precautions should be followed when removing the module from the bag and when handling the printed circuit board during configuration*

Installation

The Janus Controller is shipped with the internal System SD card installed. The firmware is pre-loaded on the System SD card and ready for operation.

The JACP Module can be installed into any available slot in the base that accepts single wide I/O modules.

To install, remove power from the chassis, align the circuit board with the connector, and slide the controller into the rack until the connector seats. Use the thumbscrews to secure the controller to the rack.

Apply power to the base power supply. The POWER GOOD LED on the power supply should illuminate, indicating that power is being supplied to the base connectors.

Startup

The JACP module takes about 12-15 seconds to complete the startup sequence. During startup, you should see a scrolling decimal point in the front panel alphanumeric display.

The JACP module automatically assigns a unique Link Local compatible IP Address and Subnet mask during the startup process. Additional network parameters can be obtained from a DHCP server if available.

When startup is complete, the firmware version is briefly displayed and the active network parameters (IP Address and Subnet mask in CIDR format) are scrolled across the front panel display.

See 'Setup' section below for a description for setting a static IP Address and Subnet mask.

Module Status Indicators

When this is complete, the status indicators should be in the state as shown in the table below:

Indicator	State	Comments
CPU GOOD	ON	If the CPU GOOD LED is OFF, contact CTI Technical Support.
RUN	OFF	This LED is set ON when the application program is running in the CPU. It will always be OFF on initial startup.
ERROR	OFF	This LED should normally be OFF. should have a network address (either by DCHP server or internally generated Link-Local compatible parameters). If this LED is blinking and the display shows an error, contact CTI Technical Support.

Module Configuration Switch Locations
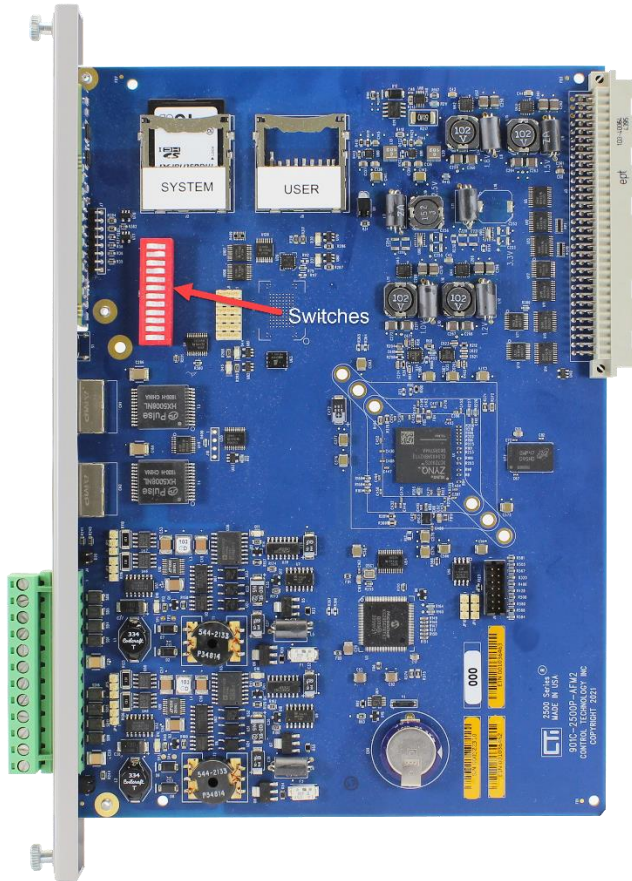
Setting Static Network Parameters

The JACP Module will operate with network settings obtained from a DHCP server or internally generated Link-Local compatible parameters. However, it is not guaranteed that the same IP Address will always be available following a power cycle. *CTI highly recommends that static network parameters be assigned before using the JACP Module in a control application.*

The JACP module offers three different methods for assigning static network parameters: IP Address, Subnet Mask, and Gateway Address for initial setup or following a configuration reset. You can use any of the methods described below:

1) **Connect to JACP via DHCP-assigned parameters**

   By default, the JACP Module will automatically obtain network settings from a Dynamic Host Configuration Protocol (DHCP) server if available. This allows easy access to the controller web server for setting a fixed IP Address and configuration parameters.

   If a DHCP server is available, the network parameters obtained via DHCP are scrolled on the front panel display. Your PC should also be able to obtain an IP Address on the same subnet from the DHCP server, and you are ready to connect to the JACP Module.

   You must connect an Ethernet cable from your PC directly or via network switch to any of the JACP Module front panel Ethernet ports (**PORT 1** or **PORT 2**).

Make a TCP connection to the JACP Module web server by entering the DHCP-assigned IP Address displayed on the JACP Module front panel into your browser address bar and select 'Configuration / Network Settings' from the web server menu.

Enter the static network parameters into the 'Primary Subnet Configuration' table. Press 'Apply' button at the bottom of the page to assign new parameters and reset the CPU.

2) **Connect to JACP Module via Link-Local compatible settings**

If a DHCP server is not available, the Link Local compatible settings generated by the Janus CPU are displayed on the front panel. Link-Local settings are displayed only when no other network settings have been configured and can be identified as an 'Auto-IP' by letter 'A' preceding the IP Address on the display.

The Link-Local parameters are assigned as shown below:
> IP Address in IPV4 Link-Local range: 169.254.0.0 – 169.254.255.255
> Subnet Mask: 255.255.0.0 (CIDR 16)
> Gateway Address: 0.0.0.0

In this case, you must manually assign an IP Address for your PC Network 'Local Area Connection' TCP/IPv4 that is in the Link-Local range shown above and set Subnet Mask = 255.255.0.0.

Connect an Ethernet cable from your PC directly or via network switch to any of the JACP Module front panel ports (**PORT 1** or **PORT 2**).

Make a TCP connection to the JACP Module web server by entering the Auto-IP Address displayed on the JACP Module front panel and select 'Configuration / Network Settings' from the web server menu.

Enter the static network parameters into the 'Primary Subnet Configuration' table. Press 'Apply' button at the bottom of the page to assign new parameters and reset the CPU.

3) **Use the *SD Card Ethernet Port Setup* method**

The **SD Card Ethernet Port Setup** provides an alternate method to specify static network settings for the controller without requiring an Ethernet connection between your PC and JACP Module.

This operation requires the following steps:

a) Create a file named 'cti.ini' using your favorite text editor (Windows® Notepad works just fine). The following keywords and associated values must be inserted into this file.
The values must be valid network settings expressed in dotted decimal notation.

Each keyword/value combination must be entered on a separate line. If keywords are duplicated, only the first entry is processed – the others are ignored.

> [NET0]
> usingdhcp = false
> ip = x.x.x.x
> subnetmask = x.x.x.0
> gateway = x.x.x.x *

* The 'gateway' keyword and associated value is optional. If you don't want to specify a default gateway address, you must omit the entire line containing the keyword "gateway".

Examples:

With Gateway Address:	Without Gateway Address:
[NET0]	[NET0]
usingdhcp = false	usingdhcp = false
ip = 198.18.74.56	ip = 198.18.74.56
subnetmask = 255.255.255.0	subnetmask = 255.255.255.0
gateway = 198.18.74.1	

b) Copy the cti.ini file created above to the root directory of a SD card. The file system of the user SD card should be either FAT32 or EXFAT. This is the way they come when newly purchased. If you have reformatted your SD card with the NTFS file system or any other file system, it will not work.

c) Turn off power to the base, remove the module from the base, set Module Switch 4 to CLOSED position (and ensure Module Switch 2 is OPEN) and insert that card into the User SD Card receptacle on the JACP PC board.   Re-install the module into the base, and restore power.

d) On power up, the controller enters **Port Parameter Setup** mode and displays **PPSt** on the front panel display. While in this mode, the web server can be accessed using the currently active IP address. However, the controller will not accept connections from *Janus Workbench* until the CPU starts up in normal operating mode (with Module Switch 4 set OPEN).

e) Next, the controller will attempt to find the 'cti.ini' configuration file in the root directory of the front panel SD card. If cti.ini file is found, the file is then validated to ensure all the required data is included and correct. If the required keywords are found and validated, the procedure continues at step (g) below.

f) If any of the following errors occur, **PPEr** is displayed for 5 seconds indicating a **Port Parameterization Error** and the appropriate error (see below) is generated.

- If a properly formatted SD card is not inserted into the front panel receptacle:
  Error 370 (**User SD Card Not Accessible**) is reported.

- If the cti.ini file cannot be found in the SD card root folder:
  Error 250 (**User SD Card – Update File Not Found**) is reported.

- If the cti.ini file does not contain the required keywords/values:
  Error 260 (**(User SD Card - Invalid Update File)** is reported.

g) If an error is encountered, the procedure will stop. After correcting the problem, you must re-power the module.

h) If the operation successfully completes, the parameterization data is saved in the JACP Module for the next controller startup and **PPdn** indicating **Port Parameterization Done** is displayed on the front panel.

Note: The cti.ini file on the user D card is renamed cti.bak to prevent the same network settings from accidentally being used to configure another JACP Module.

i) To return to normal operation, turn off power to the base, remove the module from the base, set Module Switch 4 to the Open position, remove the SD card from the User SD receptacle (optional), re-install the module into the base, and restore power.

j) On power up, the firmware performs subnet validation on the saved values. If they pass, those values are written into system parameter data. A 'Changed Network Settings' event is generated in the Event Log.

See Chapter 4 in the *JACP Module Installation and Operation Guide* for details on JACP Module configuration options.

Development Software

Janus Workbench Software (Order# 2500P-WB-USB) is required for application development and configuration of communications for the JACP Module. Contact CTI for more information. Contact information is listed at the bottom of this document.

Firmware Update

Prior to using the Janus Controller, you should verify that the controller firmware is current. The firmware version number displayed in the Product Information page of the embedded web server.

The current firmware version is available on the CTI web site at the following link: http://www.controltechnology.com/support/software-revision/ .

See Chapter 6 in the *Janus Controller Installation and Operation Guide* for information on updating firmware.

Technical Assistance

If you need assistance from CTI, please email CTI Technical Support at support@controltechnology.com or contact call us at 865-584-0440 or 800-537-8398 (USA only).