2500 Series® PAC System
Product Bulletin

CTI 2500 Series®
2500C-J750 "Janus"
Compact Programmable Automation Controller

Compact



DESCRIPTION

The new Compact "Janus" Processor brings completely new capabilities to the CTI 2500 Series® System. Designed to work seamlessly with existing 2500 Series® (Classic and Compact) and Simatic® TI505 Systems as well as look to the future with state-of-the-art programming, protocols and capabilities, including support for Industry 4.0 through direct access to the Industrial Internet of Things (IIOT) using MQTT.

This Programmable Automation Controller (PAC) is fast, agile and optimized for quick, easy, and cost-effective communications. It features integrated drivers to an industry-leading number of protocols, allowing communications with best-in-class I/O devices, drives, and HMI/SCADA no matter the manufacturer. Programmed with CTI's user-friendly and budget-friendly new JANUS Workbench Software, which supports all IEC-61131-3 programming languages.

KEY FEATURES

- Programmed using Janus Workbench Software (JSoft), which allows use of all IEC-61131-3 languages: LD (RLL), FBD, ST, SFC and IL
- Up to 10x execution speed compared to current 2500 Series® CPUs
- Built-in Remote I/O and Profibus interfaces with support for all existing 2500 Series® discrete and analog modules, Classic and Compact. NOTE: Special Function modules are not currently supported, However, due to the enhanced communication capabilities of the Janus controller, Ethernet-based special function modules are no longer necessary.
- Built-in web server for diagnostics and statistics simplifies troubleshooting and support
- Built-in web-based visualization of graphics pages designed in Janus Workbench
- Entire operating system, firmware, and user program is contained on a standard SD card, which makes replacement of the PLC easy, should you ever have a failure
- Four Ethernet ports with internal switch that supports simultaneous connection to 4 different Ethernet networks
- Support of multiple communication protocols for connecting to major HMI and SCADA systems
- Extensive built-in communications capabilities:
  - ✓ Optimized peer-to-peer communications with other JANUS Series PACs and 2500P-ACP1 / 2500P-JACP/ 2500P-ECC1 coprocessors
  - ✓ CAMP Client for communicating with all CTI Ethernet products (2572, 505-CP2572, 2572-A, 2572-B, 2500P-ECC1, 2500 Series® CPUs)
  - ✓ CAMP Server for HMI/SCADA access
  - ✓ Open Modbus Client and Server
  - ✓ Ethernet/IP Scanner
  - ✓ Ethernet/IP Adapter
  - ✓ Ethernet/IP Tag Client
  - ✓ Ethernet/IP Tag Server
  - ✓ MQTT client for direct access to the IIoT
  - ✓ OPC-UA server (firmware 1.24 and above)
  - ✓ Profinet controller and device (future)

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IMPORTANT NOTE ON MAXIMUM ETHERNET CONNECTION LIMIT

The 2500C-J750 permits a maximum of 64 Ethernet connections. This is the TOTAL of all Client protocol connections that are configured, plus whatever external devices connect to Server protocols.

For example, suppose an application has:

5 Modbus clients configured

4 Modbus devices which connect to the Modbus Server

16 Ethernet/IP scanner devices configured

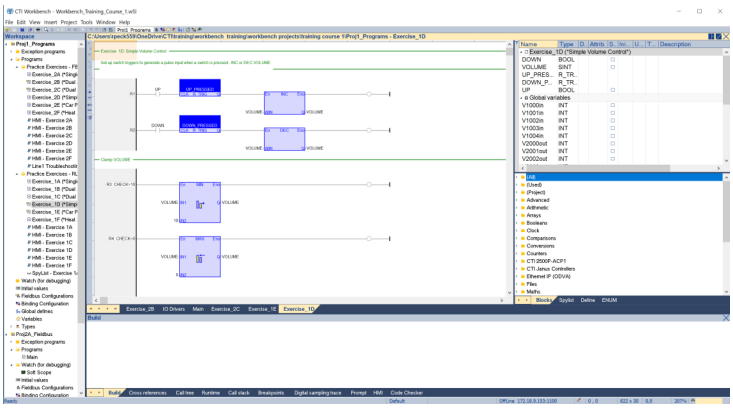
2 devices which connect to the Ethernet/IP Tag Server

8 CAMP Client connections configured

4 devices which connect to CAMP Server

4 devices which connect to OPC-UA Server

This application has used (5+4+16+2+8+4+4) or 43 out of the possible 64 connections.



HARDWARE FEATURES

- Front display for IP address and error messages
- Four Ethernet ports can be configured with up to four unique network addresses
- Internal SD card contains entire operating system, firmware, user program, configuration, user data (NOTE: This allows rapid replacement of a failed CPU simply by transferring the old SD card into the replacement unit)
- External SD card for file exchange, firmware update, initial IP address assignment
- Front-accessible battery

PROGRAMMING WITH JANUS WORKBENCH

- Programmed with Janus Workbench, a tag-based integrated development environment which allows use of SFC, FBD, RLL, ST, IL programs and allows configuration of all communications within the same software - simplifies engineering by configuring all PLC logic and communications in a single application
- Complete backup of all program source files to the PLC whenever a change is made - allows recovery of the complete application if source files are lost from the development PC
- Support for complex data structures
- Built-in simulator
- Built-in trending and charting
- Extensive import/export features allow use of Excel for managing variable library
- Ability to interface with version control software
- Enhanced on-line change features allow extensive editing without stopping the PLC
- Free video-based training on YouTube

HMI / SCADA CONNECTIVITY FEATURES

- CAMP Server - allows seamless migration of existing 2500 Series® PLC installations with no need to reconfigure HMI & SCADA devices
- Modbus-TCP Server, Ethernet/IP Tag Server - allows connection to most major HMI and SCADA systems
- OPC-UA connectivity coming soon
- Support for multiple networks allows SCADA traffic to be separated from other PLC and device communications
- Special variable binding protocol for use with COPA-DATA zenon SCADA software

SECURITY FEATURES

- "Secure Boot" process uses encryption keys to verify that the PLC is booting from the trusted CTI executable firmware
- Password protection for
  - ✓ connecting to the PLC with Workbench
  - ✓ view / edit of individual programs
  - ✓ modifying PLC settings via web server
  - ✓ file management and firmware update functions
  - ✓ access to web visualization
- Future security enhancements for encryption of communications

COMPATIBILITY FEATURES

- Support for local I/O, remote I/O and Profibus with configuration done in Workbench – allows Janus to operate in all 2500 Series® and Simatic/TI 505 applications
- Support of extensive communications capability on the Controller means that SF modules do not need to be supported
- Support of special CTI "DataCache" protocol allows direct communication with existing CTI 2500 Series® Processors with updates guaranteed every scan
- Existing HMI/SCADA devices can communicate with the PLC using CAMP. Variables can be named with valid "505" memory references or tagged with a 505 "pseudonym" like V100. When the HMI polls for V100, the CPU will return the value of the tag.
- Library of "505 style" function blocks like Drums – allows users proficient with 505 Workshop to use these same features in Workbench
- Conversion assistance for migrating Workshop, TISoft, and APT™ Programs to Workbench

SPECIFICATIONS

Status Display: 4-Digit LED display for system status, error reporting and IP address

Backplane Power: 7 Watts (maximum)

Operating Temperature: 0^{o} to 60^{o}C

Storage Temperature: -40^{o} to 85^{o}C

Relative Humidity: 5% to 95%

Agency Approvals Pending: CE, UL UL-C, Class 1 Div 2

Shipping Weight: 1.5 lb. (0.68 Kg)

Comparing 2500 Series® Ethernet Solutions

	2572	2572-A	2572-B	2500-Cxxx / 2500C-Cxxx	2500P-ECC1	2500P-ACP1	2500P-JACP	2500P-J750 / 2500C-J750	Siemens 505-CP1434-TF	Siemens 505-CP1434-TCP
Applications Supported										
Programs with				Workshop, TISoft, APT	ECC1 Configurator	Workbench (Jsoft)	Workbench (Jsoft)	Workbench (Jsoft)		
PLC programming	✓	✓	✓						✓	✓
HMI/SCADA access	✓	✓	✓	✓	✓		✓[11]	✓[11]	✓	✓
Peer-peer (CAMP)	✓	✓	✓	✓[6]	✓	✓	✓	✓		✓
Peer-peer (other)	✓[1]	✓[2]	✓[2]		✓[2,3]	✓[2,3]	✓[2,3]	✓[2,3]	✓	
Communication to SIMATIC/TI 505® CPU over the backplane	✓	✓	✓			✓	✓		✓	✓
Communication to Rockwell PLCs		✓[4]	✓[4]			✓[5]	✓[12]	✓[12]		
Communication to S7	✓									✓
Email	✓									✓
Communication to Modbus TCP devices		✓[9]	✓[9]		✓	✓	✓	✓		
Communication to Ethernet/IP devices		✓[4]	✓[4]			✓[5]	✓[12]	✓[12]		
Performance in CTI standard SCADA test										
Packets sent/received per second [10]	68	102	102	199	989	N/A	N/A	N/A	N/A	N/A
Protocols Supported										
505 Ethernet (aka CAMP, NITP)	✓	✓	✓	✓[7]	✓	✓[8]	✓	✓		✓
Multicast		✓	✓		✓	✓	✓	✓		
Data Cache with 2500-Cxxx PLCs					✓	✓	✓	✓		
Network Data Exchange					✓	✓	✓	✓		
Data Share	✓									
Modbus-TCP		✓[7]	✓[7]		✓	✓	✓	✓		
Ethernet/IP		✓[4]	✓[4]			✓[5]	✓[12]	✓[12]		
H1									✓	
Communicates Directly With (Over Ethernet)										
2572	✓	✓	✓	✓	✓	✓	✓	✓		✓
2572-A	✓	✓	✓	✓	✓	✓	✓	✓		✓
2572-B	✓	✓	✓	✓	✓	✓	✓	✓		✓
2500 Series® CPUs	✓	✓	✓		✓	✓	✓	✓		✓
2500P-ECC1	✓	✓	✓	✓	✓	✓	✓	✓		✓
2500P-ACP1	✓	✓	✓	✓	✓	✓	✓	✓		✓
2500P-JACP						✓	✓	✓		
2500P-J750 CPU						✓	✓	✓		
505-CP1434-TF									✓	
505-CP1434-TCP	✓	✓	✓	✓	✓	✓	✓	✓		✓
Other										
For Direct Use with SIMATIC TI505®	✓	✓	✓			✓	✓		✓	✓
Webserver for diagostics		✓	✓	✓	✓	✓	✓	✓		
OPC/DDE support	✓	✓	✓	✓	✓		✓	✓	✓	✓
100Mbit speed		✓	✓	✓	✓	✓	✓	✓		
1000Mbit speed							✓	✓		
Availability										
Manufactured and supported			✓	✓	✓	✓	✓	✓		
Support Only	✓	✓								

Notes V3.2

[1] Datashare protocol

[2] IP Multicast

[3] Network Data Exchange

[4] Supports accessing V memory using CIP DATA TABLE READ and CIP DATA TABLE WRITE messages

[5] Supports connections to Ethernet/IP devices via I/O Scanner, I/O Adapter, Explicit Message Adapter, and Tag Client interfaces

[6] CPU supports "server only" for peer-peer

[7] Supports "server" operation only

[8] Supports "client" operation only

[9] Supports "slave" operation only

[10] Tested with Kepware OPC Server, 3 connections from 2 different PCs, each connection polling 1000 C's and 1000 V's at 10msc speed, 30msec PLC scan

[11] Using OPC-UA or CAMP Server

[12] Supports connections to Ethernet/IP devices via I/O Scanner, I/O Adapter, Tag Client/Server, Explicit Message Client/Server, and Flex I/O Client

2500C-J750 "Janus" Controller Specifications	
Built-in display for IP address and errors	yes
Ethernet	
Number of IP/Subnet Configurations	4
Number of connections	64
I/O	
Max I/O Points (Digital / Analog)	16K / 16K
Local I/O	yes
Remote I/O	yes
Ethernet I/O	future
Profibus - 64 Slaves	yes
Max I/O Data (Bytes)	32K
User Memory	
Code (Programs + Fieldbus)	3MB
Data	64MB
Web Server	yes
Enhanced On-line change	yes
Communication Protocols	
Binding (peer-peer)	yes
CAMP Server	yes
Camp Client	yes
Modbus UDP/TCP Client	choose 2**
Modbus UDP/TCP Server	yes
Data Cache Client Connections / Variables	1 / 6144
DataCache Client Block Disable	yes
Ethernet/IP Scanner & Flex I/O	choose 2**
Ethernet/IP Adapter	yes
Ethernet/IP Tag Server	yes
Ethernet/IP Tag Client	choose 2**
MQTT Client (communicates with broker)	yes
OPC-UA Server	yes
Profinet Controller	future
Profinet Device	future
SFIO Block Transfer	no

** Project may include two of these protocols