

# 2500P-ACP1

## Application Coprocessor



### Description

The 2500P-ACP1 module is a general-purpose auxiliary controller that enhances the capabilities of all CTI 2500 Series® and SIMATIC® 505 PLC systems. This Advanced Function Module includes high-speed processing and multi-protocol communications support to provide existing systems with a significant increase in performance, features, and functionality.

The 2500P-ACP1 runs as a PLC coprocessor performing complex logic/math functions, data logging, and communications with external devices. Although the 2500P-ACP1 can operate as a stand-alone controller, the application generally requires data transfer between a host PLC and the module. Two different data transfer options are provided:

**PLC I/O:** The 2500P-ACP1 emulates a standard I/O module configured as 32WX / 32WY and/or 32X / 32Y image register data points. This allows the module to work with SIMATIC® 545/555 CPUs in limited applications where a maximum of 32 words of data is transferred to/from the CPU each PLC scan.

**Data Cache:** Proprietary link offering enhanced data throughput to CTI 2500 Series® controllers via a dedicated Ethernet connection. Supports up to 4096 variables mapped to any PLC memory type (including Loop/Alarm variables).

The 2500P-ACP1 includes two external 10/100Mb Ethernet ports with automatic detection of network speed, duplex mode, and cable wiring.

Both ports are connected to an internal Ethernet switch that provides enhanced filtering and protection against excessive network traffic known as broadcast “storms”. The internal switch is connected to a single Ethernet controller so that only one LAN IP Address is associated with the module. The firmware includes a full function TCP/IP stack that supports both TCP and UDP protocols.

A serial port (male DB-9) provides an electrical interface for RS-232-C (subset) and RS-422-A connections. All port parameters are set by software configuration. Sending and receiving of messages is controlled by program logic.

The module provides extensive diagnostic facilities, accessible by a standard web browser, to monitor module status and aid in the detection and correction of errors. The web server provides access to product information, operational statistics, and diagnostic history.

The 2500P-ACP1 uses a Secure Digital (SD) card for storage of module configuration data, executable program, application program source files, and user data files. Because all configuration and operational files are contained on the SD card, the complete module profile can be transferred simply by swapping SD cards.

Embedded client and server protocols can be used for data transfer with other controllers and devices. All message processing for client operation (request triggering, packet send/receive, message validation, data insertion/extraction, and error handling/retries) is performed by the module firmware without the need for any additional logic in the PLC or 2500P-ACP1 application program.

### Features

- Adds IEC-61131 languages, functions, and memory organization features to existing CTI 2500 Series® and SIMATIC® 505 controllers.
- Advanced diagnostics and module status provided by the embedded web server.
- Real-time data logging saves time-stamped variable data to SD-card and automatic FTP file transfer to an external server without interrupting the ACP1 program operation.
- Embedded client/server protocols perform data transfer based on configuration tables without the need for any additional logic in the PLC or 2500P-ACP1 application program.
- High-speed data transfer and RTC time synchronization with CTI controllers..

**ROCK SOLID PERFORMANCE. TIMELESS COMPATIBILITY.**



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## Communications Protocols

- **CAMP Client (TCP, UDP, Multicast)**

The CAMP Client enables reading and writing of memory locations in CTI 2500 Series<sup>®</sup> PLCs or SIMATIC 505<sup>®</sup> controllers (equipped with a CTI Ethernet communication module). You can choose to send requests using TCP, UDP, or UDP multicast.

- **Open Modbus (Client, Server)**

The Open Modbus drivers enables the 2500P-ACP1 to communicate with the wide variety of automation devices that support Open Modbus TCP/UDP protocol.

- **Ethernet/IP Scanner, Adapter, & Tag Cli ( V3.03 firmware and later)**

The 2500P-ACP1 supports connections to up to 40 Ethernet/IP devices via I/O Scanner, I/O Adapter, and Tag Client interfaces. **IMPORTANT NOTE:** Configuring Ethernet/IP communications requires Workbench V1.3 or above.

- **Serial Modbus RTU (Master, Slave)**

The module can communicate to serial Modbus devices using the Modbus RTU protocol and the onboard DB9 serial port.

- **General ASCII Send/Receive**

Provides bidirectional communications with devices that use proprietary serial protocol messages. Data is transmitted/received based on the application logic.

- **TCP/UDP Management Functions ( V3.08 )**

Simple interface to a full set of functions to manage TCP and UDP sockets used for building client/server applications for communications over Ethernet.

- **Network Data Exchange**

Network Data Exchange uses an event-based TCP Publish/Subscribe model to exchange real-time data among CTI 2500 Series<sup>®</sup> processors using 2500P-ECC1 or 2500P-ACP1 modules

- **MQTT (V4.0 firmware and later)**

MQTT Client operation is now supported in the ACP1. MQTT is an ISO standard publish/subscribe messaging protocol designed for connections to remote locations where a “small code footprint” is required and/or network bandwidth is limited.

## Programming

The **CTI Workbench Integrated Development Environment** provides configuration of module parameters and development of the user application program for the 2500P-ACP1.

CTI Workbench is a full-featured development environment with integrated configuration tool, programming editor, debugger, data monitor, and simulator. CTI Workbench is PLCOpen certified, and programs developed using the tool can comply with IEC-61131-3 requirements.

The application program may be developed in any of five IEC-61131 programming languages:

- Ladder Diagram (LD)
- Function Block Diagram (FBD)
- Structured Text (ST)
- Instruction List (IL)
- Sequential Function Chart (SFC)

A complete library of functions is provided to perform the following tasks:

- Complex mathematical computations
- Boolean logic
- File management
- String handling
- Timer/Counter operations
- PID control
- Real-time data logging

CTI Workbench is compatible with Microsoft Windows<sup>®</sup> 7, 8, 8.1, and 10.

## Hardware Specifications

**Module Size:** Single Wide

### Ethernet Ports:

**Number of Ports:** 2 (Switched)

**Connectors:** RJ-45 (Auto-MDIX)

**Speed:** 10Mb or 100Mb (auto-negotiated)

**Duplex:** Half or Full (auto-negotiated)

**Ethernet Storm Protection:** Broadcast/Multicast

### Status LEDs:

**GOOD:** Module Operational Status

**ACTIVE:** Application Program Status

**USER:** Logic-controlled Status

**XMT:** Ethernet Transmit

**RCV:** Ethernet Receive

**LINK:** Link Status (Port 1 and Port 2)

**ACT:** Activity (Port 1 and Port2)

### Status Display:

Three character LED display for system status, error reporting, and IP address.

### Serial Port:

**Connector:** DB-9

**Electrical Interface:** RS-232, RS-422

**Baud Rates:** 1200b -115Kb

**Backplane Power:** 5.0 watts

### Operating Temperature

0-60°C (-40 – 85°F)

### Storage Temp

-40 to 85°C (-40 to 185° F)

### Relative Humidity

5% to 95% non-condensing

### Agency Approvals (pending)

UL, UL-C, CE

Class 1 Div 2

### Shipping Weight

1.5 lb. (0.68 Kg)