



## Ethernet Communications: What is the Best Solution for Your Needs?

### Ethernet and the PLC

Ethernet has become the standard network for data communications on the plant floor, and most modern PLCs offer some form of Ethernet connectivity. Typical uses for Ethernet in PLC systems include:

- Remote programming of the PLC
- HMI/SCADA access
- Peer-Peer communications between PLCs
- I/O communications

There are several solutions available for adding Ethernet connectivity to CTI 2500 Series® and SIMATIC/TI 505® systems. This article explores the capabilities of each solution to help you in selecting the right product for your needs.

### Ethernet Communications Products for SIMATIC/TI 505® and 2500 Series® Systems

There are a number of products that are used for Ethernet communications for CTI 2500 Series® and/or SIMATIC/TI 505® Series systems. Several of the products listed below have been matured and are no longer supported, but they are still in use and included in this article in order to help in comparing the various Ethernet solutions.

### Choose the Right Ethernet Communications Solution for Your Needs

CTI offers a variety of products to add Ethernet connectivity to CTI 2500 Series® and SIMATIC/TI 505® PLC systems. Selecting the correct product depends on your needs, including required communication protocol(s), application(s), and communications speed.

- All CTI 2500 Series® Ethernet products support the 505 Ethernet Protocol also referred to as CAMP or Common ASCII Messaging Protocol
- Speeds vary from 10Mbps to 100Mbps
- Choices range from fast Ethernet interface modules to full-featured co-processing modules to fully compatible 2500 Series® CPUs
- Supported applications include:
  - Peer-to-peer
  - HMI/SCADA access
  - I/O communications
  - Remote programming of the PLC



ROCK SOLID PERFORMANCE. TIMELESS COMPATIBILITY.

Products used for Ethernet communications in CTI 2500 Series® and SIMATIC/TI 505® Series systems:

- CTI 2572 / SIMATIC® 505-CP2572
- CTI 2572-A
- CTI 2572-B
- CTI 2500 Series® Processors
- CTI 2500P-ECC1
- CTI 2500P-ACP1
- SIMATIC 505-1434-TF
- SIMATIC 505-1434-TCP

All 2500 Series® Ethernet solutions with the exception of 505-1434-TF use the 505 Ethernet Protocol. You may see this referred to by different names in the literature:

- ⇒ CAMP (Common ASCII Messaging Protocol)
- ⇒ NITP over Ethernet
- ⇒ SIMATIC 505 Ethernet Protocol

This protocol is fundamentally the old serial Non-Intelligent Terminal Protocol originally developed by Texas Instruments in the 1980's. Over the years, CTI has enhanced it with new commands to optimize response time and throughput.

Although all the solutions support the 505 Ethernet Protocol (except the 505-1434-TF), there are differences between products in the capabilities provided and in other protocols supported. This article summarizes the features of each product in more detail to help you decide on the best solution for your application, and the chart at the end of the article provides a one-page high-level comparison of the existing solutions in an easy-to-read table format.



### CTI 2572 / SIMATIC® 505-CP2572

The CTI 2572 enables Ethernet communication between its host CPU (either a CTI 2500 Series® Cxxx or SIMATIC/TI 505® CPU) and other CTI or SIMATIC TI505 controllers (each additional SIMATIC/TI 505 controller requires its own Ethernet solution in order to communicate over Ethernet), SIMATIC S7 controllers (using CP143

modules), PCs and other 3rd-party units supporting the 505 Ethernet protocol. The 2572 can also directly send email messages.

Common applications for the 2572 include peer-peer communications between PLCs, HMI/SCADA access, programming using Workshop / TiSoft / APT, and communication to S7 PLCs using Send/Receive. The 2572 also supports simultaneous communication to multiple 2572's using a broadcast protocol (Datashare).

The 2572 was introduced in 1995 and matured in 2012. It is still supported but no longer available except as used/refurbished.

Configuration of the module is done offline or from RLL. For peer-peer communications, you must write RLL to initiate communication requests. The module logs in as 2WX/6WY and these words are used to trigger and monitor communications. It supports 10Mbit speeds.

### CTI 2572-A and 2572-B

Like the 2572, both the CTI 2572-A and the 2572-B enable communications over an Ethernet network between the host PLC and other CTI or SIMATIC TI505® controllers (again, each 505 controller must use an Ethernet solution to enable this Ethernet communication), PCs and other 3rd-party units supporting the 505 Ethernet protocol. Like the 2572, it communicates directly over Ethernet to CTI 2500-Cxxx processors. Unlike the 2572, however, it does not support direct Ethernet communications to S7 PLCs.

Common applications for the 2572-A and 2572-B include peer-peer communications between PLCs, HMI/SCADA access, and programming using Workshop / TiSoft / APT. Both modules also support communications to Modbus-TCP devices (as a Modbus "slave" or "server") and communication to Rockwell PLCs using Ethernet/IP. Simultaneous communication with multiple 2572-A's and 2572-B's is possible using IP multicast protocol.

Configuration of the modules is done offline or from RLL. For peer-peer communications, you must write RLL to initiate communication requests. The modules log in as 2WX/6WY and these words are used to trigger and monitor communications. Both support 100Mbit speeds.

The 2572-A was introduced in 2001 and is still supported, but it is no longer manufactured. In June 2016, CTI announced the release of the 2572-B, which is a direct replacement for the 2572-A. The 2572-B includes a more powerful web browser interface and new on-board display of the module IP address.



## CTI 2500P-ECC1

The CTI 2500P-ECC1 enables Ethernet communication between its host CPU (ONLY a CTI 2500 Series® Cxxx CPU—it cannot communicate directly with a SIMATIC TI 505® CPU) and other CTI controllers (SIMATIC TI505 controllers require a 2572, 2572-A, 2572-B, or 505-1434-TCP), PCs and other 3rd-party units supporting the 505 Ethernet protocol.

Common applications include HMI/SCADA access (with extremely fast performance due to the built-in caching of data), and peer-peer communications between PLCs. The module also supports Modbus TCP communications as master or slave, and simultaneous communication to multiple ECC1s using Network Data Exchange protocol.

It was introduced in 2013 and is still manufactured and supported.

Configuration is done offline using a free configuration utility. A big benefit of using the ECC1 over previous Ethernet solutions is that it requires no PLC programming to perform peer-peer communications. It supports 100Mbit speeds.

## CTI 2500P-ACP1

The CTI 2500P-ACP1 enables Ethernet communication between its host CPU (CTI 2500 Series® Cxxx CPU or Simatic/TI 505® - with restrictions) and other CTI controllers (SIMATIC TI505 controllers require a 2572, 2572-A, 2572-B, or 505-1434-TCP), PCs and other 3rd-party units supporting the 505 Ethernet protocol. It communicates directly over Ethernet to CTI 2500-Cxxx processors.

As a fully programmable module, the APC1 can function as a coprocessor, working in cooperation with the main process PLC but running an independent and complementary logic scan. Up to 1000 PLC registers can be read/written on each PLC scan. It also features a simple-to-use Ethernet TCP Management interface that allows the user to develop customized Ethernet communications for communicating with a wide variety of third-party devices using a custom protocol.

Common applications include peer-peer communications between PLCs, communication with Rockwell PLCs, and control of Modbus-TCP devices and Ethernet/IP devices. The module also supports simultaneous communication to



multiple ACP1s or ECC1s using Network Data Exchange protocol. The 2500P-ACP1 was introduced in 2014 and is still manufactured and supported. It is configured offline using the CTI Workbench Integrated Development Environment for IEC-61131

## CTI 2500 Series® Processors

CTI 2500 Series® Processors can communicate over an Ethernet network with other CTI or SIMATIC TI505 controllers (both must use a 2572, CP2572, 2572-A, 2572-B or 505-1434-TCP modules), PCs and other 3rd-party units supporting the 505 Ethernet protocol.

Common applications include HMI/SCADA access and programming using Workshop / TiSoft / APT. The product was introduced in 2007 and is still manufactured and supported. It supports 100Mbit speeds.

## SIMATIC® 505-1434-TF (H1 Module)

The 505-1434-TF (H1 module) enables Ethernet communications over an H1 Ethernet network between its host PLC (SIMATIC/TI 505® or CTI 2500 Series® Cxxx – with restrictions) and other SIMATIC TI505 controllers, SIMATIC TI575 control systems, SIMATIC S5 controllers with CP143 modules, CP1413 Ethernet boards for PCs, and other 3rd-party units supporting H1 protocol.

Common applications include peer-peer communications between PLCs, HMI/SCADA access (PC must have CP1413 card installed and appropriate driver), and programming using TiSoft, APT, or Workshop.

The module was introduced in the early 1990s and matured in 2003. It is no longer supported and is available only as used/refurbished.

The 1434-TF requires configuration using offline Windows software. For peer-peer, you must also write RLL to initiate communication requests. The module logs in as 4WX/4WY and these words are used to trigger and monitor communications.

A big drawback to using the 1434-TF is that it requires an H1 card in remote PCs for programming and HMI/SCADA access, and also requires an external AUI media converter to support standard twisted-pair Ethernet cabling. It communicates at 10Mbit speeds.



## SIMATIC® 505-1434-TCP

The 505-1434-TCP module enables Ethernet communications between its host PLC (either a CTI 2500 Series® or SIMATIC/TI 505® controller) and other CTI or SIMATIC TI505® controllers, SIMATIC S7 controllers (with CP343-1), PCs, and other 3rd-party units supporting the 505 Ethernet protocol. It can also send email messages.

Common applications include peer-peer between SIMATIC 505 PLCs, peer-peer with S7 controllers, and HMI/SCADA access.

It was introduced in the late 1990s and matured in 2003. It is no longer supported and is available only as used/ refurbished.

The 1434-TCP requires configuration using offline Windows software. For peer-peer, you must also write RLL to initiate communication requests. The module logs in as 4WX/4WY and these words are used to trigger and monitor communications. It requires an AUI media converter to support standard twisted-pair Ethernet cabling, and supports 10Mbit communications.

## Continuous Evolution

CTI continues to invest in the development of Ethernet communications technology for the 2500 Series® system. With recent enhancements to our 2500P-ACP1 Coprocessor module (to add new protocols) and the introduction of the 2572-B (to continue support for the widely-used 2572-A), we remain committed to offering the latest in capability and performance in Ethernet communications.



Please do not hesitate to contact us if we can be of any assistance. We appreciate your business.

## CONTROL TECHNOLOGY, INC.

5734 Middlebrook Pike  
Knoxville, TN 37921 USA  
+1.865.584.0440  
[www.controltechnology.com](http://www.controltechnology.com)  
[sales@controltechnology.com](mailto:sales@controltechnology.com)

Copyright© 2016 Control Technology, Inc.  
All Rights Reserved

26JULY2016



ROCK SOLID PERFORMANCE. TIMELESS COMPATIBILITY.

## Comparing 2500 Series® Ethernet Solutions

	2572	2572-A	2572-B	2500 Series® CPU	2500P-ECC1	2500P-ACP1	505-1434-TF	505-1434-TCP
<b>Applications Supported</b>								
<i>PLC programming</i>	✓	✓	✓	✓			✓	✓
<i>HMI/SCADA access</i>	✓	✓	✓	✓	✓		✓	✓
<i>Peer-peer (CAMP)</i>	✓	✓	✓	✓ <sup>6</sup>	✓	✓		✓
<i>Peer-peer (other)</i>	✓ <sup>1</sup>	✓ <sup>2</sup>	✓ <sup>2</sup>		✓ <sup>2,3</sup>	✓ <sup>2,3</sup>	✓	
<i>Communication to SIMATIC/TI 505® CPU over the backplane</i>	✓	✓	✓			✓	✓	✓
<i>Communication to Rockwell PLCs</i>		✓ <sup>4</sup>	✓ <sup>4</sup>			✓ <sup>5</sup>		
<i>Communication to S7</i>	✓							✓
<i>Email</i>	✓							✓
<i>Communication to Modbus TCP devices</i>		✓ <sup>9</sup>	✓ <sup>9</sup>		✓	✓		
<i>Communication to Ethernet/IP devices</i>		✓ <sup>4</sup>	✓ <sup>4</sup>			✓ <sup>5</sup>		
<b>Protocols Supported</b>								
<i>505 Ethernet (aka CAMP, NITP)</i>	✓	✓	✓	✓ <sup>7</sup>	✓	✓ <sup>8</sup>		✓
<i>Multicast</i>		✓	✓		✓	✓		
<i>Network Data Exchange</i>					✓	✓		
<i>Data Share</i>	✓							
<i>Modbus-TCP</i>		✓ <sup>7</sup>	✓ <sup>7</sup>		✓	✓		
<i>Ethernet/IP</i>		✓ <sup>4</sup>	✓ <sup>4</sup>			✓ <sup>5</sup>		
<i>H1</i>							✓	
<b>Communicates Directly With (Over Ethernet)</b>								
<i>2572</i>	✓	✓	✓	✓	✓	✓		✓
<i>2572-A</i>	✓	✓	✓	✓	✓	✓		✓
<i>2572-B</i>	✓	✓	✓	✓	✓	✓		✓
<i>2500 Series® CPUs</i>	✓	✓	✓		✓	✓		✓
<i>2500P-ECC1</i>	✓	✓	✓	✓	✓	✓		✓
<i>2500P-ACP1</i>	✓	✓	✓	✓	✓	✓		
<i>505-1434-TF</i>							✓	
<i>505-1434-TCP</i>	✓	✓	✓	✓	✓	✓		✓
<b>Other</b>								
<i>For Direct Use with SIMATIC TI505®</i>	✓	✓	✓			✓	✓	✓
<i>Webserver for diagnostics</i>		✓	✓	✓	✓	✓		
<i>OPC/DDE support</i>	✓	✓	✓	✓	✓		✓	✓
<i>100Mbit speed</i>		✓	✓	✓	✓	✓		
<b>Availability</b>								
<i>Manufactured and supported</i>			✓	✓	✓	✓		
<i>Support Only</i>	✓	✓						
<b>Notes</b>								
<sup>1</sup> Datashare protocol								
<sup>2</sup> IP Multicast								
<sup>3</sup> Network Data Exchange								
<sup>4</sup> Supports accessing V memory using CIP DATA TABLE READ and CIP DATA TABLE WRITE messages								
<sup>5</sup> Supports connections to Ethernet/IP devices via I/O Scanner, I/O Adapter, Explicit Message Adapter, and Tag Client interfaces								
<sup>6</sup> CPU supports "server only" for peer-peer								
<sup>7</sup> Supports "server" operation only								
<sup>8</sup> Supports "client" operation only								
<sup>9</sup> Supports "slave" operation only								

