

The Trident's Main Processor and Communication Module support Modbus, Ethernet, Peer-to-Peer, and TriStation protocols.



## Communication Capabilities

The Trident controller provides state-of-the-art communication capabilities through communication ports on the Main Processors and Communication Modules. Ports on the MP support TriStation and Modbus slave protocol. Ports on the CM support TriStation, TSAA client/server (DDE Server and OPC Server), Peer-to-Peer, Time Synchronization, JetDirect printing, and Modbus master/slave protocols.

Depending on application requirements, the Trident can communicate with the following:

- OPC Server for Triconex
- Any Modbus master, including DCS from Foxboro, Honeywell, ABB, Bailey, Fisher-Rosemount and Yokogawa
- A TriStation programming workstation through TriStation (Ethernet) protocol
- Other Trident and Tricon controllers through the Triconex Peer-to-Peer protocol
- External devices using TSAA which is a Triconex master/slave protocol used by devices on an Ethernet network

### TSAA Client/Server Protocol

Triconex System Access Application is a master/slave protocol that allows an external device acting as a master to communicate with one or more Trident controllers. Typically, a client/server workstation connects to a DCS client

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Type of Connection	MP Only	One CM	Two CMs
Trident as Modbus Slave	3 serial ports	3 serial ports	6 serial ports
Trident as Modbus Master	not available	3 serial ports	6 serial ports
Trident as Modbus Master/Slave	not available	3 serial ports	6 serial ports
Trident as Modbus Master or Slave using TCP <sup>a</sup>	not available	2 Ethernet ports	4 Ethernet ports
TriStation communication using serial connection	not available	1 serial port <sup>b</sup>	2 serial ports <sup>b</sup>
TriStation communication using TCP/IP protocol	3 Ethernet ports	2 Ethernet ports	4 Ethernet ports
TSAA Client/Server or TSAA Client/Server with IP Multicast communication	not available	2 Ethernet ports	4 Ethernet ports
Peer-to-Peer communication—for one network of Triconex controllers only—using UDP/IP <sup>c</sup> or DLC	not available	2 Ethernet ports	4 Ethernet ports
Triconex Time Synchronization via DLC	not available	1 Ethernet port <sup>d</sup>	2 Ethernet ports <sup>d</sup>
Triconex Time Synchronization using UDP/IP or SNTP Triconex Time Synchronization	not available	2 Ethernet ports	4 Ethernet ports
HP JetDirect Printing	not available	2 Ethernet ports	4 Ethernet ports

a. Maximum of four Modbus TCP ports.

b. Serial 3 only.

c. NET1 or NET2 can be configured for Peer-to-Peer using UDP/IP, but not both at the same time.

d. NET1 only.

using TSAA protocol to access point data in the Trident controller.

Two client/server programs, DDE Server and OPC Server, use TSAA.

### OPC Server for Triconex

OPC Server for Triconex is an OPC-compliant product available from

Matrikon. OPC stands for OLE for Process Control which is a standard set of non-proprietary interfaces used to develop client/server programs. OPC Server allows read and write access to Trident input, output, and memory variables, and system attributes.

# Communication Capabilities

## Serial Port Specifications

Mode	MP	CM
RTU	✓	✓
ASCII		✓
RS-232	✓	✓
RS-485	✓	✓
Master		✓
Slave	✓	✓
Point-to-Point	✓	✓
Multi-drop		✓

OPC clients which conform to OPC version 2.0 for Data Access and version 1.0 for Alarms and Events Handler can communicate with a Trident through the OPC Server.

For more information on OPC Server for Triconex and OPC client applications, see the Matrikon Web site at [www.matrikon.com](http://www.matrikon.com).

## DDE Server for Triconex

Triconex DDE Server is a Windows (2000 or XP) application that enables DDE-compliant clients to read and, if allowed, to write data to a Triconex control program. A client can read input, output, and memory variables, and system attributes.

Client applications use DDE (Dynamic Data Exchange) protocol to communicate with a DDE Server. Any Windows application that supports DDE protocol—such as Microsoft Excel—can use Triconex DDE Server.

Triconex DDE Server communicates with one or more Triconex controllers through TSAA protocol. To return data to clients, the DDE Server uses DDE protocol.

## Modbus Communication

Modbus is an industry-standard master/slave protocol that is traditionally used for energy management, transfer line control, pipeline monitoring, and other industrial processes.

A Trident controller can operate as a Modbus master, slave, or both. A DCS typically acts as the master while the Trident controller acts as the slave. The master can also be an operator workstation or any general-purpose computer programmed to support Modbus devices.

Serial ports on the MP, and serial ports and network ports on the CM, support Modbus communication.

## TriStation Communication

TriStation protocol uses TCP/IP for CM ports and DLC for MP ports to enable communication between a TriStation PC and a Trident controller. TriStation 1131 Developer's Workbench is used to develop, download, operate, and monitor projects for the Trident controller.

The TriStation program must be installed on a PC that is running Windows NT, 2000, or XP and is

connected to a CM or MP port on the Trident controller.

TriStation is compliant with the IEC 61131 International Standard for Programmable Controllers.

## Peer-to-Peer

Triconex Peer-to-Peer protocol allows Trident and Tricon controllers in a closed network to exchange a limited amount of process control data. The controllers in a Peer-to-Peer network can be time-synchronized with the master node (the controller with the lowest node number). Peer-to-Peer protocol supports a maximum of 31 Triconex controllers.

## Upgrades to Flash ROM

The CM firmware stored in the Flash ROM can be upgraded by connecting an Ethernet port to a PC which is running the Triconex Firmware Manager.

## Communication Interfaces

Interface	MP	CM
Modbus Serial Port (RS-232/RS-485)	✓	✓
Ethernet Port (10BaseT IEEE 802.3)	✓	✓
Ethernet Port (10BaseT/100BaseTX Auto-negotiable IEEE 802.3)		✓
Attachment unit interface (AUI) for MAU		✓
Media independent interface (MII) for MAU		✓
Debug port	✓	✓