2572 Installation and Setup Instructions

The CTI 2572 module can be setup in a variety of ways to perform various communications functions. All features can be configured via software and some features can be configured without the use of any software other than logging the module into the PLC I/O configuration. Some functions require software to control the operation of the module.

The 2572 provides a standard PLC logic interface for sending messages and processing responses. The PLC command interface consists of two parts:

1. The module WX/WY words that are used to control command execution and monitor command and module status.

2. Command blocks or contiguous V memory locations that store command parameters.

The 2572 module logs into the PLC as a special function module and is assigned 2 WX and 6 WY words. The WX words are status words for the module and commands. The first WY word is the module control word, the second WY word is the command control word. The remaining WY words are "command slots" and are loaded with the V memory starting address of the Command Block to be executed.

The command control word (second WY word) is divided into four groups of 4 bits. Each group controls command processing for command slots 1 through 4. Setting bits in each group provides the means to trigger commands, abort commands, acknowledge errors, and couple the command with PLC logic.

Typical command sequences require loading the starting V memory address of the command block in the command slot, then triggering the command with bits in the command control word. If any errors occur they must be acknowledged using the command control bits before additional commands are processed.
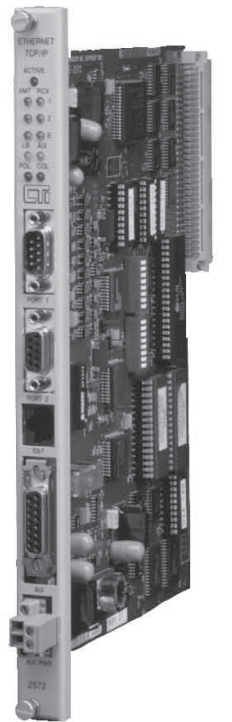
Physical Configuration

The module provides connections for two serial ports and two Ethernet ports.

The serial ports can be used to access PLC memory locations, configure the module for automatic startup, or to run diagnostic programs for the 2572 module. The top serial port is an RS-232 interface while the bottom serial port is RS-422, both serial ports require a DB9 connector.

Programs that use the NITP protocol can use the serial ports as if they were directly connected to the PLC programming port.

Both serial ports can be active at the same time but heavy traffic on the serial ports will degrade the Ethernet performance.

Ethernet communications can be established via the 10Base-T port using unshielded twisted pair conductors and an RJ-45 connector, or via an AUI port that can connect to a transceiver and any desired Ethernet medium including coax, unshielded twisted pair and fiber optic.

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Baud rates for the 10Base-T port can be established at 10 or 100 megabits, and the cable can be connected to any standard 10Base-T hub to establish a network connection.

Only one of the Ethernet ports is operational at a time, with precedence given to the 10Base-T port. The 2572 module automatically selects the Ethernet port for use by detecting the linkbeat signal. If the linkbeat signal is detected on the 10Base-T port, the module will automatically use the 10Base-T port for Ethernet communications. If the linkbeat signal is not detected, the 2572 module will automatically fail over to the AUI port for communications. This feature allows the use of redundant cabling with automatic fail over.

The AUI transceiver is typically powered from the AUI port using backplane power. A connector is provided to attach an external 12-volt power supply to power the transceiver in those situations where backplane power conservation is required.

Initializing the 2572 Network Server

Configuring the 2572 module to communicate may require three separate steps depending on how the module is to be used.

The network server software must be started for every module. The network server software provides the module with an IP address and initiates module to PLC communications. The Network Server can be configured either via dip switches or software, the main difference between the two methods is the location of the IP address. If the server is started via dip switches, the IP address must be programmed via the serial port on the module using the IPSET program on the diagnostics diskette. Starting the server this way stores the IP address in the 2572 module EEPROM, and the IP address will remain with the module if it is moved. If the server is started via software, the PLC software provides the IP address, which stays with the PLC if the module is moved or replaced.

Once the Network Server software is started, no additional steps are required for the module to act as a server, and will respond to any valid IP request.

For more information on Initializing the 2572 Network Server, refer to the CTI 2572 Ethernet TCP/IP Installation and Operation Guide.

Creating the OP Socket

To transform the CTI 2572 into an IP client which will initiate IP communications with other modules on the network, some additional programming is required in the following form:

1. A Command table must be set up in order to establish an Internet connection or socket.

2. A Command table must be set up to initiate memory transfers.

Two types of Internet Sockets are possible. The TCP (connection-oriented delivery) socket requires a physical connection to the remote node referenced in the command or an error will be returned. If UDP (connectionless delivery) is selected, the 2572 stores the address and port number in the command block as the default socket but no connection attempt is made.

For a description of the create socket command block and more information on creating the IP socket, refer to the CTI 2572 Ethernet TCP/IP Installation and Operation Guide.

Transferring Data between PLCs

To transfer data between PLCs the client (master) 2572 module initiates memory transfer commands as defined in the command blocks. Each command block defines the type and amount of memory to be transferred as well as the remote node to transfer to/from.

PLC programming is necessary to control the polling cycle and communications errors that may be encountered.

For a description of the transfer memory command block and more information on transferring memory registers between PLCs, refer to the CTI 2572 Ethernet TCP/IP Installation and Operation Guide.

Flow Diagram CTI Test:

1. Start Network Server (trigger the "Start Network Server" command) to establish network protocol and IP address for each module. This is done via PLC logic in a command block starting at V500, 600, and 700 for modules 1, 2, and 3 respectively. Bit 3 of diagnostic word 1 and a blinking LED on the front of the module indicate that a network configuration (net config) is needed.

    Once the network server is started for the module, no further programming is necessary for that module to act as a server/slave. To set the module up as a client/master a create socket command must be created and executed, and one or more memory transfer commands must be created and triggered.

2. Execute the "Create Socket Command" to establish a local TCP/IP socket and port. This is only necessary for client/master modules. If the create socket command specifies the socket as TCP, a physical connection to the remote socket specified in the command block must be established. If UDP is specified in the create socket command, the physical address of the remote node is determined when the transfer memory commands are executed. For this test the create socket command block starting address for module 1 is at V520. Create socket commands are not issued for modules 2 and 3 since they are acting strictly as servers/slaves.

3. Execute a "Memory Transfer Command" to transfer values stored in the PLC memory between modules. The Memory Transfer Commands are set up in blocks of V memory and indicate the type of transfer (read or write), remote node address, starting memory location, number of words to transfer, and memory storage area after transfer. For this test three memory transfer blocks have been set up for the client/master at V540, V560, and V580. Logic in the PLC loads the module command slot with the memory transfer command starting address and then triggers the command. Status bits associated with the module are monitored by the PLC program to indicate completion of the memory transfer. Once the memory transfer is complete, the PLC logic loads the module command slot with the starting address of the next command block and triggers the command. The command slot loading and command triggering is controlled in the PLC and cycles through the following command blocks:

    Block 1   Command block starting V memory address V540,
                    Reads 256 words of V memory starting at V5000 from remote address
                    198.171.173.101.
                    Stores the transferred memory in V5500.

    Block 2   Command block starting V memory address V560,
                    Reads 256 words of V memory starting at V6000 from remote address
                    198.171.173.101.
                    Stores the transferred memory in V6500.

    Block 3   Command block starting V memory address V580,
                    Reads 256 words of V memory starting at V7000 from remote address
                    198.171.173.101.
                    Stores the transferred memory in V7500.