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# CTI 2500 QUICK START – INSTALLATION GUIDE

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## Purpose of this Document

This document is designed to assist you in unpacking and installing the CTI 2500 controller. For additional information, see the *CTI 2500 Installation and Operation Guide* and the *CTI 2500 Programming Reference Manual*, available on our CTI web site at [www.controltechnology.com/support/manuals/](http://www.controltechnology.com/support/manuals/).

## Introduction

The CTI 2500 is an advanced function controller that combines the features of a programmable logic controller and a loop controller. It is especially suitable for process control applications that require discrete control as well as analog control.

## Unpacking the Module

Open the shipping carton and remove the special anti-static bag that contains the module. After discharging any static build-up, remove the module from the static bag. Do not discard the static bag. Always use this bag for protection against static damage when the module is not inserted into the I/O base.

**CAUTION:**

***The components on the CTI 2500 controller can be damaged by static electricity discharge. To prevent this damage, the module is shipped in a special anti-static bag. Static control precautions should be followed when removing the module from the bag and when handling the printed circuit board during configuration***

## Setting the CTI 2500 Switches

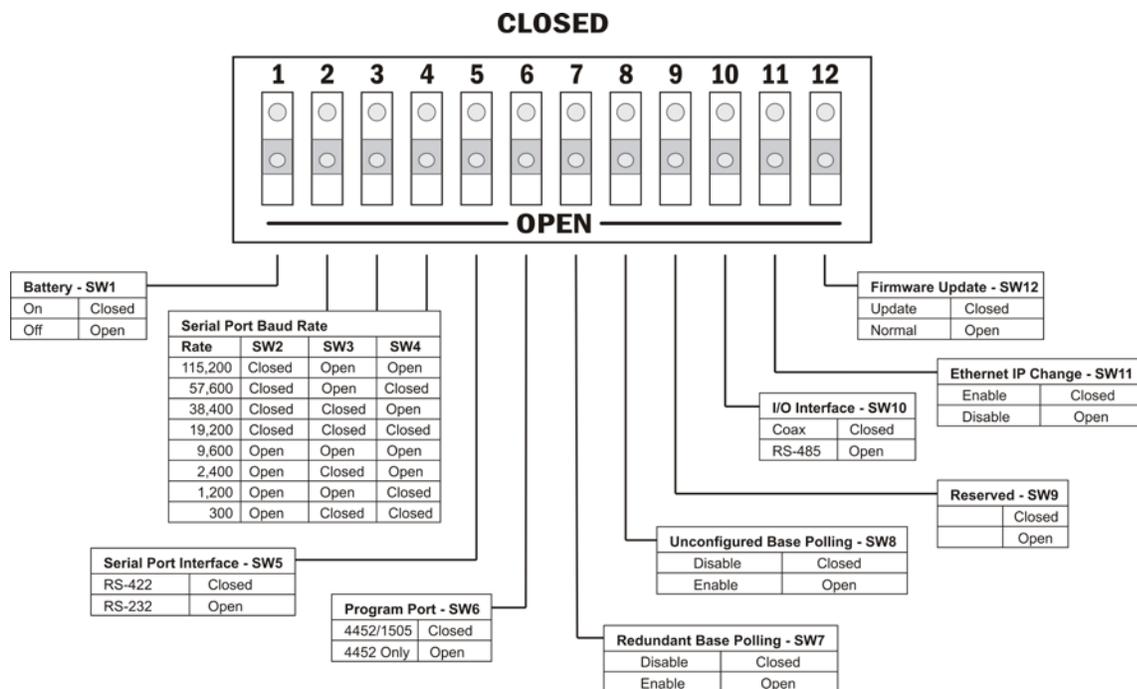
Switches on the CTI 2500 are used to select the following

- Battery Power
- Serial Port Baud Rate
- Serial Port Electrical Interface
- Program Port Selection
- Remote I/O Connection
  - Firmware Update

See *Figure 1* to locate the switchblock. *Figure 2* shows the individual switch settings. See the *CTI 2500 Installation and Operation Guide* for additional information.



**Figure 1. Switchblock Location**



**Figure 2. Option Switches**

**Battery (SW1)**

Set the battery switch to the closed position to enable the battery.

**Baud Rate (SW2 – SW4)**

For most applications, you should set the baud rate to 115, 200. If you are experiencing communications problems, you may need to reduce the baud rate.

**Serial Port Electrical Interface (SW5)**

For typical programming applications, you should set this switch to the RS-232 position (open).

**Program Port Selection (SW6)**

When SW6 is open, TCP port 4452 is used as the programming port. If you need to use TCP port 1505 as the programming port, set this switch to the closed position.

**SW7 –Redundant Base Polling (firmware version 7.07 and above)**

Switch 7 allows you to reduce the I/O scan time of the CTI 2500 controller in I/O configurations that use only one Remote Base Controller (RBC) per base. When the switch is set to the **CLOSED** position, the CTI 2500 controller will not poll the standby RBC in each base. This eliminates the timeout delay introduced by polling an RBC that is never present. If Switch 7 is in the **OPEN** position, the CTI controller will always poll the standby RBC.

**CAUTION:**  
*If you are using an I/O configuration that uses redundant RBCs (two RBCs per base), the switch must be in the OPEN position for the redundancy function to work properly.*

## SW8 – Unconfigured Base Polling (firmware version 7.07 and above)

Switch 8 allows you to reduce the I/O scan of the CTI 2500 controller by not polling bases that are enabled but unconfigured. This capability is especially important for APT users needing to reduce scan time, since APT programming software does not provide a means to manually disable a base.

When Switch 8 is set to the **CLOSED** position, unconfigured bases will not be polled. When the switch is set to the **OPEN** position, all enabled I/O bases will be polled, regardless of their configuration state.

## Reserved Switch (SW9)

These switches are reserved for future use and should be set to the open position

## I/O Interface (SW10)

Set this switch to the open (RS-485) position if you are using RS-485 shielded twisted pair to connect to remote base controllers. Set this switch to the closed (Coax) position if you are connecting to remote base controllers via coaxial cable using a Siemens SIMATIC 505-6850 I/O Channel Converter.

### NOTE:

*Setting the switch to the Coax position while connecting via RS-485 will cause the I/O update to slow down considerably.*

## Ethernet Port IP Address Change Enable (SW11)

This switch controls whether the IP parameters (IP Address, Subnet Mask, and Default Gateway) can be changed via the local Ethernet port. In the Open position changing the IP parameters via the Ethernet port is prohibited. In the Closed position, PLC Workshop or the embedded web server can be used to change the parameters.

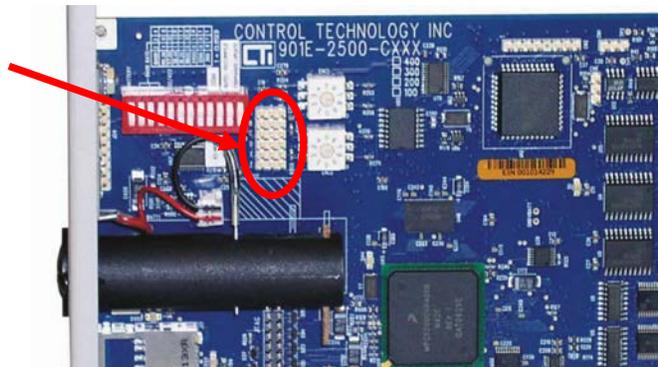
## Firmware Update (SW12)

This switch should be set to the open position for normal operation.

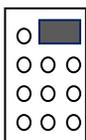
## Setting the User Jumpers

Similar in function to the user switches, user jumpers allow you to modify the operation of the controller. A jumper is used instead of a dipswitch where the modified behavior is not commonly used or to prevent the user from inadvertently selecting the modified behavior.

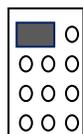
The user jumpers are located next to the user switches (labeled as J20). A jumper is **OPEN** when the jumper is not installed or is located in the right hand position. A jumper is **CLOSED** when the jumper is in the left hand position. See the illustration below.



**Open**



**Closed**



Jumper	Use	Open	Closed	Comments
<b>A</b>	Selects whether the controller reports SIMATIC 505 model-equivalent memory capacity or APT Expanded Memory capacity when queried by task code 6D.	SIMATIC 505 Model Equivalent Memory	APT Expanded Memory  <b>See Note 1 below</b>	APT Expanded Memory Mode will not work properly with legacy 505 Workshop versions.  Changes to APT files are required to use the larger APT Expanded Memory and additional control relays.. Contact CTI.
<b>B</b>	Printer Port Selection	The serial port functions as a programming port	The serial port functions as a printer port	When the serial port is selected as a "Printer Port" it will not respond to task code or other requests. It is output only.
<b>C</b>	Ethernet Port Auto-Crossover Enable	Auto-Crossover is Disabled. The port uses MDI mode	Auto-Crossover is enabled	The Ethernet port operates most reliably in MDI mode. In MDI mode the port can connect to switches and hubs using a standard straight-thru cable and all other devices that support that support auto-crossover capability. Auto-crossover should be enabled on the processor Ethernet port only in exceptional cases.
<b>D</b>	Used to clear all IP parameters (IP Address, subnet mask, default gateway)	No Action	Clears IP parameters during power up start.	See the CTI 2500 IOG for additional information.
<b>E-F</b>	Reserved			Leave in the Open position

**Note 1:** Model C400 controllers with firmware version 8.01 and above will also report additional control relays (C32769 – C56320) when Jumper A is closed.

## Installing the Battery

**NOTE: Beginning July 14 2014, CTI 2500 controllers are being shipped with the battery installed and the battery switch in the disabled position. If the battery is installed you can skip this step. You must set the battery switch (SW1) to the ON position to enable battery backup.**

The battery and the battery cover are shipped in plastic bags contained in the controller shipping box. Remove these items from the bag. Insert the battery into the battery holder with the button end (+) facing outward. Align the battery cover tabs with the slots in the holder. Press the cover in until it is flush with the holder and rotate it 90° in a clockwise direction. You may insert a coin or a screwdriver into the slot on the cover to aid in rotating the cover.



## Physical Installation and Test

After completing the above, install the CTI 2500 controller module into the base. The controller must be in the slot next to the power supply.

**NOTE:**  
The controller will not work in any slot other than the one next to the power supply.

### Inserting the Controller into the I/O Base

Remove AC power from the rack. Align the circuit board with the connector next to the power supply. Slide the controller into the rack until the connector seats. Use the thumbscrews to secure the controller in the rack.

### Initial Power On

Apply power to the base power supply. The POWER GOOD LED on the power supply should illuminate, indicating that power is being supplied to the base connectors. The controller will take a few seconds to complete the startup sequence.

### Module Status Indicators

When this is complete, the status indicators should be in the state as shown in the table below:

Indicator	State	Comments
CPU GOOD	ON	If the CPU Good LED is off, check the Multi-Segment Display (MSD). If the MSD is displaying FE, a fatal error is present and must be cleared. See the CTI 2500 IOG for additional information.
RUN	OFF*	* If this is the first time you have powered the controller since installing the battery, the controller will be in Program mode and the LED will be OFF. Otherwise, the controller will be in either PROGRAM or RUN mode, depending on the state at power down.
BATTERY GOOD	ON	If a good battery has been installed <b>and</b> the Battery Switch has been set to ON, this LED will illuminate. If the LED is off, the battery is missing or bad or the battery switch is off.



The Multi-Segment Display (MSD) should display the four octets of the IP address, three characters at a time. For example, if the IP address is set to 192.10.100.1, the MSD will display 192 then 010, then 100, and then 001. If no IP address has been set, the MSD will display an IP address of 000.000.000.000. Firmware version 8.02 and above will also display the network mask in CIDR format. The CIDR number will be preceded by an underline character “\_”. See the *CTI 2500 Installation and Operation Guide* for additional information regarding CIDR format.

**NOTE:**  
If the MSD displays “U01”, the controller is in Firmware Update mode. Remove power, set SW12 to the closed position, and re-apply power to the controller.  
If the MSD displays “Enn” (where n represents a number), an error has occurred during startup. See the *Installation and Operation Guide* for steps to clear the error.

## Setting the Controller IP Parameters

### Using the Serial or USB Port

When connected to the serial or USB port, you can set the IP address and other IP parameters using PLC Workshop (V4.11 or greater) or IPSET, a standalone utility that you can download from the CTI web site.

### Using the Ethernet Port

Firmware version 8.02 and above allows you to set the IP address and other IP parameters when connected to the Ethernet port. To enable this capability, SW11 must be set to the closed position. You can change the parameters using PLC Workshop (V4.11 or greater) or by accessing the 2500 controller embedded web server with your PC web browser.

## Automatic IP Address Assignment

The 2500 controller is shipped from CTI with the IP parameters cleared. After you power up the controller, the IP address will be displayed as 0.0.0.0. When you connect the Ethernet port to a switch or PC, the controller will automatically generate a temporary IP address. You can connect to this address to set a permanent IP address. The address will be selected from a range of "Link-Local" addresses reserved for this purpose (169.254.1.0 to 169.254.254.255) with a subnet mask of 255.255.0.0 (/16).

**NOTE:**

*The link-local address range is automatically used by Microsoft Windows when an IP Address cannot be automatically obtained from the network DHCP server.*

You can use Windows Control Panel to set your PC to a static address that is compatible with the selected address. A compatible address is:

- Within the Link-Local Range above,
- Not the same as the PLC IP address (displayed on the MSD),
- Uses the same subnet mask (255.255.0.0)

Alternately, if your PC is using DHCP to obtain an IP address, you can automatically connect using the following method:

1. Connect an Ethernet cable from the PC to the 2500 controller Ethernet port.
2. Reboot the PC.

**NOTE**

*Depending on the PC configuration, it may take several minutes before the PC stops attempting to contact a DHCP server and generates the link-local address. You can confirm when this is done by opening the Command Prompt box and typing IPCONFIG.*

## Programming Software

Workshop (from FasTrak Softworks), TISOFT, or APT may be used to program the CTI 2500 controller. TISOFT and APT provide access to features compatible with Siemens SIMATIC 505<sup>®</sup> controllers. Workshop provides access to the advanced features of the controller. See the *CTI 2500 Installation and Operation Guide* and the *CTI 2500 Programming Reference Manual* for additional information.

## Programming Ports

Depending on the programming software being used, you can program the CTI 2500 via the USB port, the Ethernet port, or the RS-232 serial port. When using TISOFT, the RS-232 port is the only option. When using APT, the RS-232 port or the Ethernet port can be used. Programming with APT over the Ethernet port requires the installation of CTI APTNet on the PC. Workshop allows you to program the CTI 2500 using USB, Ethernet, or RS-232 ports.

In order to use the USB port, you must install a CTI USB device driver on your PC. This driver may be downloaded from [www.controltechnology.com/downloads](http://www.controltechnology.com/downloads).



### WARNING

**The USB Port is for temporary connection only.  
Do not use, connect, or disconnect unless area is known to be non-hazardous.  
Connection or disconnection in an explosive atmosphere could result in an explosion.**

## I/O Support

The CTI 2500 supports CTI 2500 Series I/O, Siemens Series 505<sup>®</sup> I/O, and Profibus DP I/O. See the *CTI 2500 Installation and Operation Guide* for detailed information.

## Firmware Update

Prior to using the CTI Controller, you should verify that the controller firmware is current. The firmware version number for the controller may be obtained by displaying Status Word 260 and Status Word 261 using your programming software or by using your web browser to access the web server embedded in the CTI 2500 controller. You may determine the current firmware level by accessing the CTI web site - [http://www.controltechnology.com/support/software\\_revision/](http://www.controltechnology.com/support/software_revision/).

If newer firmware is required, you may obtain it directly from the CTI web site - [www.controltechnology.com/downloads](http://www.controltechnology.com/downloads). The *CTI 2500 Installation and Operation Guide* includes a chapter that explains how to update your firmware.

## Technical Assistance

If you need assistance from CTI please email CTI Technical Support at [support@controltechnology.com](mailto:support@controltechnology.com) or contact call us at 865-584-0440 or 800-537-8398 (USA only).