# **Application Note:** Connecting to a 2500 Series™ Processor using PLC Workshop

This application note will describe a step by step process for the three ways to connect to a 2500-CXXX with PLC Workshop. The three connection types are:

- RS-232
- USB
- Ethernet

## Connecting to the RS232 port

Attach an standard 9-pin "null modem" cable from the comm. port of the PC to the RS-232 port on the PLC. A "null modem" cable swaps TxD/RxD pins on each end of the cable.

## **Serial Port Pinout**

The serial port supports both the RS-232 and RS-422 electrical interface. The electrical interface in use is selected by a dipswitch setting (see Section 2.4 of the IO guide). The cable used with the Interface must connect to the correct pins used by the electrical interface. See the following pinout diagram.



Open PLC Workshop and click on FILE – OPEN Select CONNECT TO PLC – Select SETUP

Open Program
Program File: Browse
Address Documentation
Path: Advanced
Program Type C Offline C Connect to PLC Connection Method [COM1] Setup
Use File Associated Connection Settings
Options
Transfer Logic to PLC
T Read all NOPs
OK Cancel



Control Technology Inc. 5734 Middlebrook Pike, Knoxville, TN 37921-5962 Phone: +1.865.584.0440 Fax: +1.865.584.5720 www.controltechnology.com Click the radio button for comm. ports - Select the port # - Click OK

Communications Setup					
Online Selection					
-	Serial Ports Port:				
<b>/</b>	Serial TIWAY				
••• O	TCP/IP				
<b>.</b> 0	FMS				
	H1				
OK Cancel					

Port:	
COM1	•
COM1	~
COM2	31
COM3	
COM4	
COM5	
COM6	
COM7	
COM8	
COM9	
COM10	~

Verify your settings and click OK

Open Program 🛛 🗙
Program File: Browse Address Documentation Path: Advanced
Program Type  Offline  Connect to PLC  Connection Method  [COM1]  Use File Associated Connection Settings
Options Transfer Logic to PLC Read all NOPs
OK Cancel

You should now be online with the PLC.

## **Connecting to the USB Port**

The USB port connector is identical to the port you find on peripheral devices such as printers. You can connect your computer to this port using a standard USB cable. USB is often preferable to RS-232 because no user configuration or special cables are required. A special PC driver, which emulates a Windows COM port, is required in order to communicate via the USB port.

#### Installing the CTI USB Driver

Before you can use the USB port for programming, you must install the CTI-supplied driver on the PC. This driver provides an interface to the application program that emulates a standard COM port. Using this driver, Workshop can access the USB port in the same manner as the traditional serial port. CTI currently provides a driver for Windows XP. A driver for Windows Vista will be available at a future date.

#### **Obtaining the Driver Installation File**

You may obtain the USB driver by downloading the driver installation file from the CTI web site (www.controltechnology.com). The driver file can be stored on a removable device or copied directly to the hard drive on the PC where the driver will be installed.

#### Extracting the installation files

The driver installation file is a zip file that contains all the programs and files needed to install the CTI USB driver. To extract the installation elements, click on the file to initiate the extraction process. When the extraction begins, you will be able to choose the folder that will contain the extracted files.

### Installing the USB driver

See the "Installation Instructions" file included with the extracted files to display information on installing and configuring the driver.

After installing the USB driver, connect a USB cable from the PC to the PLC. Now you can check what port number is assigned to the connection by doing the following.

Go to Control Panel – System – Hardware tab – Device Manager – select Ports (COM & LPT). Look at what COM # the CTI 2500 Series PLC is set to. In this case it is COM9.



Open PLC Workshop and click on FILE – OPEN Select CONNECT TO PLC – Select SETUP

Open P	rogram 🗙
Program	n File: Browse
Addre	ess Documentation
Path:	Advanced
Progra	am Type Sonnect to PLC Connection Method (COM1) Setup Use File Associated Connection Settings Options Transfer Logic to PLC Read all NOPs
	OK Cancel

Click the radio button for comm. ports - Select the port # - Click OK

Communications Setup								
Online Selection	n							
<b>7</b> •	Serial Ports	Port: COM1 💌						
*	Serial TIWAY							
C C	TCP/IP							
	FMS							
•••• •	H1							
	OK Can	cel						



Verify your settings and click OK

Open Program 🔀
Program File: Browse
-Address Documentation
Path: Advanced
Program Type  C Offline  Connect to PLC  Connection Method  (COM9) Setup  Use File Associated Connection Settings
Options
Transfer Logic to PLC
F Read all NOPs
OK Cancel

You should now be online with the PLC.

# **Connecting to the Ethernet Port**

The CTI 2500 controller provides a means to attach the controller to a plant network via an integrated 10/100Mb Ethernet port. The port offers auto-crossover capability, which allows you to connect a standard cable directly from your PC to the Ethernet port for local programming.

The port uses the TCP/IP protocol, which is widely supported by programming software and HMI software. Before you can use the port, you must set the IP address and related parameters. To do this, you can use Workshop Version 4.11 or greater or the CTI standalone utility program IPSET. You may obtain IPSET by downloading it from the CTI web site (http://www.controltechnology.com/downloads/)

Setting the IP Address with Workshop Connect to the PLC via the RS232 port or the USB port Make sure that the PLC is in **PROGRAM Mode** Select the PLC Utilities menu then Configure TCP/IP Address



Enter the IP Address, Subnet Mask and Router Address you want the PLC to have and click Accept

2500 TCP/IP Configuration	
Local Ethernet Port: 0	Read Port Address
2500 Internet Protocol Address	Programming Port:
199 . 184 . 177 . 224	4452
2500 Net Mask 255 . 255 . 255 . 0	HMI Ports: 4450 1505
2500 Router Address	Web Server Port:
0.0.0.0	80
Accept OK	Cancel

The 7 segment display on the front of the PLC should be cycling through the IP Address.

#### Setting the IP Address with IPSET

Connect to the PLC via the RS232 port or the USB port Open the IPSET Program Select the COM # you want to connect with and click Connect

CTI - Set Ethernet Parameters Utility					
Select a serial port					
COM9 🚍 Connect					
2500 Ethernet Port Parameters					
IP Address					
Subnet Mask					
Gateway Address					
Update					
Selected port COM9	_				

Enter the IP Address, Subnet Mask and Router Address you want the PLC to have and click Update

Select a serial port	Select a serial port									
СОМЭ 🚍	COM9 🚔 Connect									
2500 Ethernet Po	ort Param	eters								
IP Add	ress [	199		184		177		224		
Subnet M	1ask	255		255		255		0		
Gateway Add	lress [	0		þ		0		0		
Update										
Connected at 115200 br	e Modifi	uthe Eth	orne	toara	nete	are and	Lolic	k ''Uoda	ha <sup>ll</sup>	

The 7 segment display on the front of the PLC should be cycling through the IP Address.

Now that the PLC has the IP address you want it's time to connect to the Ethernet port with Workshop. Open PLC Workshop and click on FILE – OPEN Select CONNECT TO PLC – Select SETUP

Open Program
Program File: Browse
- Address Documentation-
Path: Advanced
- Options
Transfer Logic to PLC
🗖 Read all NOPs
OK Cancel

Click the radio button beside TCP/IP and then click the TCP/IP button

Communicat	ons Setup	×
Online Selec	ion	1
<b>7</b>	Serial Ports Port:	
	Serial TIWAY	
	TCP/IP	
	FMS	
	H1	
	OK Cancel	
_		

This is the TCP/IP Setup Window. Change TCP PORT to 4452 and click Accept. Click on Add... (NOTE: You can see that there are already some IP addresses in my setup. If you have previously setup your IP address it will already be in this list.)

т	CP/IP Setup		X
	Communication Settings TCP Port: Response Time Out (sec): Retries: Use CAMP: Use Packed Opcodes:	6 3 Yes • Yes •	Accept Cancel
	Path Description: IP224 IP225 IP205 IP206 IP208 IP208 IP27 (FREDS) ip218		IP Address: 199.184.177.222 199.184.177.225 199.184.177.205 199.184.177.205 199.184.177.205 199.184.177.278 199.184.177.218
	Add Modify	Delete	Close

Enter the IP address and the path description and Click OK. The Path Description is just a text field used as a device identifier.

TCP/IP Path	
IP Address:	OK
Path Description:	Cancel
IP224	

Select Close on the TCP Setup window Select OK on the Communications Setup Window Verify your settings and click OK

Open Program 🛛 🗙					
Program File: Browse					
Address Documentation					
Path: Advanced					
Patr: Advanced Program Type					
OK Cancel					

This window is where you select what address to connect to

TCP/IP Network Access					
Path Description:					
IP222 IP205 IP206 IP228 IP37 (FREDS) ip218					
OK Cancel	Setup				

Select the device you want to connect to and click OK You should now be online with the PLC.