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CommLink IV Technical Guide



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CommLink IV Overview

The CommLink IV is used to transfer communications between controllers on your control system loops. It can also be used as an interface for connection of a computer to your system.

The CommLink IV provides communication with the control system through any computer that is running Prism software. For remote communications, an IP Module Kit can be installed for LAN and Internet connections or a Remote Link II can be connected for dial-up connections.

Optional IP Module Kit

The OE415-02 IP Module Kit, when installed and configured in the CommLink IV communication interface, provides TCP/IP Internet and/or intranet connection for Ethernet networked computer systems allowing them to communicate with your control system. The OE415-02 IP Module Kit consists of the IP Module and a 10 ft. long CAT5 Ethernet crossover cable.

Using standard TCP/IP Protocol, with WattMaster's Prism software, you are able to monitor and configure your controllers without a modem or a direct connection from a PC. Utilizing existing routers, proxies, or firewalls allows a PC running Prism to connect to a controller in a remote accessible location or building. Several IP connection profiles can be created to facilitate monitoring several CommLink IVs with IP Module Kits installed on individual sites.

Optional Remote Link II

The OE419-06 Remote Link II is a 14,400 baud modem that can be used with a CommLink IV or a computer. It is used to provide remote dial-up communications with the CommLink IV. When it is used as a computer modem (at the remote computer location), it connects to the remote computer.

NOTE: WattMaster will not support any other internal or external modems by other manufacturers.

The Remote Link connects to the CommLink IV communications interface at the control system location via a DB9 serial cable. A telephone line connects the Remote Link to the local phone service. Using another Remote Link modem connected to a computer and phone service at a remote location, you can monitor and control the system using the Prism computer front end software. Connection is made by dialing the telephone number of the job site where the Remote Link is located.

Installing CommLink IV ONLY

When you are using the CommLink IV in an application without a computer, Remote Link II, or IP Module, follow Steps 1 & 2 in the Quick Guide on page 4.

System Requirements

To program the CommLink IV to work with Prism, you will need:

Standard Items (Required)

- CommLink IV with USB cable and power adapter
- A PC with an Ethernet communications port or USB port (supplied by others)
- USB drivers on CD-ROM (supplied and also downloadable from any of our websites)
- Microsoft Windows® XP, Vista or 7 (must be installed on the PC you are going to use)
- Prism software (can be downloaded from any of our websites)

Optional Items

- CommLink IP Module that comes with Ethernet RJ-45 Crossover CAT 5, 10 ft. long cable for LAN, and Internet remote communications
- Remote Link II that comes with connection cables for dial up remote communications

Quick Guide

Quick Guide

Follow the five steps below to get your CommLink up and running in no time.

NOTE: If you are using the CommLink IV without utilizing Prism, you need only perform Steps 1 & 2.

Step 1: Set your CommLink's communication switch to Multiple or Single. *See Figure 2 on page 6.*

Step 2: Wire your CommLink to the appropriate controller on your system, and plug the CommLink into a power supply. *See Figure 1 on page 5.*

Step 3: Windows XP users, attach one end of the USB cable to the back of your CommLink and the other end into your computer's USB port. Then follow the instructions that appear on your screen to install the USB drivers located on the included CD-ROM.

Windows Vista and 7 users, install the USB drivers located on the included CD-ROM. Then attach one end of the USB cable to the back of your CommLink and the other end into your computer's USB port.

Step 4: Install Prism software on your computer.

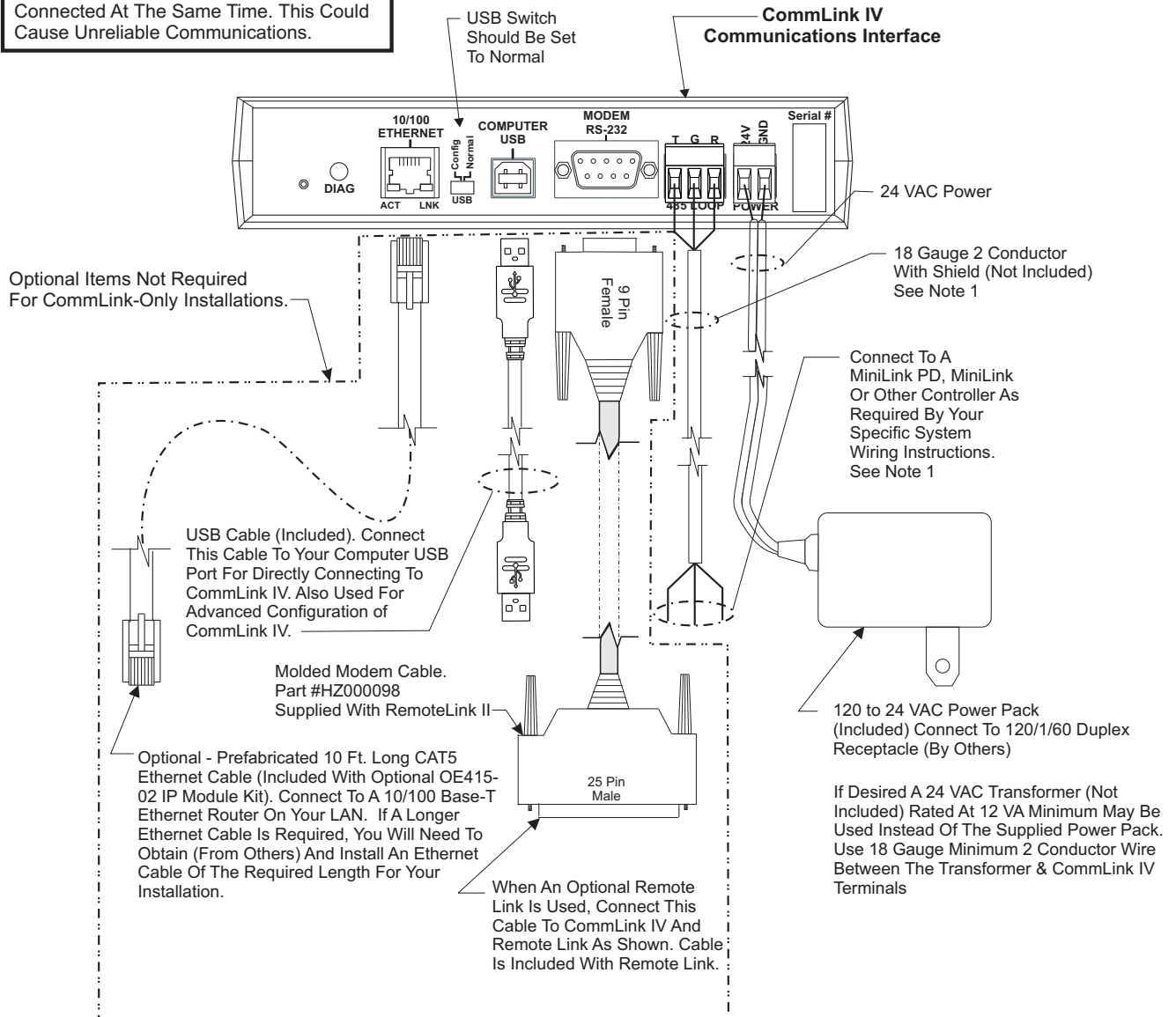
NOTE: For remote communications, follow the instructions included in your *IP Module Technical Guide* or *Remote Link II Technical Guide*.

IMPORTANT NOTES:

- Make sure you follow the appropriate directions for your Windows version - Windows XP directions are different from Windows Vista & 7.
- For Windows XP, first plug in your CommLink device, then follow the instructions to install the USB drivers. For Windows Vista or 7, first install the USB drivers, then follow the included CommLink IV connection and wiring instructions sheet (Figure 1 on page 5) to connect and configure the CommLink IV.
- Make sure you follow the appropriate directions for your Prism version - Prism directions are different from Prism II.
- Familiarize yourself with all system components and review all documentation. Pay special attention to "Cautions," "Notes," and "Warnings" since these may keep you from experiencing unnecessary problems.
- If you encounter any problems, please refer to the Troubleshooting section of this guide first. If you can't resolve the problem, please call WattMaster Technical Support at our toll free number—1-866-918-1100.

CommLink IV Connections & Wiring

WARNING! If You Are Using The IP Module With Your CommLink, Do Not Have Your Ethernet Connection And USB Connection Connected At The Same Time. This Could Cause Unreliable Communications.

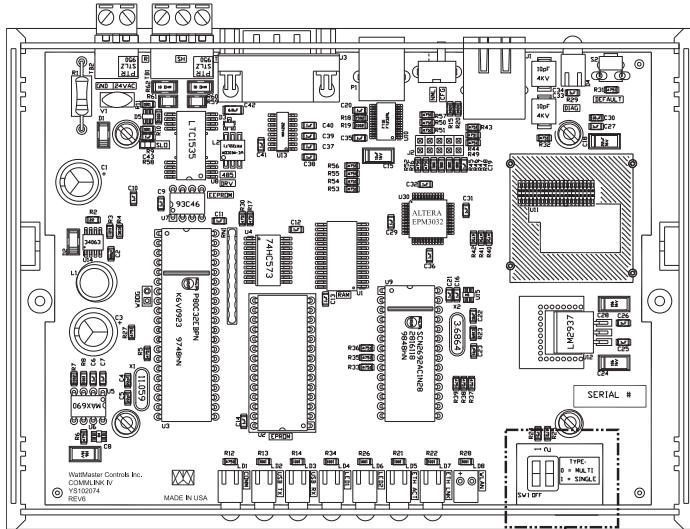


Notes:

- 1) Use 18 Gauge Minimum 2 Conductor Twisted Pair With Shield Cable Belden #82760 Or Equivalent (Not Included) To Connect The CommLink IV To A MiniLink or MiniLink PD.
- 2) For Direct Connection Via USB, Your Computer Must Have An Unused USB Port Available. Drivers For Your USB Port Are Provided On A CD Supplied With The CommLink IV. Please Follow The Directions In The CommLink IV USB Driver Installation Section (Included) To Install And Configure The USB Drivers.
- 3) The CommLink IV Cannot Communicate With The Control System Through Its Ethernet Port And USB Port At The Same Time.
- 4) All Wiring Must Conform To Applicable Federal, State & Local Electrical Wiring Codes.

Figure 1: CommLink IV Connection & Wiring

Checking And/Or Setting The CommLink IV SW1 Communications Dip Switch



CommLink IV Communication Settings

The SW1 DIP Switch Located On The Circuit Board Inside The CommLink IV Housing Must Be Set Correctly For Your Specific Application In Order To Function Properly. The CommLink IV Is Factory Set For Multiple Loop Applications.

To Check And/Or Set The SW1 Dip Switch, First Remove The (2) Enclosure Screws That Hold The Top And Bottom Of The CommLink IV Enclosure Together. Remove The Top Half Of The Enclosure To Access The Circuit Board And Dip Switches.

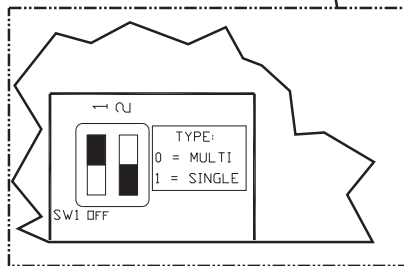
The SW1 DIP Switch Setting Should Be Set To “Multiple” In The Following Situation:

You Have A Single CommLink IV With MiniLink(s) or MiniLink PD(s) Installed On Your System.

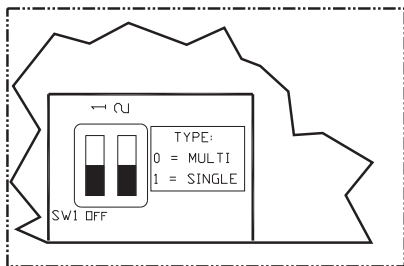
The SW1 DIP Switch Setting Should Be Set To “Single” In The Following Situation:

You Have A Single CommLink Without Any MiniLinks or MiniLink PDs Installed On Your System.

Replace The CommLink IV Cover And Secure The Enclosure Halves Back Together With The (2) Enclosure Screws That Were Previously Removed.



DIP Switch 1 On & 2 Off = Single Loop Communications



DIP Switch 1 & 2 Off = Multiple Loop Communications

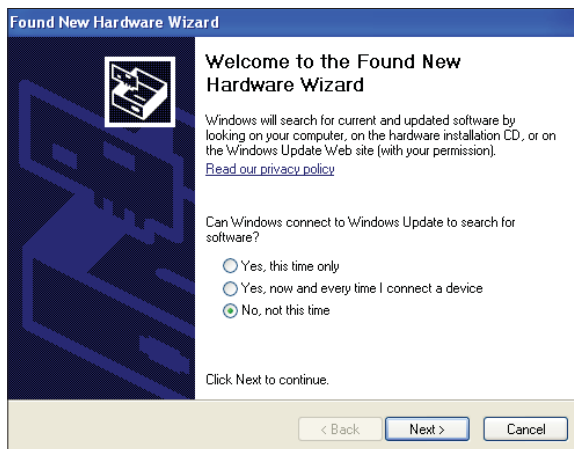
Figure 2: CommLink IV Communication Settings

USB Serial Converter Driver Installation for Windows® XP

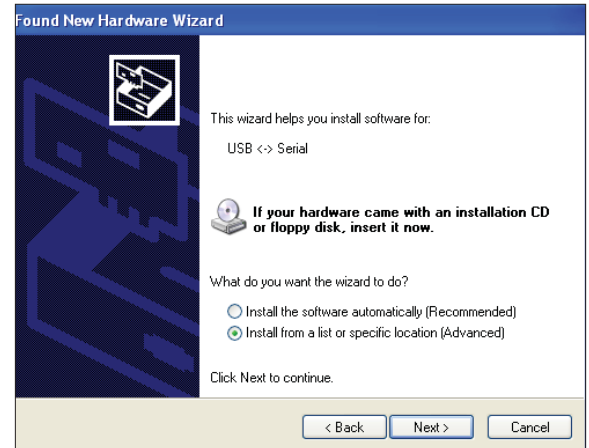
CAUTION: You must use the drivers on the CD-ROM supplied with the CommLink IV. DO NOT download drivers from the FTDI website, because they will not work for the CommLink IV Interface!

NOTE: If for any reason you cancel out of the New Hardware Wizard before installing the USB drivers or if you receive an error message during installation, the drivers will not be installed. You must then install the drivers using the directions in the XP Troubleshooting Section on page 17.

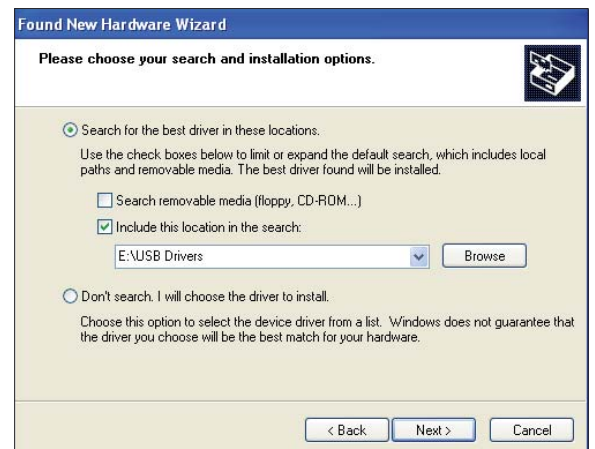
1. Plug the USB cable attached to your CommLink into your computer's USB port.
2. Insert the USB Drivers CD-ROM into your CD-ROM drive.
3. A message should pop up from the toolbar that reads, "Found New Hardware." Click on the Found New Hardware Wizard application from the toolbar.
4. The window that appears will ask the question, "Can Windows connect to Windows Update to search for software?" as shown below. Select "No, not this time" and click <Next>.



5. The next window that appears will ask, "What do you want the wizard to do?" Select "Install from a list or specific location (Advanced)" as shown below and click <Next>.



6. In the next window that appears, select the radio button in front of the option "Search for the best driver in these locations." Uncheck the box that reads, "Search removable media" and instead check the box "Include this location in the search:"



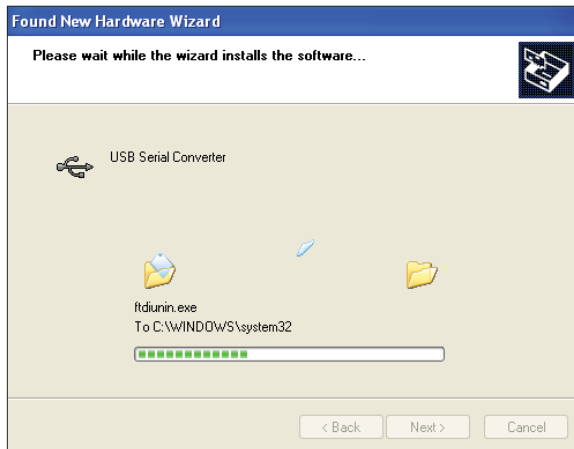
7. Click <Browse> and locate the drive that your CD-ROM is located on. Click <Next>.

USB Driver Installation for Windows® XP

- Highlight the Win98_Win_2000_Win98 directory by clicking on it and then click <OK>.



- The screen will now state, “Please wait while the wizard installs the software...”



- While the files are downloading, a *Hardware Installation* window might pop up as shown below. Click <Continue Anyway>.



- The wizard will then finish installing the software.
- Once the wizard is done, click <Finish>.

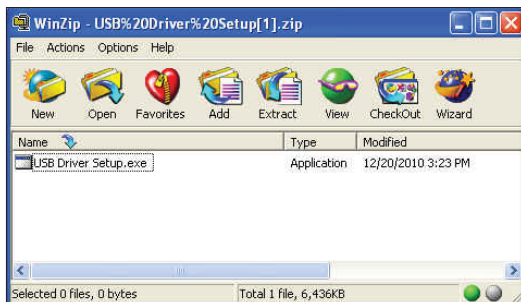
USB Serial Port Driver Installation for Windows® XP

- Once the USB Serial Converter software is installed, the Found New Hardware Wizard will appear again to download the USB Serial Port software.
- Follow steps 1 through 7 of the previously described USB Serial Converter Installation instructions.
- Click <Finish> when the wizard is done downloading the software.
- Windows® XP requires you to restart your computer before the new settings will take effect.
- Continue with the next section “Finding What COM Port Number the CommLink IV is Using” on page 10.

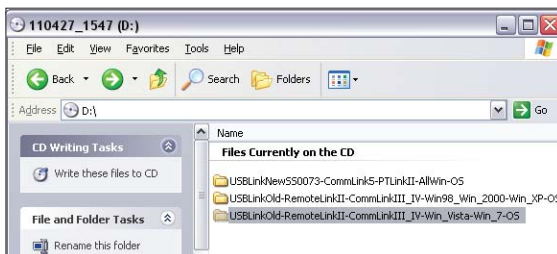
USB Driver Installation For Windows Vista & 7

USB Serial Converter and Serial Port Driver Installation for Windows Vista & 7

1. Insert the USB Drivers CD-ROM into your CD-ROM drive or *download* the USB Drivers file from www.orion-controls.com/software-new.html. If using the CD-ROM, go to Step 2. If downloading the file, *click* on the USB Driver Setup.zip file to unzip the file and then go to Step 3..



2. Double-click on the Vista/Win_7 folder.



Double-click on USB Driver Setup.exe.

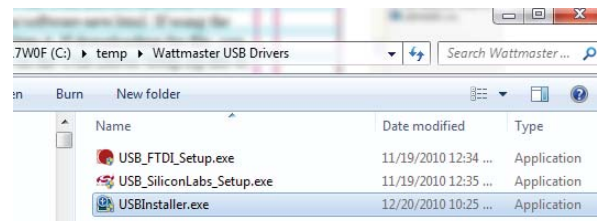


3. The *WattMaster USB Driver Installation Window* will appear.



4. If you wish to change the Destination Folder, *click* <Browse> and change the location. *Click* <Install> to install the software. Then, open the WattMaster USB Driver folder in the temp directory on your hard drive or the new location if you changed the destination folder.

5. Double-click USBInstaller.exe.



6. Then *click* the <Begin Install> button.



7. The installation program will walk you through the rest of the steps. The program might prompt you to remove old USB drivers from your computer. *Click* <Yes> if so. Once installation is complete, you will need to reboot your computer to have the new settings take effect.
8. With successful USB driver installation, you can now connect your USB device.
9. Follow the procedures on page 10 to verify the Comm Port.

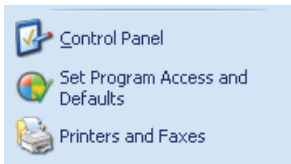
Finding the COM Port Number

Finding What COM Port Number the CommLink IV is Using

1. *Left-click* on <Start>, located on the bottom left of the Windows Tool Bar.



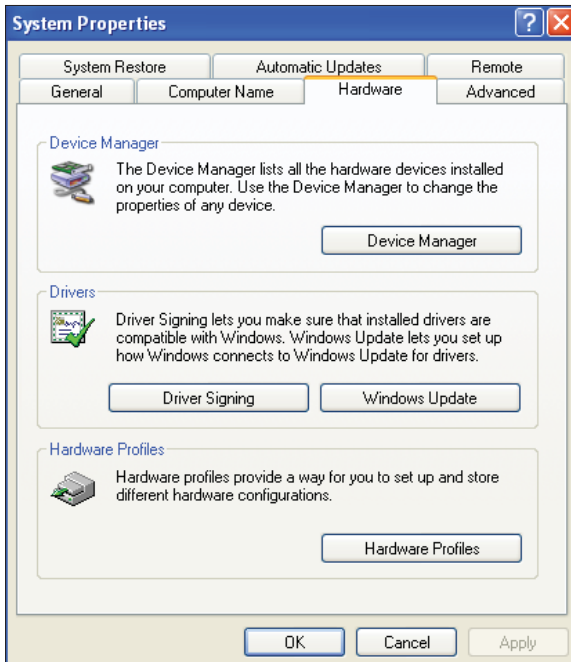
2. *Select* <Control Panel>.



3. *Double-click* the System Icon.

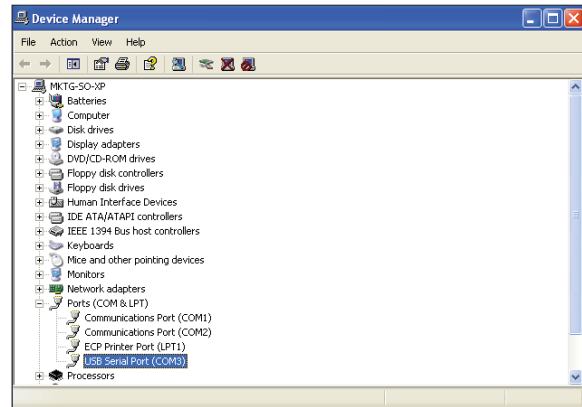


4. *Click* the <Hardware> tab.




5. *Click* the <Device Manager> button.

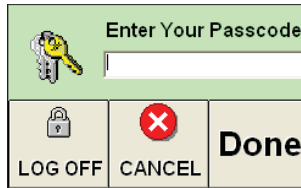
6. *Click* on the plus sign next to Ports to see all of the common ports.



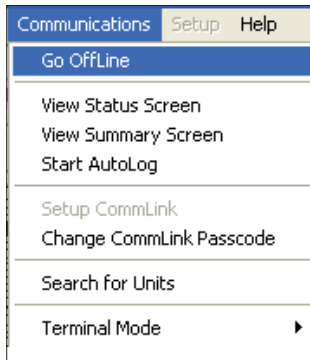
7. *Locate* the USB Serial Port (COM#). The COM# in parentheses is the port it is located on. *Write* this COM port number down. You will need to know this when setting up the Prism software.
8. If the COM port number is 10 or greater, go to “Changing the USB COM Port Number” in the Troubleshooting section on page 18; otherwise, continue with the section “Prism Setup” on page 11 or “Prism II Setup” on page 12.


Prism Setup

1. Open your Prism software.
2.  Click on the <Key> button and type in your level 3 passcode (default "sm"). Click <Done>.



3. If Prism is online, click <Communications> and then click <Go Offline>.

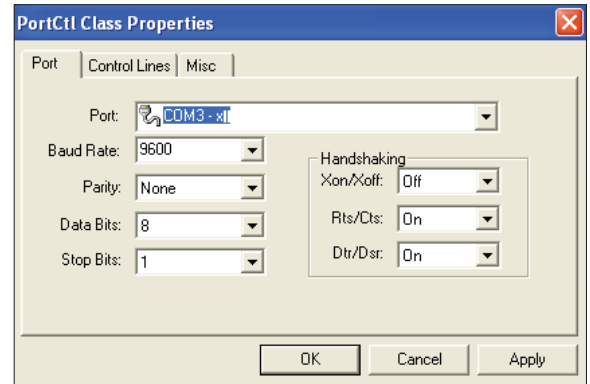


4.  Click on the <Edit Jobsite> button to enter jobsite information.

5. Click on an empty location. Type in a job name and press <Enter>.

Location	Port	BaudRate	IP Address	CommLink	Phone No
1 New Job Site	1	9600		0	
2		9600		0	
3		9600		0	
4		9600		0	
5		9600		0	
6		9600		0	
7		9600		0	
8		9600		0	
9		9600		0	

6. Double-click in the Port location on the same line as the job name. The *PortCtl Class Properties Window* will pop up.



7. Click on the down arrow on the Port pull down box and select the COM port number that the CommLink IV is using. Click <Apply> and then click <OK>.

8. In the *Job Site Window's* Baud Rate field, type in the baud rate 19200 and press <Enter>.

Location	Port	BaudRate
1 New Job Site	1	19200

9. If you are using a single loop CommLink, type a "1" in the CommLink field in the *Job Site Window* and press <Enter>. For all other configurations, leave "0" in the field.

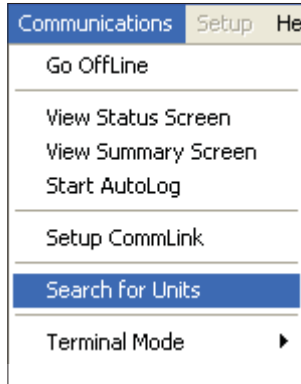
Location	Port	BaudRate	IP Address	CommLink
1 New Job Site	1	19200		1

10. Click <Done>.

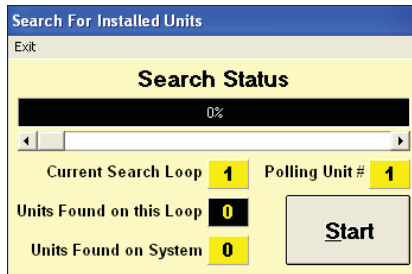
11. Click <Communications> again and select <Go On-Line>.

Prism II Setup Instructions

- Click <Communications> again and select <Search for Units>.




- The Search for Installed Units Window will pop up. Click <Start> to start the search.




- If everything is working correctly, **Units Found on this Loop** should increment.
- If **Units Found on this Loop** stays at zero, check the wiring to the CommLink IV and the AHU/RTU Controllers and/or read through these directions again to make sure all steps were followed.

Prism II Setup

- Open your Prism II software.

-  Click on the <Login> button and type in your level 3 passcode (default "9288"). Click <OK>.



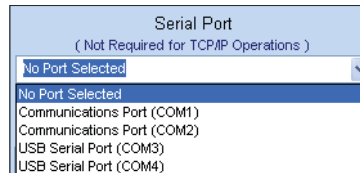
-  If Prism II is online, click the <ON LINE> button to make it go <OFFLINE>.

-  Click the <Job-Site> button to open the Job Sites Window.

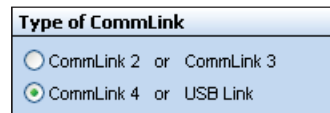
- Click on any empty location in the Job-Site Selection Window and then type in a job name in the Selected Location box and press <Enter>.



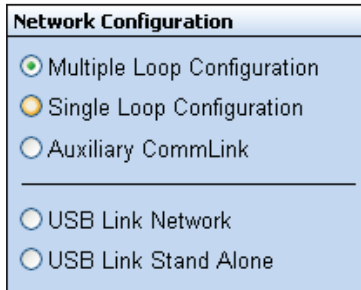
- In the Serial Port field, click on the pull down box and select the COM Port number that the CommLink IV is using.




- In the Type of CommLink selection box, select the radio button next to CommLink 4.



- In the Network Configuration selection box, select the type of CommLink you are using. This will be either Multiple Loop Configuration or Single Loop Configuration.

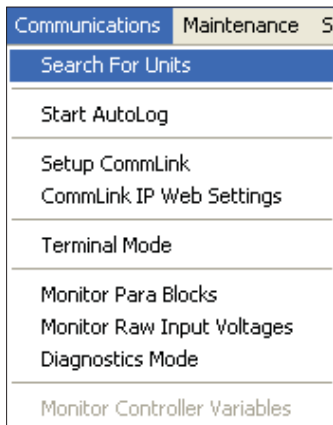


- Click <Exit> to close out of the *Job Sites Window*.

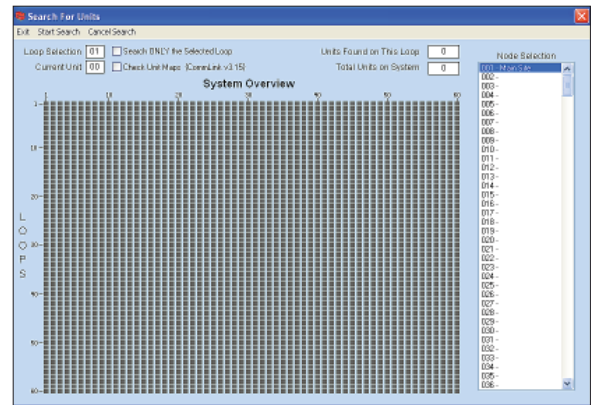
- 
 Click the <OFFLINE> button to go <ON LINE>.

- From the <Communications> menu, select <Search for Units>.

- The *Search for Installed Units Window* will pop up. Click <Start Search> to initiate an automatic detection of all installed controllers on your system.



- If everything is working correctly, **Units Found on this Loop** should increment.



- If **Units Found on this Loop** stays at zero, check the wiring to the CommLink IV and the AHU/RTU Controllers and/or read through these directions again to make sure all steps were followed.

CommLink IV LED Descriptions

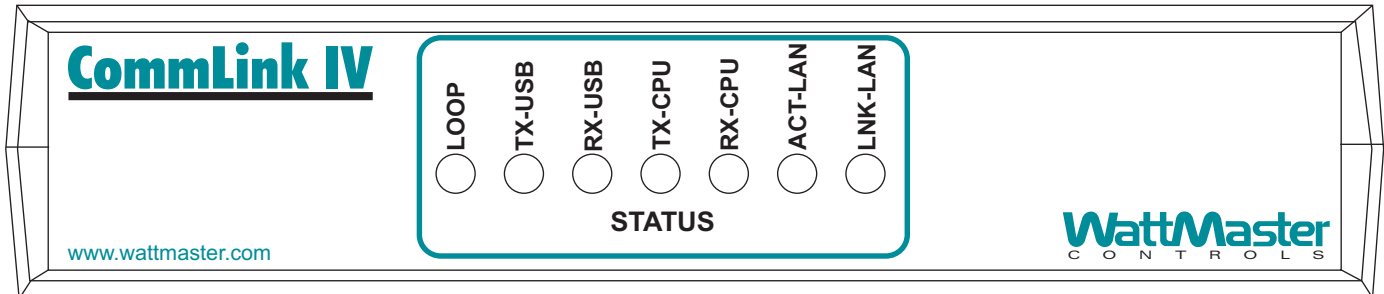


Figure 3: CommLink IV LED Display

CommLink IV LED Descriptions

LOOP - Indicates communication activity on local controller network. This LED flickers when data is exchanged with the controller network.

TX-USB - Indicates transmitted data status of USB connection. This LED only flashes when your CommLink is connected to a computer and data is sent to Prism from the CommLink via USB.

RX-USB - Indicates received data status of USB connection. This LED only flashes when your CommLink is connected to a computer and data is sent from Prism to the CommLink via USB.

TX-CPU - Indicates transmitted data status. This LED only flashes when your CommLink is connected to a computer and data is sent to Prism from the CommLink using USB or Ethernet.

RX-CPU - Indicates received data status. This LED only flashes when your CommLink is connected to a computer and data is sent from Prism to the CommLink using USB or Ethernet.

ACT-LAN - Indicates activity on the local area network. This LED flashes on when LAN is transmitting and receiving data and is only operational when the IP Module Kit is installed.

LNK-LAN - Indicates local area network is connected. This LED is on when connected to LAN and is only operational when the IP Module Kit is installed.

Proxy and Firewall Compatibility

Proxy and Firewall configurations may become necessary when the CommLink IV is connected to a LAN/WAN that is protected by a commercially available Firewall, Proxy, or NAT enabled router. Examples of these would include Cisco, NetGear, LinkSys, or WatchGuard Technologies. Also, some ISPs provide IP Address ranges that are already fire-walled at the NOC or ISP Head-End. Make sure that your IT Department or ISP can create a mapped TCP port 39288 on your firewall/proxy to TCP port 39288 on the assigned IP Address of the CommLink IV.

Only with proper configuration of the Firewall/Proxy are connections to the CommLink IV from outside of the local area network going to be possible. Check that the Firewall/Proxy port is not set to time out or reset after a specified amount of time when there is no traffic from the remote PC.

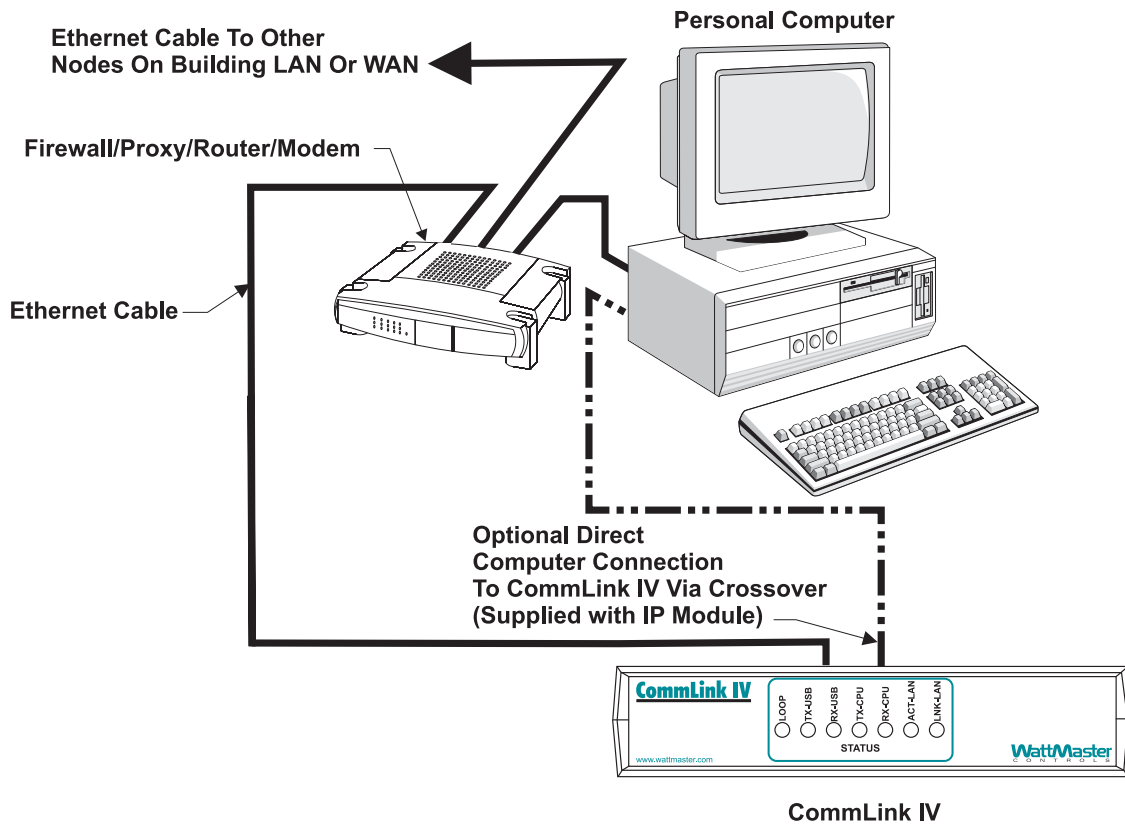


Figure 4: Example Network Diagram of a Firewall or Proxy Configuration

Troubleshooting the USB Drivers

Troubleshooting Tips

Problems with Prism Software

- Verify that the correct COM port, created by the USB connection, is selected in the *Job Site Window*. Verify COM port number in <Control Panel>, <System>, <Hardware>, <Device Managers>, <Ports>.
- If using Prism II, verify that CommLink 4 is selected for Type of CommLink in the *Job Sites Window*.
- If using Prism, verify that the Baud Rate is set to 19200 in the *Job Sites Window*.
- Verify that the correct CommLink mode is selected under Network Configuration in the *Job Sites Window*.
- Verify that the USB switch on the back of the CommLink is set to Normal.

Problems with USB Connection

- Verify that the RX-USB and TX-USB are blinking when you perform a Search for Units or try to open a status screen in Prism.
- If the USB LEDs fail to blink, disconnect and reconnect the USB connection.
- If the problem persists, verify that the USB drivers have been installed properly.

Problems Viewing Controllers on a Network

- Make sure that the CommLink communication dip switch is set to Multi.
- Make sure that in Prism, the CommLink field in the *Job Sites Window* is set to zero for multiple loop.
- In Prism II, make sure that Multiple Loop Configuration is selected for Network Configuration in the *Job Sites Window*.

NOTE: WattMaster Controls Technical Support cannot troubleshoot internal PC and/or Windows-based operating system problems.

NOTE: WattMaster Controls Technical Support cannot troubleshoot firewalls, routers and/or problems on a customer's internal or external network. An IT professional may need to be consulted.

Troubleshooting the USB Drivers for Windows® XP

Troubleshooting the USB Drivers for Windows® XP

If the *Found New Hardware Window* did not appear when you plugged in your CommLink or if you canceled out of the installation procedure for any reason, you will have to follow these instructions to install the USB drivers.

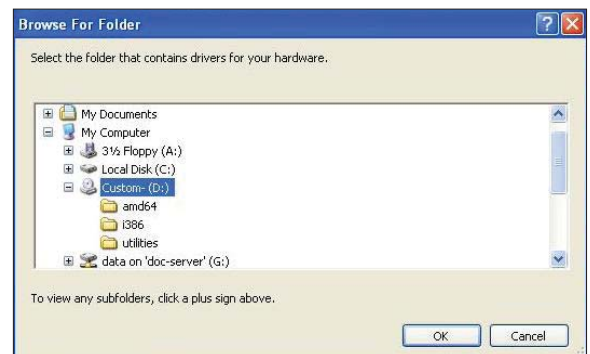
1. Plug the USB cable attached to your CommLink into your computer's USB port.
2. Click <Start>, click <Control Panel>, and then double-click <System>. The *System Properties Window* will appear. Click the <Hardware> tab and then click <Device Manager>.



3. The *Device Manager Window* will appear. In this window, look for an exclamation point in the categories, "Other devices," "Ports," or "Universal Serial Bus controllers." Click the item containing the exclamation point.



4. Right-click on USB Serial Port and then click <Update Driver>. The *Hardware Update Window* will appear.
5. In response to the question, "Can Windows search for software?" click the radio button, "No, not at this time" and then click <Next>. Insert your USB Drivers CD-ROM into your CD-ROM drive. And then click the radio button, "Install from a list or specific location" and click <Next>.
6. The screen will now display the message, "Search for driver software in this location:" If the location is correct, click <Next> and go to step 8. If not, click <Browse>.
7. Select the CD-ROM location from the list of folders and then click <OK>.



8. A message will appear that states, "Please wait while the wizard installs the software..."
9. When the installation is complete, the window below will appear. Click <Finish>.

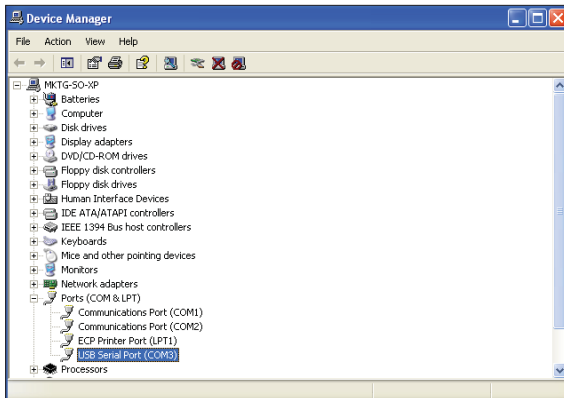


Troubleshooting the COM Port Number

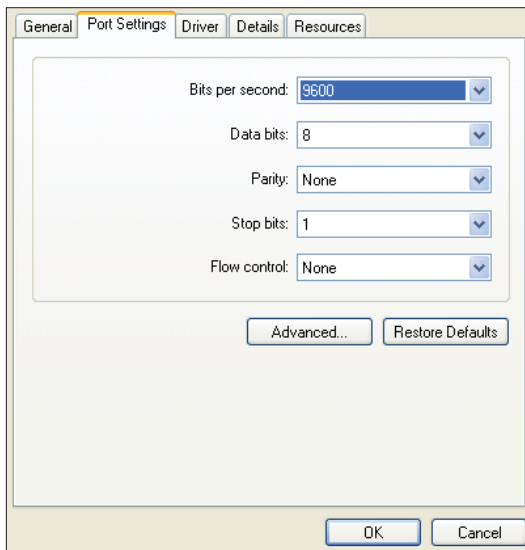
Changing the USB COM Port Number

When the CommLink is first plugged in, it will be assigned a COM port number to be used for communicating with the Prism software. If the port number is 10 or greater, it needs to be changed to a value less than 10 to be recognized by Prism.

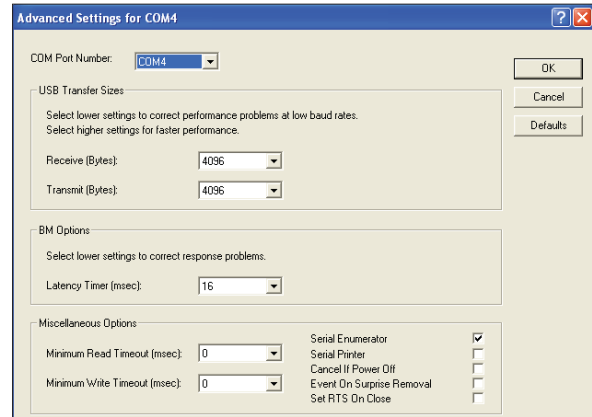
1. Click <Start>, click <Control Panel>, click <System>, click the <Hardware> tab, and then click <Device Manager> to get to the *Device Manager Window*.
2. Click on the plus sign next to Ports to see all of the COM ports.



3. Right-click on “USB Serial Port (COM#)” and select <Properties>. In the *Properties Window*, select the <Port Settings> tab.



4. To assign a port number less than 10, click on <Advanced>. The *Advanced Settings Window* will appear.



5. In the COM Port Number drop box, select which COM port you wish to use. Make sure you select a COM port number that is not currently in use (you can see the ports in use in the *Device Manager Window*). Select a port that is less than 10.

NOTE: Windows® will assign a port number to every device that has ever been installed on your computer. So if there are no available ports below 10, choose a port number less than 10 for a device listed that you know you are not currently using.

6. Once you select the correct COM port number, click <OK> and close any windows opened in the process of changing the port number. Make note of this number because you will need it for your Prism setup.



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