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IP Module Technical Guide



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IP Module Overview

The OE415-02 IP Module installs into the CommLink IV or 5 Communications Interface and provides a TCP/IP Port connection from the WattMaster control system to a building's Ethernet LAN, providing communications with the control system through any computer (with Prism II software installed) connected to the LAN or the Internet (if configured for access through your LAN's Internet firewall).

Using standard TCP/IP Protocol, with WattMaster's Prism II 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 II to connect to a controller in a remote accessible location or building. Several IP connection profiles can be created to facilitate monitoring several sites.

System Overview

The IP Module is a stand-alone network appliance that connects to a 10BaseT or 10/100 network connection. The IP Module will require an IP address on the local network or a routable IP address provided by an ADSL or cable modem if it is to be accessed through the Internet. The PC will require a dialup or Ethernet network connection to the Internet or local network with routes to the CommLink. Check with your local IT Department in regards to your network routing needs.

The TCP/IP connection itself is a TCP connection made on a single port number and is static in nature. Firewall and proxy servers can be configured to allow traffic to and from this device. The nature of the data is raw in form and comprised of packets native to Prism II software. The CommLink will respond to ICMP traffic (PING) for verification of proper configuration, but Prism II software is required in order to send and receive data to the CommLink.

System Requirements

To program the IP Module to work with Prism II, you will need:

- CommLink IV or CommLink 5 with power adapter
- IP Module
- Prism II software (can be downloaded from any of our websites).
- A PC with an Ethernet communications port (supplied by others)
- Ethernet RJ-45 Crossover CAT 5, 10 ft. long cable (supplied with the IP Module) and an available network port to connect the CommLink to your computer
- Microsoft Windows® XP, Vista, or 7 (must be installed on the PC you are going to use)
- An IP Address, Subnet Mask, and Gateway Address for the CommLink's IP Module. Ask your Network Administrator for this information.
- COMMLINK 5 ONLY - Baud rate of the control system that your CommLink 5 is connected to. See *Figure 4 on page 8* for further explanation.

Quick Guide

Quick Guide

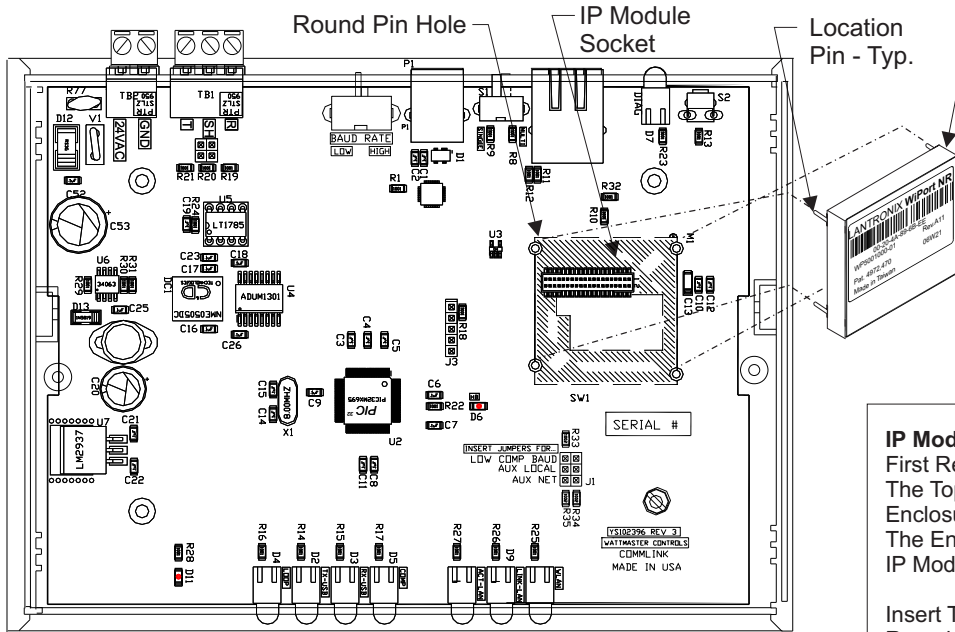
Follow the five steps below to get your IP Module up and running in no time.

- Step 1: Open your CommLink and snap in your IP Module. *See Figure 1 on page 5.*
- Step 2: Set your CommLink's communication switch to Multiple or Single. *See Figure 2 on page 6 for CommLink IV directions and Figure 3 on page 7 for CommLink 5 directions.*
- Step 3: Set your CommLink 5's Baud Rate switch to High or Low. *See Figure 4 on page 8.*
- Step 4: Wire your CommLink to the appropriate controller on your system and plug the CommLink into a power supply. *See Figure 5 on page 9 for CommLink IV directions and Figure 6 on page 10 for CommLink 5 directions.*
- Step 5: Connect your CommLink to your PC via Ethernet cable. *See Figures 7 and 8 on page 11.*
- Step 6: Change your PC's IP address. *See Figure 12 on page 12.*

IMPORTANT NOTES:

- Follow the included CommLink connection and wiring instructions sheet (*See Figure 5 on page 9 or Figure 6 on page 10*) to connect and configure the CommLink for an Ethernet connection.
- Make sure you follow the appropriate directions for your Windows® version .
- 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.

**Installing OE415-02 IP Module to CommLink IV
(CommLink 5 Shown)**



IP Module (Part Of OE415-02 IP Module Kit). Used When TCP/IP LAN Or Internet Communications With The Control System Is Desired.

IP Module Installation Instructions:
First Remove The Enclosure Screws That Hold The Top And Bottom Of The CommLink Enclosure Together. Remove The Top Half Of The Enclosure To Access The Circuit Board And IP Module Socket.

Insert The IP Module's Guide Pins Into The Round Pin Holes On The CommLink Circuit Board As Shown. When The Pins Are Properly Aligned, Press Down On The IP Module Firmly To Seat It Into Its Socket.

While The Top of the Enclosure Is Removed, Make Sure That The SW1 DIP Switch Is Set Correctly. (CommLink IV Only.) See Figure 2.

After Making Sure The IP Module Is Firmly Seated, Replace The CommLink Cover And Secure The Enclosure Halves Back Together With The Enclosure Screws That Were Previously Removed.

Follow The Instructions In This Guide For Installing The IP Module Software And Configuring The IP Module For Your Control System.

**CommLink with OE415-02 IP Module Installed
(CommLink 5 Shown)**

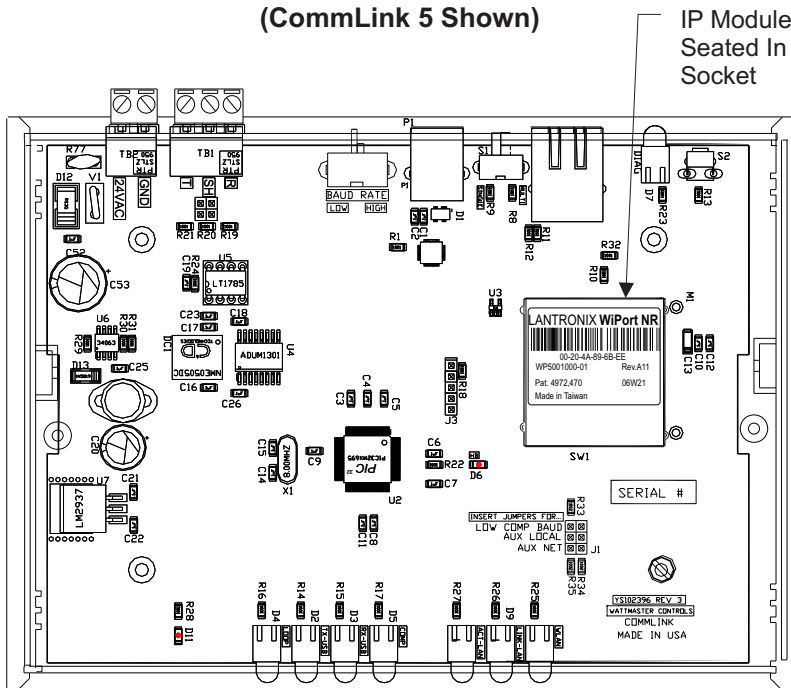
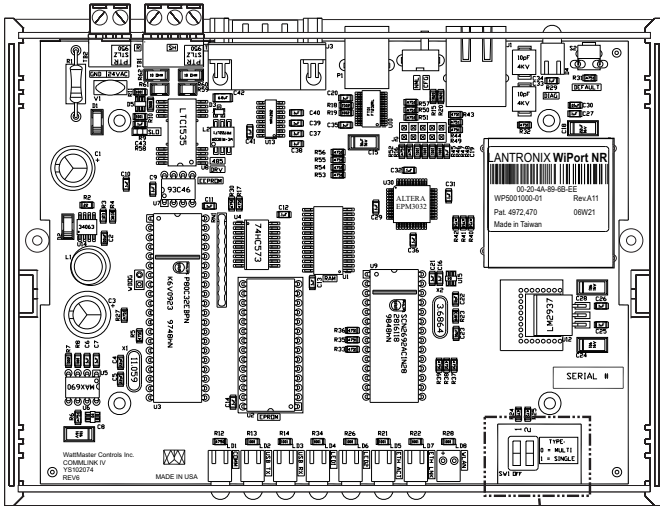


Figure 1: Installing the IP Module

CommLink IV Communications Settings

Setting the CommLink IV Communications Setting



CommLink IV Communications Setting

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.

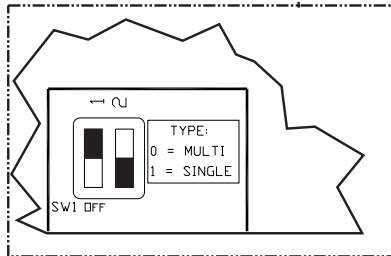
The SW1 DIP Switch Setting Must Be Set To "Multiple" In The Following Situation:

When There Is A MiniLink Wired To Your System.

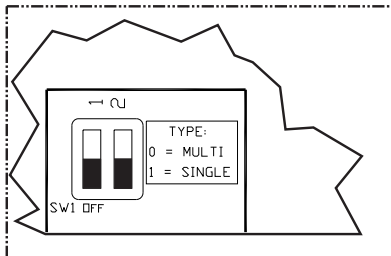
The SW1 DIP Switch Setting Must Be Set To "Single" In The Following Situation:

When There IS NO MiniLink Wired To Your System.

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



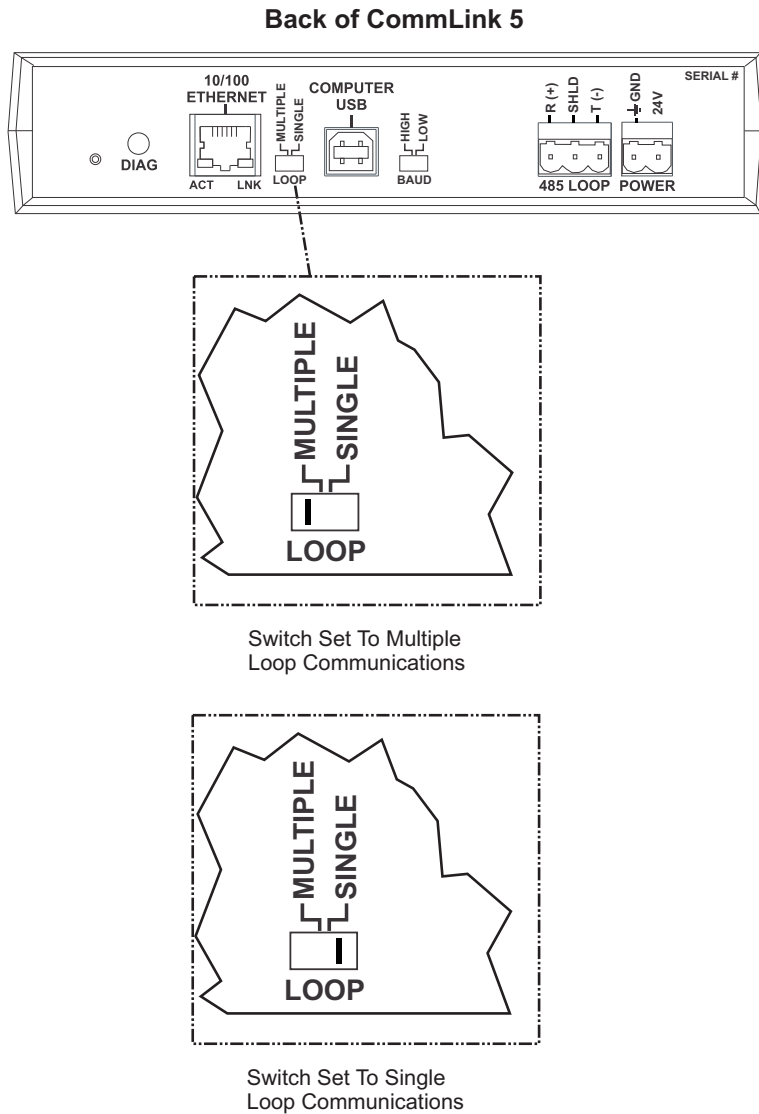
DIP Switch 1 On & 2 Off =
Single Loop Communications



DIP Switch 1 & 2 Off =
Multiple Loop Communications

Figure 2: CommLink IV Communication Settings

CommLink 5 Loop Communications Setting

Setting the CommLink 5 Loop Communications Switch**CommLink 5 Communications Setting**

The Loop Switch Located On The Back Of The CommLink 5 Housing Must Be Set Correctly For Your Specific Application In Order For The CommLink 5 To Function Properly. The CommLink 5 Is Factory Set For Multiple Loop Applications.

The Loop Switch Setting Should Be Set To "Multiple" In The Following Situation:

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

The Loop Switch Setting Should Be Set To "Single" In The Following Situation:

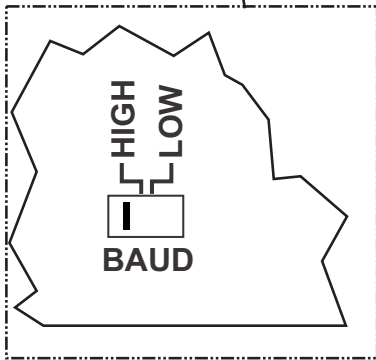
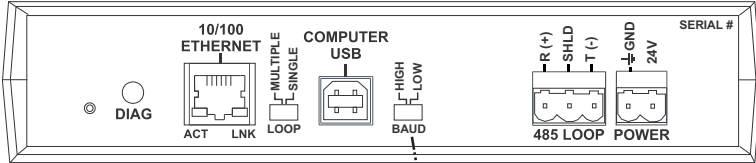
You Have A Single CommLink Without Any MiniLinks or MiniLink PDs Installed On Your System.

Figure 3: Setting Loop Communications

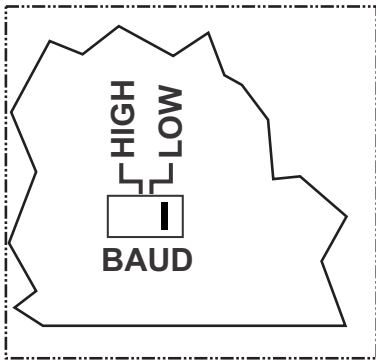
CommLink 5 Baud Rate Setting

Setting the CommLink 5 Baud Rate

Back of CommLink 5



Switch Set To High Baud Rate (115,200)



Switch Set To Low Baud Rate (Anything Less Than 115,200)

CommLink 5 Baud Rate Setting

The Baud Rate Switch Located On The Back Of The CommLink 5 Housing Must Be Set Correctly For Your Specific Application In Order For The CommLink 5 To Function At Maximum Efficiency. The CommLink 5 Is Factory Set For Low Baud Rate Applications.

The Baud Rate Should Be Set To “High” In The Following Situation:

- You are using AZ2 Controllers on your system.

The Baud Rate Should Be Set To “Low” In The Following Situation:

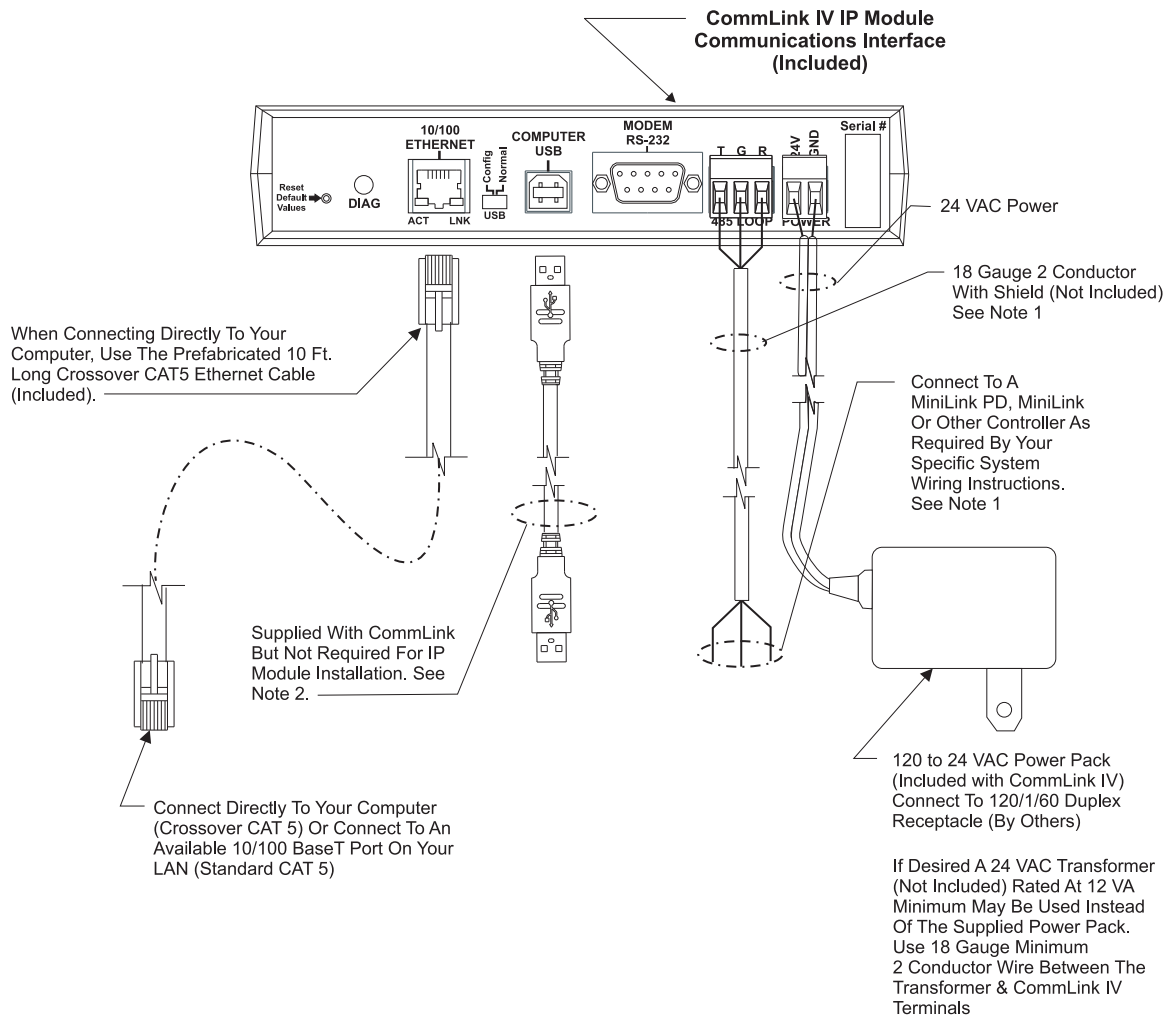
- You are using Orion Controllers on your system.

Figure 4: Setting the Baud Rate

CommLink IV with IP Module Connections and Wiring

CommLink IV with IP Module Connection & Wiring

WARNING! Do Not Have Your Ethernet Connection And USB Connection Connected At The Same Time. This Could Cause Unreliable Communications.



NOTES:

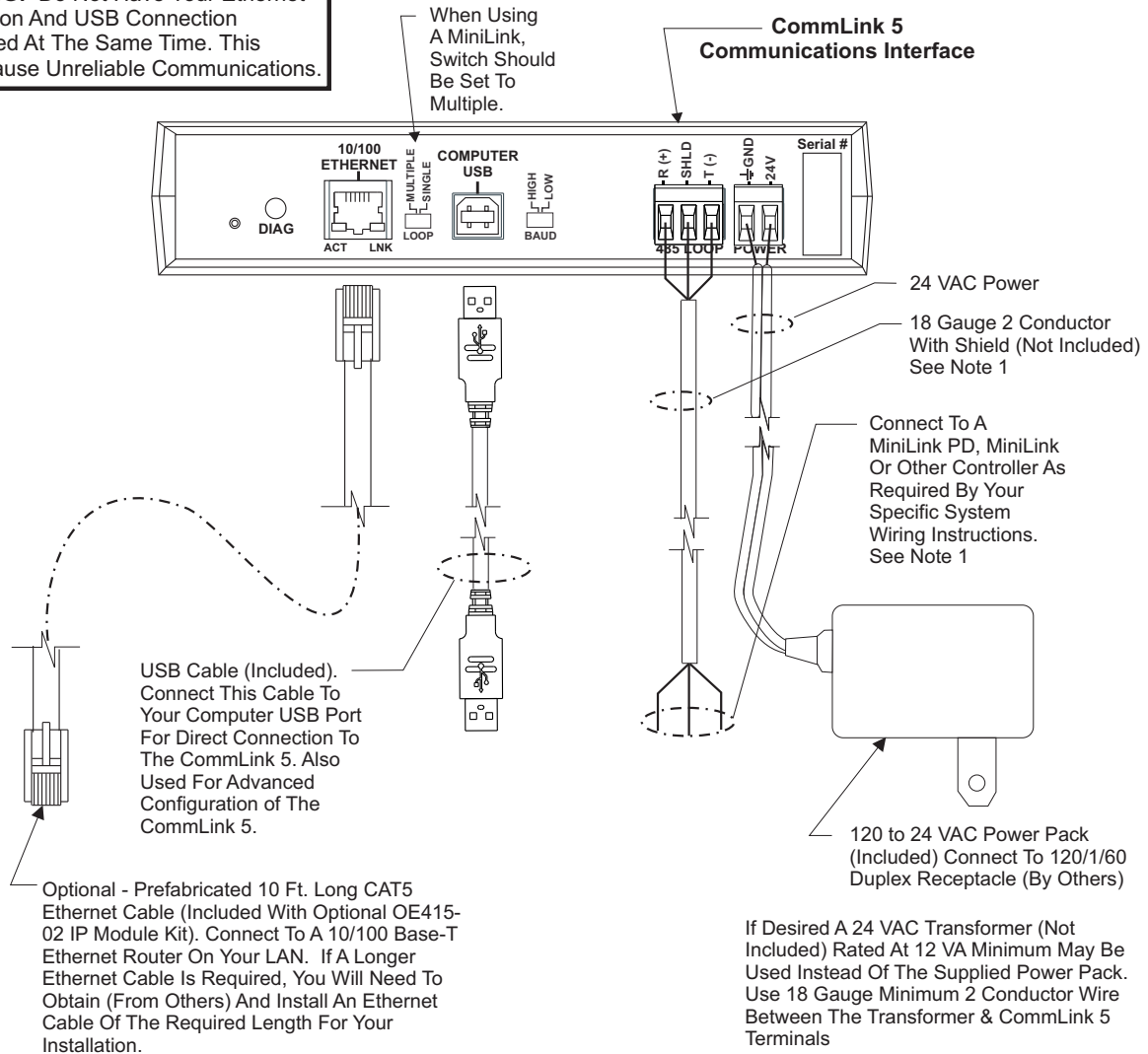
- 1.) Use 18 Gauge Minimum 2 Conductor Twisted Pair With Shield Cable Belden #82760 (Not Included) Or Equivalent To Connect The CommLink IV To A MiniLink or MiniLink PD On The Network Loop Or To Controllers On A Local Loop.
- 2.) The CommLink IV Cannot Communicate With The Control System Through Its Ethernet Port And USB Port At The Same Time.
- 3.) All Wiring Must Conform To Applicable Federal, State & Local Electrical Wiring Codes.

Figure 5: CommLink IV with IP Module Connection & Wiring

CommLink 5 with IP Module Connections and Wiring

CommLink 5 with IP Module Connections & Wiring

WARNING! 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 5 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 5. Please Follow The Directions In The CommLink 5 USB Driver Installation Section (Included) To Install And Configure The USB Drivers.
 - 3) The CommLink 5 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 6: CommLink 5 Connection & Wiring

CommLink with IP Module Hardware Connection

CommLink with IP Module Hardware Connection

You have two options for connecting the CommLink to your PC via Ethernet:

- 1.) You can connect the CommLink directly to your PC by using a crossover CAT 5 Ethernet cable (provided) as shown. See *Figure 7* for details.
- 2.) You can connect both your PC and the CommLink to an Ethernet Hub with standard CAT5 cables (by others). See *Figure 8* for details.

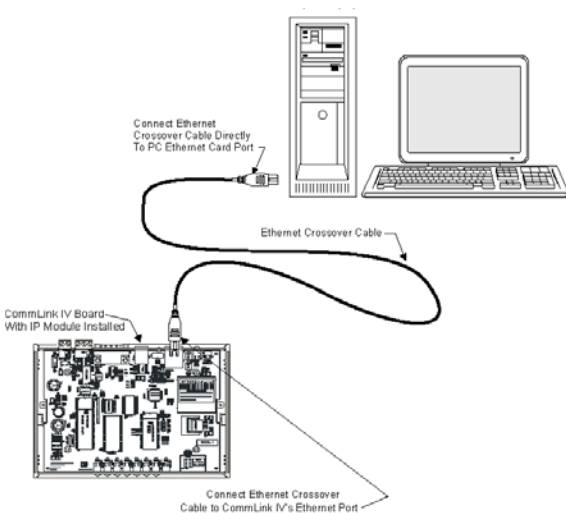


Figure 7: Connecting with Crossover Ethernet Cable (CommLink IV shown)

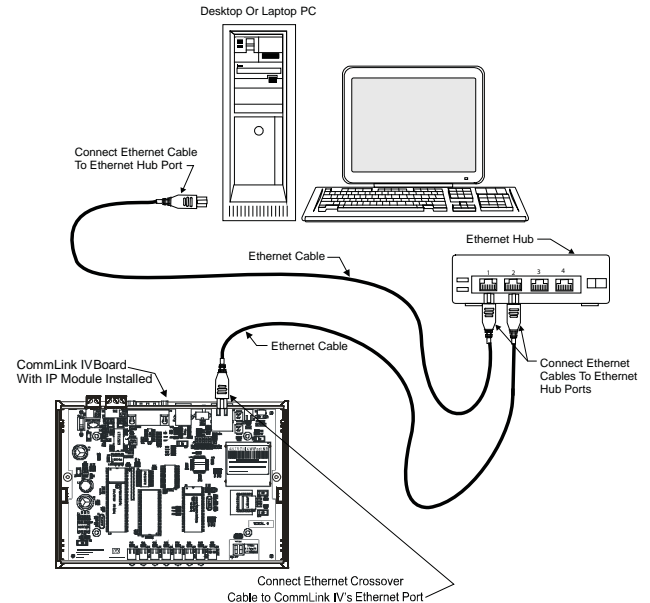


Figure 8: Connecting with Ethernet Cable and Hub (CommLink IV shown)

If using a hub or switch, connect a standard CAT 5 cable from the CommLink to the hub or switch. You will also need to connect your computer to the LAN via standard CAT 5 (by others).

If connecting directly to the CommLink without a hub or switch, use a crossover CAT 5 Ethernet cable. The LNK-LAN LED will light up once power is applied, indicating connection to the LAN.

Power up the CommLink by plugging in the power cable. The CommLink may take up to three minutes to power up completely. Once the CommLink is powered up, you should notice that the red “**LOOP**” LED light on the CommLink remains lit continuously and flickers during communication. See *Figures 17 and 18* for the LED location.

CommLink Configuration

Computer IP Address Set-up for Windows® XP, Vista, or 7

In order for the CommLink to communicate properly, you must set the IP address of the CommLink and computer to be within the same netmask. The following instructions explain how to change your computer's IP address.

- 1.) Click <start>; then click <Control Panel>.
- 2.) Double-click <Network Connections> (XP), <Network & Sharing Center> (Vista), or <Network & Internet> (7), The *Network Connections Window* or *Network & Sharing Center Window* will appear (XP or Vista). Windows 7 users, click <Network and Sharing Center> for the *Network & Sharing Center Window*.

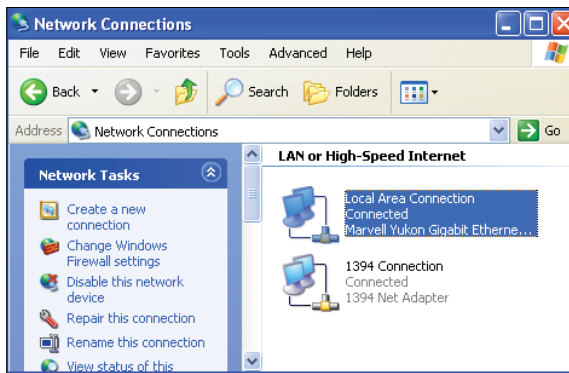


Figure 9: Network Connections Window

NOTE: If any wireless connections are listed, disable them by *right-clicking* the connection and selecting <Disable>.

- 3.) In the *Network Connections Window*, select the **Local Area Connections** entry. (In Vista, find the left panel and click on **Manage Network Connections**.) The *Local Area Connection Status Window* will appear.

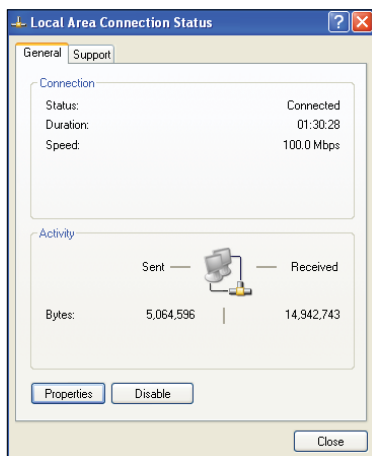


Figure 10: Local Area Connection Status Window

- 4.) Click the <Properties> button. The *Local Area Connection Properties Window* will appear.

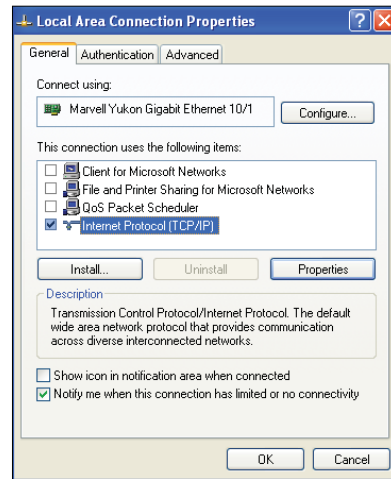


Figure 11: Local Area Connection Properties Window

- 5.) In the *Connection Items List Box*, be sure the Internet Protocol (TCP/IP) is checked (**Figure 9**). (In Vista, this will be TCP/IP v.4.) Click Internet Protocol (TCP/IP v.4) to highlight it and then click <Properties>. The *Internet Protocol Properties Window* will appear.

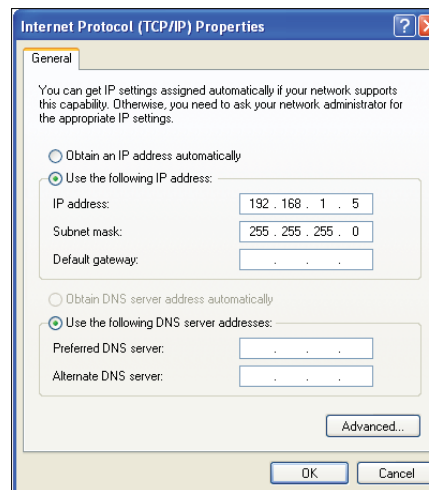


Figure 12: Internet Protocol Properties Window

- 6.) Type in the following information:
 - a.) Make the IP address 192.168.1.5
 - b.) Make the Subnet mask 255.255.255.0
 - c.) Blank out the Default gateway setting (leave the setting blank as shown in **Figure 12**).
 - d.) Blank out the Preferred DNS server setting and the Alternate DNS server setting (see **Figure 12**).

- 7.) Select <OK> until all of the above windows are closed. You may have to *reboot* the computer before the new values are valid.

CommLink Configuration

Changing the IP Address of the CommLink

Follow the instructions below to set your PC's IP address to be in the same subnet as the CommLink. Be sure you have configured your PC's IP address as described on page 12.

- 1.) *Open* the CommLink's IP Module web page by opening your web browser and *entering* the IP address of the CommLink's IP Module into the address bar. The default address is 192.168.1.25
- 2.) *Enter* a password if required. By default, the CommLink does not have a user name or password.



Figure 13: CommLink's IP Module Home Page

- 3.) *Click* <Network Configuration> found in the menu bar on the left side of the web page.

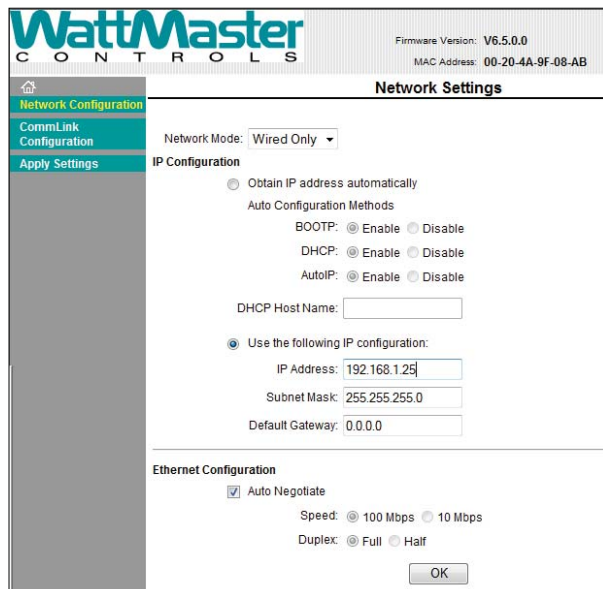


Figure 14: CommLink's IP Module Network Configuration Settings Web Page

- 4.) Under IP configuration, *select* the radio button in front of the option <Use the following IP configuration> and *type in* the IP address, Subnet Mask, and Default Gateway as provided by the jobsite IT staff.

NOTE: Be sure all other settings are set to default as shown in **Figure 14**.

- 5.) *Click* <OK> at the bottom of the *Network Settings Screen* once the changes have been made.
- 6.) If using the CommLink 5, *click* <CommLink Configuration> found in the menu bar on the left side of the web page.

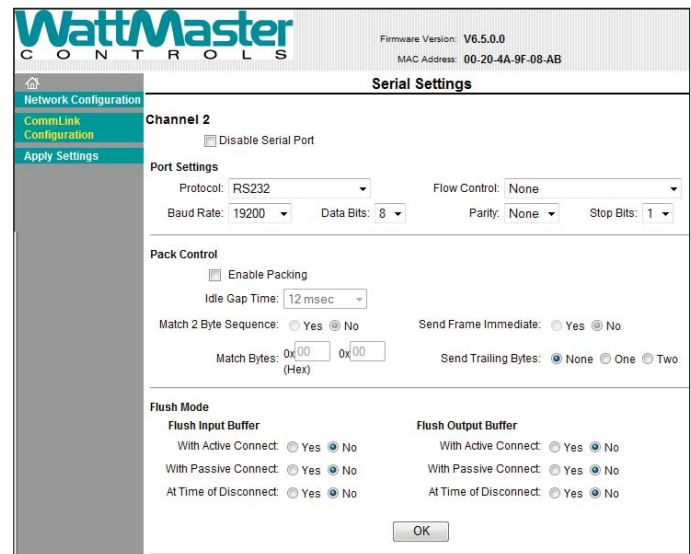
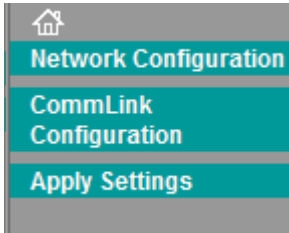


Figure 15: CommLink's IP Module CommLink Settings Web Page

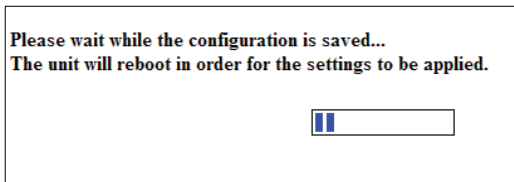
- 7.) Under Port Settings, Baud Rate, *select* the baud rate from the drop down menu. Select either 19,200 for low or 115,200 for high. To determine the baud rate, see *Figure 4 on page 8*.
- 8.) *Click* <OK> at the bottom of the *Serial Settings Screen* once the changes have been made.

CommLink Configuration

9.) After you are done modifying the IP settings, *click* <Apply Settings> in the menu bar to the left.



10.) The following message will appear on the screen and the LNK-LAN LED will blink once:



11.) When the LNK-LAN LED flashes, it indicates that the new settings have been saved. To verify that the changes were successful, first connect the IP Module to the building's network using a standard Ethernet cable. Then make sure your PC has a connection to the Local Area Network and reopen the IP Module Setup Webpage by typing in the newly assigned IP Address.

12.) Be sure to set the IP address in Prism II to the new IP address set up for the CommLink.

Proxy and Firewall Compatibility

Proxy and Firewall configurations may become necessary when the CommLink 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.

Only with proper configuration of the Firewall/Proxy are connections to the CommLink 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.

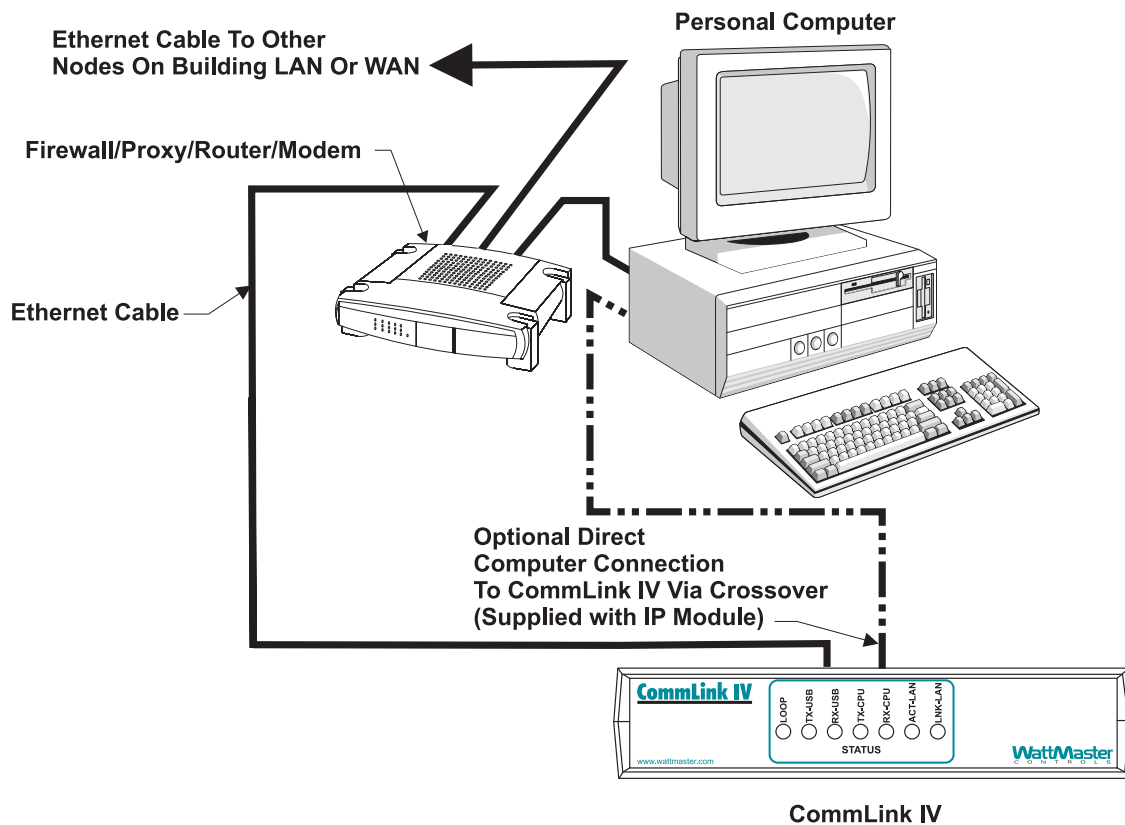


Figure 16: Example Network Diagram of a Firewall or Proxy Configuration (CommLink IV shown)

CommLink IV LED Descriptions

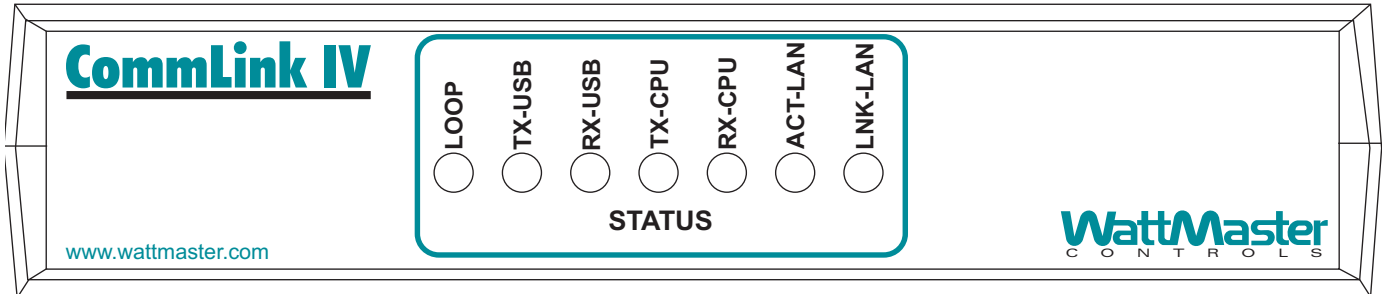


Figure 17: CommLink IV LED Display

CommLink IV LED Descriptions

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

TX-USB - Indicates transmitted data status of USB connection. This LED only flashes if the CommLink IV is directly connected to a computer via a USB port. It will not flash when using the IP Module for LAN or WAN connections.

RX-USB - Indicates received data status of USB connection. This LED only flashes if the CommLink IV is directly connected to a computer via a USB port. It will not flash when using the IP Module for LAN or WAN connections.

TX-CPU - Indicates transmitted data status. This LED flashes when data is sent to Prism II from the CommLink IV using USB or Ethernet.

RX-CPU - Indicates received data status. This LED flashes when data is sent from Prism II to the CommLink IV 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 only flashes if the IP Module is installed and operating.

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

CommLink 5 LED Descriptions

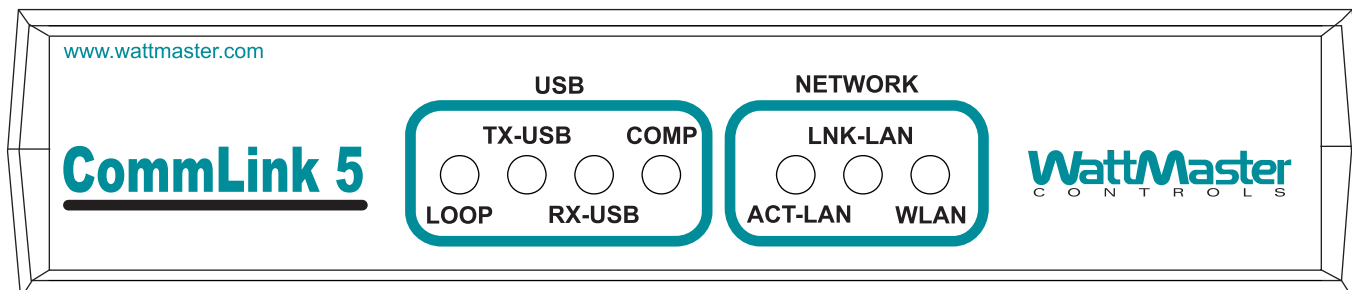


Figure 18: CommLink 5 LED Display

CommLink 5 LED Descriptions

USB LEDs

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 5 is connected to a computer and data is sent to Prism II from the CommLink 5 via USB.

RX-USB - Indicates received data status of USB connection. This LED only flashes when your CommLink 5 is connected to a computer and data is sent from Prism II to the CommLink 5 via USB.

COMP - Indicates connection to your computer. This LED will turn on solid once you plug the USB cable into your computer as long as the connection is not lost.

NETWORK LEDs

ACT-LAN - Indicates activity on the local area network. This LED flashes on when LAN is transmitting and receiving data and is only operational with an Ethernet connection.

LNK-LAN - Indicates local area network is connected. This LED is on when connected to LAN and is only operational with an Ethernet connection.

WLAN - Indicates wireless connection to the local area network. This LED flashes on when LAN is transmitting and receiving data and is only operational with an Ethernet connection.

Troubleshooting

Troubleshooting Procedures

Ethernet Connection When the device is connected to a hub, verify that the LINK LED is lit on the CommLink device and the ACT LED occasionally blinks. The ACT LED indicates network activity and may be reflecting other network traffic.

Ethernet Connection, Routing Verify the route is available to the CommLink and firewalls or proxies are configured to pass TCP network traffic on port 39288 if necessary. This can be verified by your Network Administrator.

IP Address Verify that the assigned IP Address is valid for the local network and that it is not in use by any other device. Try to PING the CommLink's IP address to confirm the address is correct and responding.

NOTE: Make sure that the CommLink is connected as shown in *Figure 16* and all installation procedures have been completed prior to using the "ping" command.

Prism II Software Verify that the IP address is correctly entered in the connection profile for the CommLink. Also verify that the port is left blank in the profile. This port area specifies Comm port settings, not an IP address port.

TCP Port Address The TCP port address 39288 is hard coded into the EPROM of the CommLink and in Prism II software. It cannot be changed by the end user. The TCP port address needs to be set in your Prism II connection.

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.

To do this, open a DOS session by opening a command prompt:

1. To open a command prompt, *click* <Start>, *point* to <All Programs>, *point* to <Accessories>, and then *click* <Command Prompt>.
2. PING to the IP Address by *typing*:
ping IP address

Example: ping 192.168.1.25
3. *Press* <Enter> on the keyboard.
4. If no reply is received, first check your PC's IP address and Ethernet connections. If problems persist, consult your network administrator.

