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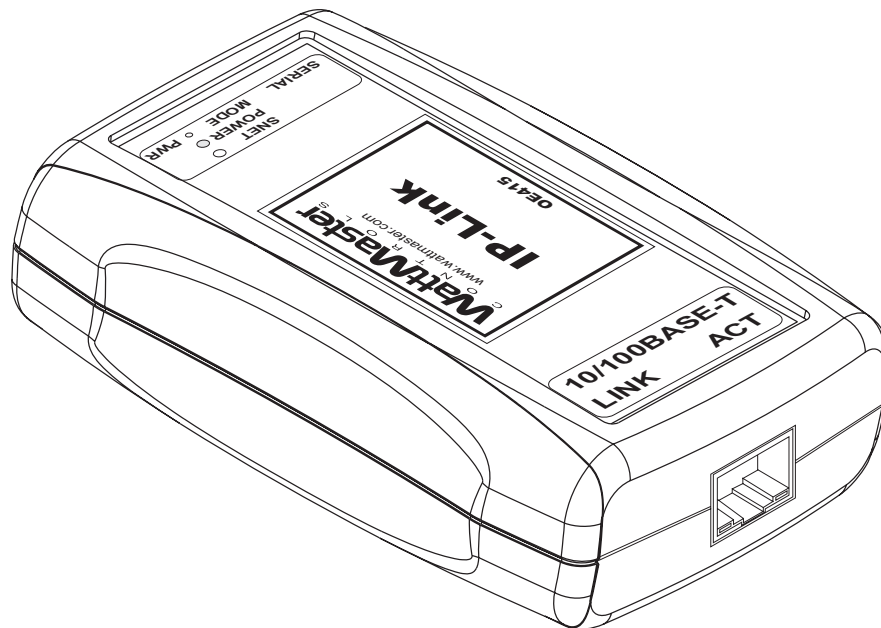
IP-Link
Installation Guide

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General Information

CommLink II and IP-Link Connection

The IP-Link (iLAN-100) 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 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 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 dialer/connection profiles can be created to facilitate monitoring several sites.

System Overview

The IP-Link is a stand-alone network appliance that has been adapted to connect the CommLink II (with IP-Link EPROM chip) to a 10BaseT or 10/100 network connection. The IP-Link 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 IP-Link. 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 easily 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 software. The IP-Link will respond to ICMP traffic (PING) for verification of proper configuration, but Prism software is required in order to send and receive data to the IP-Link and CommLink II.

System Requirements

To program the IP-Link to work with Prism, you will need:

- The Prism Software CD (supplied with the IP-Link)

- A PC with an RS-232 serial communications port (supplied by others)

- Ethernet RJ-45 6 ft. long cable (supplied with the IP-Link) or a longer RJ-45 Ethernet cable (supplied by others) and an available port to connect the IP-Link to the LAN

- Microsoft Windows 98, NT, 2000, or XP (must be installed on the PC you are going to use)

- The IP-Link Connect One's iChip Configuration Software (Windows-based program on the supplied CD)

- IP-Link Serial Cable with two DB-9 connectors (and one DB-25 connector for computers that require a DB-25 instead of a DB-9 connector)—supplied with the IP-Link

- An IP Address, Subnet Mask, and Gateway Address for the IP-Link configured for your LAN by your network administrator

- MiniLink or MiniLink Polling Device, connected to the CommLink and Controller(s) and powered on

- CommLink II set to Multi-mode, connected to the MiniLink or MiniLink Polling Device and powered on

- EPROM chip SS0058—Remove the old CommLink Chip (SS0039) from the CommLink and replace it with the IP-Link EPROM chip SS0058 (supplied)

NOTE: To quickly configure the IP-Link, you may enter all of the required information in the *Quick Setup Screen* of the iChip Configuration Software. **Please note:** The IP-Link is also referred to as the iLAN 100 in the software screens.

Programming

Programming the IP-Link

Connecting the IP-Link to your PC

1. Connect the IP-Link's supplied 120/9 VAC power supply to a 120/1/60 duplex outlet. Do not plug the power supply into the IP-Link yet (you will do this in Step 4).

2. Connect one DB-9 connector (or DB-25 connector if your computer requires one) to the serial port connector on the IP-Link and connect the other DB-9 connector to COM1 or COM2 serial port on your PC.

3. Connect one end of the Ethernet RJ-45 cable to the IP-Link's 10BaseT connector and connect the other end to a 10BaseT port on your LAN.

4. Power on the IP-Link by connecting it to the power supply cable.

5. Insert the CD in the CD drive of your PC. Run the Setup.exe in the \Software directory to install the configuration software.

Installing and Starting the iChip Config Program

The iChip Config Program enables you to set the IP-Link's IP address and network mask. The gateway address is optional but not necessary for proper operation. To install the program from the CD, simply install the setup.exe program found in the \Software directory. After the program is installed, open it by clicking Start ->All Programs->ConnectOne->iChipConfig (see Figure 1).

Figure 1: Connect One Directory

NOTE: iChip Config will try to connect to the IP-Link using first COM1 and then COM2, in that order.

Open the iChip Config Program. When the Connect One device is found, the *Main Menu* will appear. (See Figure 2).
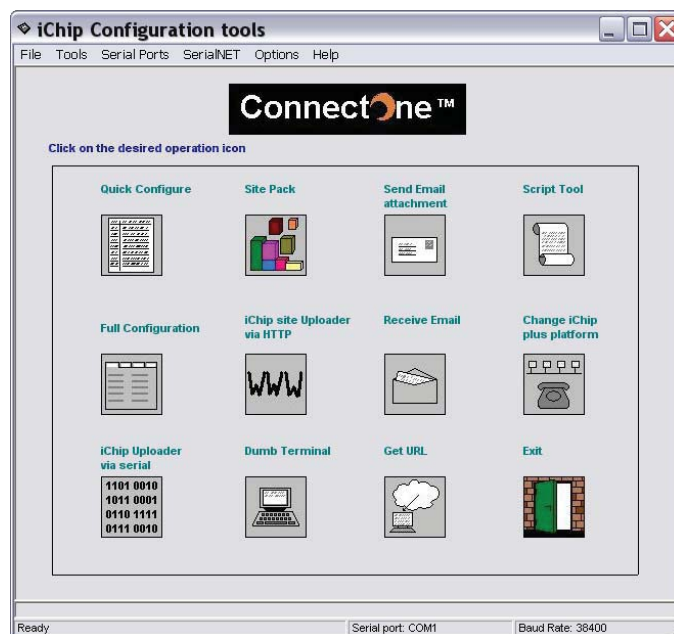

Figure 2: The iChip Config Program *Main Menu*.

Programming

The Quick Configure Screen enables you to enter all parameters needed to connect to the Internet/Intranet through a 10BaseT Ethernet LAN. From the *Main Menu*, click on Quick Configure to enter the IP-Link Setup (see Figure 2). At this point, the iChip LAN *Quick Configuration Screen* will appear (see Figure 3). At this time, verify the Firmware version is dated 24.5.2004 or later as shown and that the Boot Block is 0706. If this is not the case, the firmware should be updated to ensure proper operation. If the Firmware version and Boot Block are current, enter the IP Address and Subnet Mask. Leave the Use DHCP and Use IP Finder boxes clear and the rest of the form blank. The IP-Link doesn't require any other parameters to be filled in on the screen and may not function correctly if additional information is entered. The factory default IP address 0.0.0.0 will cause the IP-Link to get a valid IP address from any existing Dynamic Host Configuration Protocol (DHCP) server on your network. DHCP is not recommended unless a static reservation can be made for the IP-Link's MAC Address. When finished entering parameters, click on the Save button, and the address and subnet will be stored in flash memory.

Figure 3: *Quick Configure Screen*

Close this form and cycle power to the IP-Link. Click on Quick Configure again (a restart of the program may be necessary) and verify that the parameters entered are still correct. The saved parameters will appear in the form boxes. (See Figure 4).

Figure 4: Saved Configuration Screen

NOTE: These parameters only serve as an example of what the configuration could look like. Your IP addresses could be different. Consult with your IT Department or Internet service provider for your particular IP address settings.
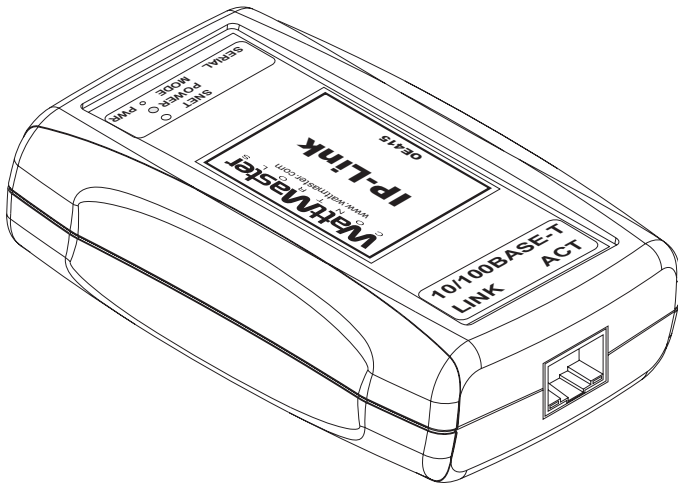
Connecting the Network

Connecting the IP-Link/CommLink II Network

See Figure 8 for connection of the IP-Link to your control system and for information on installing the IP-Link EPROM in the CommLink II.

Connectivity to a CommLink II through the network is established when there is a route for TCP/IP traffic generated from a PC running Prism Software to communicate with the IP-Link-enabled CommLink II. The CommLink II must have the appropriate EPROM chip installed (SS0058) to initiate the process of opening communications with the IP-Link and starting the TCP port service.

Connecting the IP-Link to your network or Internet connection is accomplished by connecting an Ethernet RJ-45 cable to the Ethernet port on the front of the IP-Link and connecting the other end to your existing network's hubs or switches. Another configuration may have the IP-Link connect directly to the back of an ADSL or Cable Modem. In either case, a link light should confirm a positive Ethernet connection.

Connecting the IP-Link to a CommLink II is accomplished by connecting the serial cable with two DB9 connectors to the back of the IP-Link and to the Remote Link or DTE port on the back of the CommLink II. After powering up the two devices, units will establish communication and there will be rapid and continuous activity on the RLINK LED on the CommLink II. This LED will blink non-stop and many times per second.
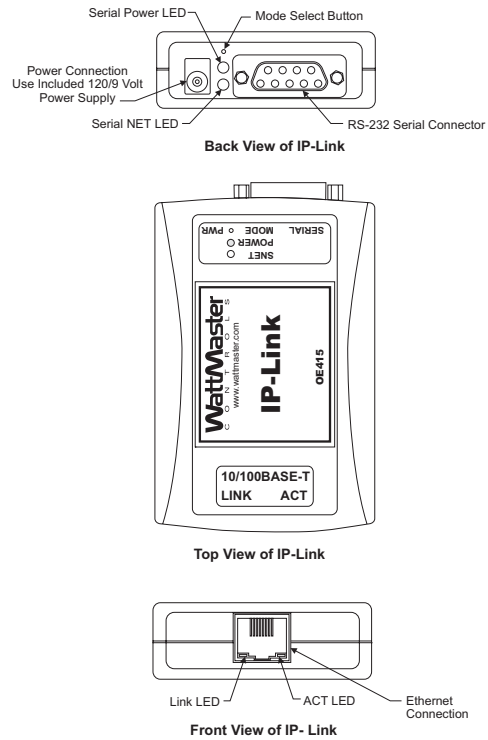
Figure 6: Back, Top, and Front Views of the IP-Link

Prism Software Setup is done by opening the *Job-Site List & Connection Method Window*. Select an empty row and enter a Site Name in the Location and an IP Address. Leave the Port and Phone Number settings blank for that row. Select the Site Location as you would normally and select Go Online from the *Communications Menu*.

Figure 7: Job-Site List and Connection List

NOTE: These parameters serve only as an example of what the configuration could look like. Your IP address and Location name could be different.

Connecting the Network

Computer Connection Diagram Using IP-Link For Remote Connection

For Orion Systems Connect To MiniLink PD Network Terminals
For WattMaster VAV Systems Connect To MiniLink Network Terminals
For Auto-Zone Systems Connect To MiniLink Network Terminals
For WattMaster WHP Systems Connect To MiniLink Network Terminals

Typical Terminal Blocks. All Wiring To Be T To T, SHLD (G) To SHLD (G) & R To R

T G R
485 LOOP
T
SHLD
R

CommLink II
Front View of CommLink

CommLink II
LOOP COMP BLINK
STATUS
WattMaster

110 VAC To 24 VAC Power Pack

Wire To Be 2 Conductor Twisted Pair With Shield. Use Belden #82760 Or Equivalent.

Back View of CommLink

SERIAL #
REMOTE LINK (DTE)   COMPUTER (DCE)   485 LOOP   24V GND POWER

9 Pin Female End

9 Pin Female Connector

8 Conductor Modular Cable Assembly

Molded Cable Assembly Supplied With IP-Link Kit

25 Pin Female Connector (If Reqd)

9 Pin Female Connector

Connection To Computer Serial Port (Optional. See Note 1.)

APrism

Personal Computer (Optional, By Others. See Note 1)

110 VAC To 9 VDC Power Pack

Back View of IP-Link

9 Pin Male End Connect To Serial Port On IP-Link

Notes:
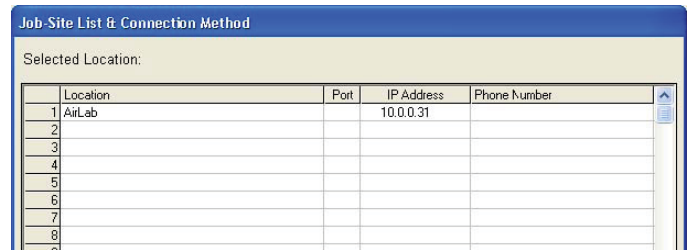1.) Direct Connection From The Computer Serial Port To The CommLink II Is Not Required But It May Be Connected If Desired. Communication With The Control System Is Available Through The IP-Link Ethernet Connection To The Building LAN By Any Computer on The LAN Via The IP-Link's Ethernet IP Address.

2.) You Must Set The CommLink II Internal Switch To "Multi" For All Applications.

3.) You Must Replace The CommLink II EPROM (SS0039) With The IP-Link EPROM (SS0058) Supplied With The IP-Link Kit.

Top View of IP-Link

WattMaster
IP-Link
10/100Base-T
LINK ACT

Connect Supplied 6 Ft. Ethernet RJ-45 Cable Assembly Or Longer Ethernet RJ-45 Cable (Supplied By Others) To 10/100Base-T Port Connection On Ethernet Router Or Modem (Supplied By Others)

Front View of IP- Link

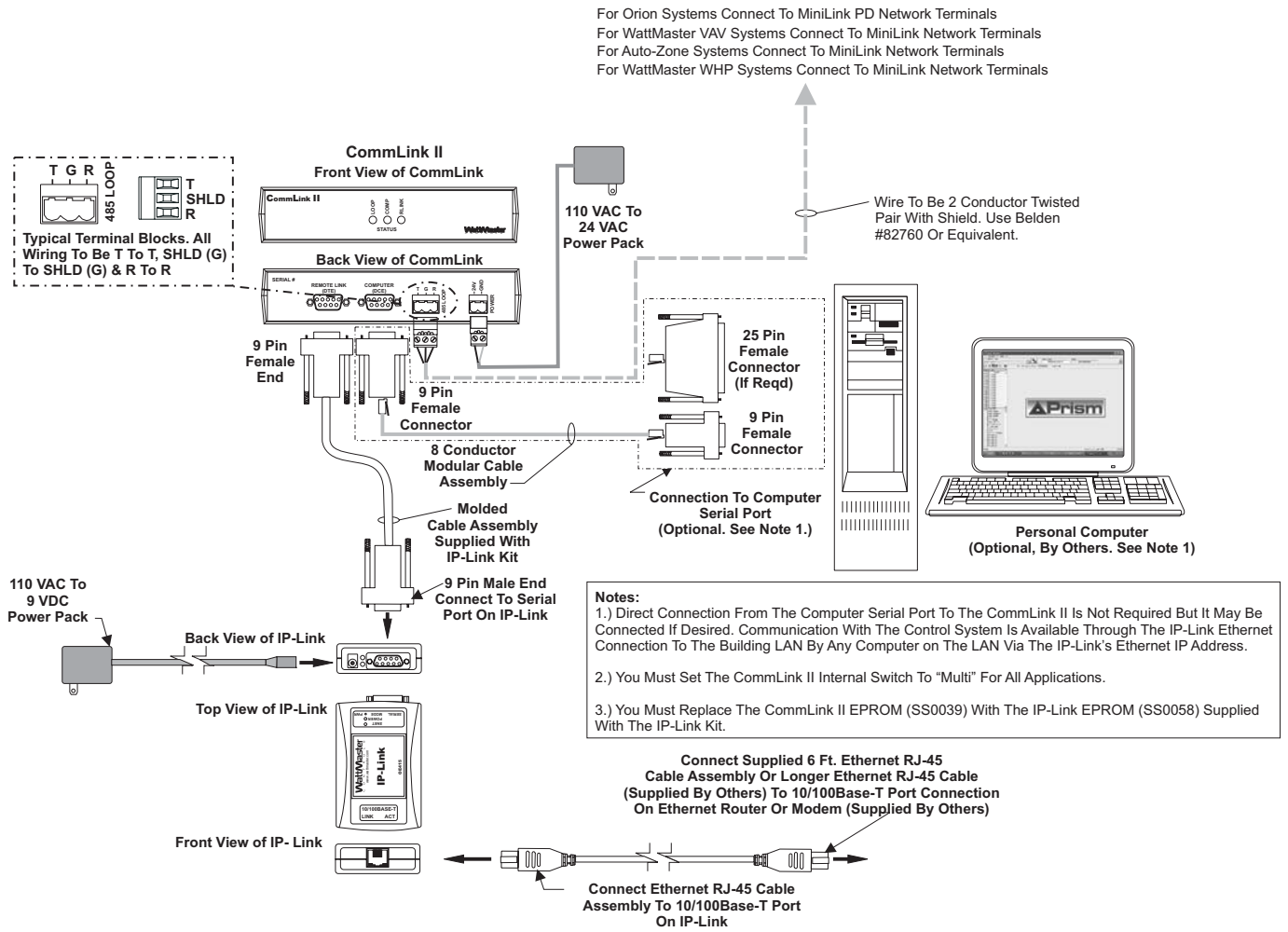**Connect Ethernet RJ-45 Cable Assembly To 10/100Base-T Port On IP-Link**

Figure 8: Computer Connection Using the IP-Link

Connecting the Network

Proxy and Firewall Compatibility

Proxy and Firewall configurations may become necessary when the IP-Link 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 IP-Link.

Only with proper configuration of the Firewall/Proxy are connections to the IP-Link 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 passes unless there is no traffic from the remote PC.
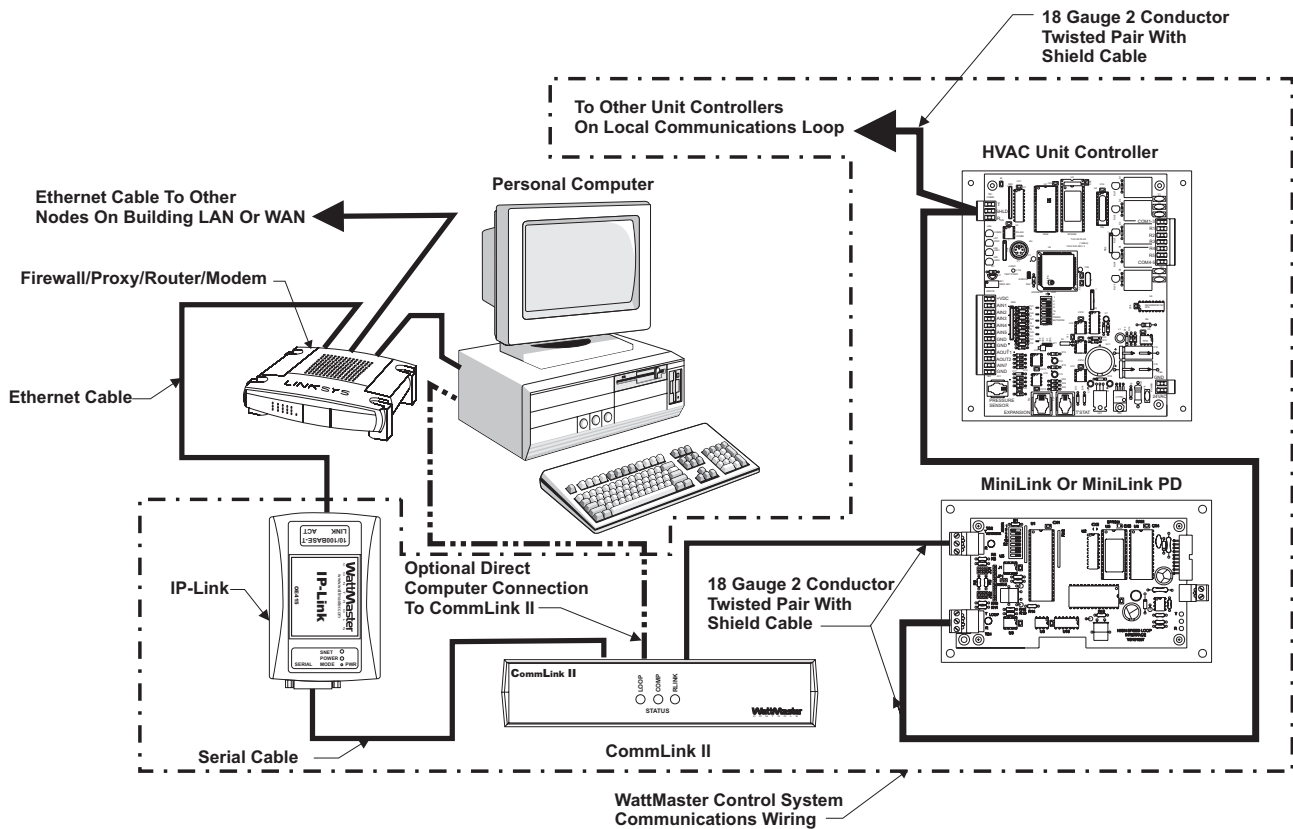

Figure 9: Example Network Diagram of a Firewall or Proxy Configuration

Troubleshooting

Troubleshooting Procedures

Ethernet Connection Verify the LINK LED is lit on the IP-Link device and the ACT LED occasionally blinks when the device is connected to a hub. The ACT LED indicates activity that may be reflecting other network traffic. Depending on your existing LAN/WAN, a crossover cable may be necessary to connect to the network.

Ethernet Connection, Routing Verify the route is available to the IP-Link and firewalls or proxies are configured to pass TCP network traffic on port 39288 if necessary.

Firmware Click on iChip Uploader Via Serial from the iChip Configurations *Tools Main Menu* to display the current version of Boot Block and Firmware. You can contact the WattMaster Controls Technical Support Department if you believe you need new firmware. Upload Boot Block and Firmware by clicking on the Firmware button and loading the boot block image file followed by the firmware image. Boot Block must be loaded first! A power cycle will be necessary after loading new firmware.

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 IP-Link's IP address to confirm the address is correct and responding.

> **NOTE:** Make sure that the IP-Link is connected as shown in Figure 8 and all installation procedures have been completed prior to using the "PING" command.

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_IPaddress

3. Press Enter.

IP Address, Port Verify that the assigned port is valid by attempting to telnet to port 39288 on the IP-Link.

> **NOTE:** Make sure that the IP-Link is connected as shown in Figure 8 and all installation procedures have been completed prior to using the "telnet" command.

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. Telnet to the IP-Link's IP Address and Port by typing:

    telnet_IPaddress_39288

3. Press Enter.

If the port is closed, the telnet session will not establish a connection. If the port is open, the telnet session will connect, but the window will remain blank as the data coming from that port is unreadable without Prism Software.

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

Serial Cable Use the cable shipped with the IP-Link. Verify that the serial cable is connected from the IP-Link device to the Remote Link port on the CommLink II. On older CommLink II's, the port may be labeled Synchronous Data Link or DTE.

Serial Connection Verify that the SNET LED is blinking rapidly on the IP-Link. The RLINK LED (SLINK LED on older CommLink II's) on the CommLink II will blink rapidly once the port is opened on the IP-Link from the CommLink II.

TCP Port Address The TCP port address 39288 is hard coded into the EPROM of the CommLink II and in Prism Software. It cannot be changed by the end user.

MiniLink Make sure there is at least one MiniLink or MiniLink Polling Device connected to the CommLink II and the Controller(s) on your system. It must also be powered on.

> **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.

Appendix

Appendix A

Notes on the IP-Link The IP-Link is functionally the same as the previous version with a few small differences.

1. There are only two LEDs on the unit indicating a LINK condition on the Ethernet and Activity on the same link.

2. The Ethernet Port is now 10/100 capable which allows greater flexibility when connecting to an existing network.

3. There is no longer a RCV and SER LED on the unit. As a result, in order to verify communication between the CommLink II and the IP-Link, the installer will have to observe the RLINK LED on the CommLink II. The LED will be lit but will display a rapid but faint flicker if proper communication is established. Verification of an active address by PING or telnet procedures stated previously will also prove proper operation.

Notes

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