



Raritan PX3TS

The PX3TS transfer switch provides AC power to rack IT equipment from one of two AC power sources, and automatically selects which source powers the load based on power availability and quality.

This Quick Setup Guide is intended for experienced users. For detailed instructions, refer to the PX3TS transfer switch online help from the **Support page** (<http://www.raritan.com/support/>) on Raritan's website.

Safety Precautions

WARNING! Read and understand all sections in this guide before installing or operating this product. Failure to heed any of the following WARNINGS may result in electric shock, fire, personal injury and death. Prior to operating this product, the user should read the online help and specifically the warnings in the online help.

WARNING! Connect this product to an AC power source whose voltage is within the range specified on the product's nameplate.

WARNING! Connect this product to an AC power source that is current limited by a suitably rated fuse or circuit breaker in accordance with national and local electrical codes.

WARNING! Use this product in a dry location.

WARNING! Connect this product to a protective earth ground. Never use a "ground lift adaptor" between the product's plug and the wall receptacle.

What's Included

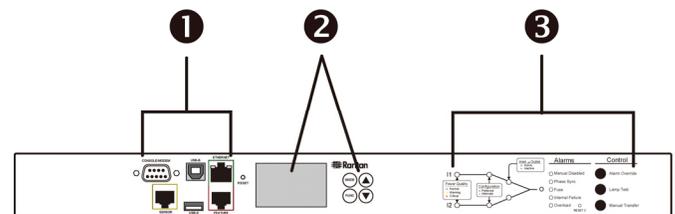
- The PX3TS device
- Bracket pack and screws
- Quick Setup Guide
- Warranty card
- Two replacement fuses for the inlet transfer switch

Note: Depending on your PX3TS' ratings, appropriate fuse types vary. You can order additional fuses from Raritan. See Technical Specifications in the Online Help for appropriate fuse types and Raritan part numbers for these fuses.

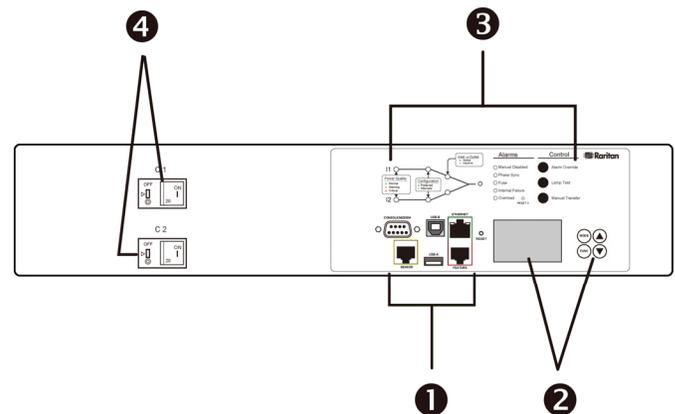
- A null-modem cable with DB9 connectors on both ends (Raritan number: 254-01-0006-00) (optional)

Front View

▶ 1U models:



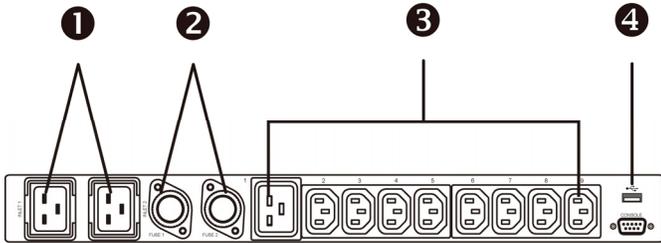
▶ 2U models:



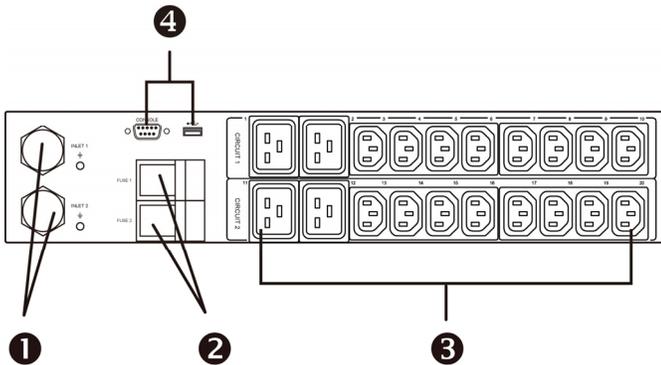
1. Six connection ports
2. LCD display and control buttons
3. Transfer switch indicator lamps and control buttons
4. Overcurrent protectors - one for each bank of outlets (available on some models only)

Rear View

▶ 1U models:



▶ 2U models:



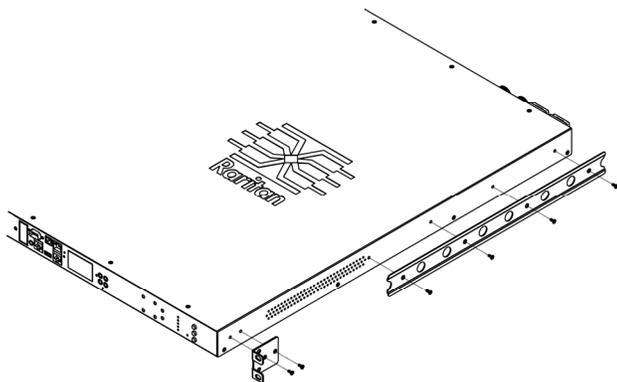
1. Inlets
2. Fuses - one per inlet
3. Outlets
4. Two connection ports

Mounting a PX3TS Device

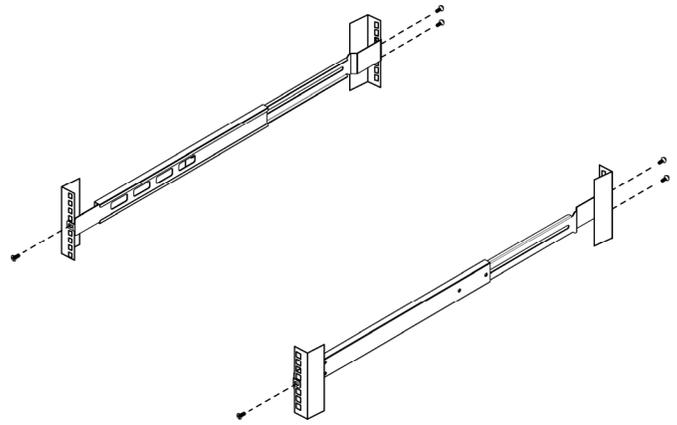
Using appropriate brackets and tools, fasten the 1U or 2U PX3TS device to the rack or cabinet. The way to install a PX3TS device varies according to the device length.

▶ To mount a PX3TS device which is long:

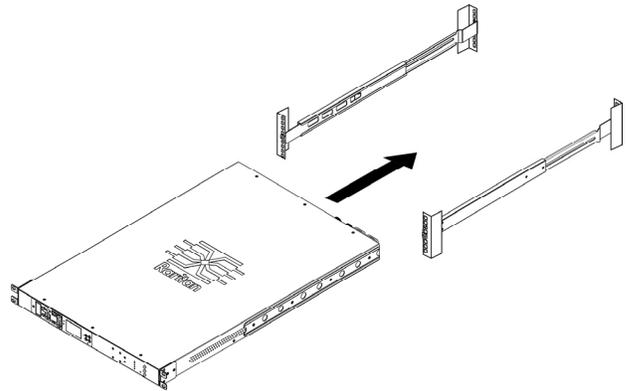
1. Attach mounting ears and mounting brackets to each side of the PX3TS with provided screws.



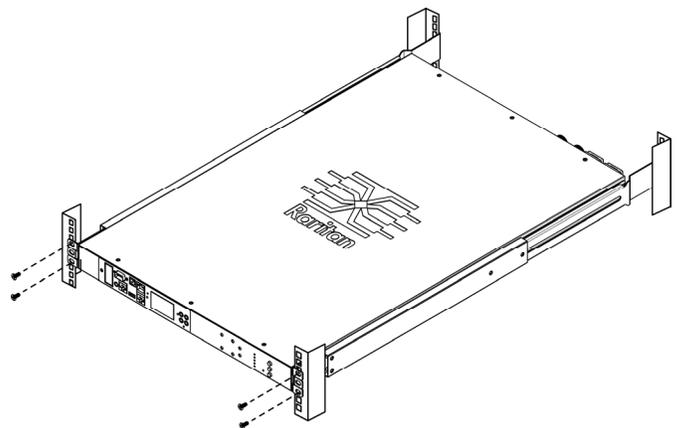
2. Adjust slide-rail assemblies to match your rack posts and fasten them to the rack using your own fasteners.



3. Line up the mounting brackets with slide-rails and push this product into rails.

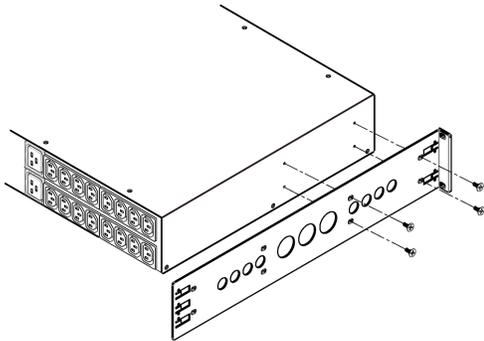


4. Fasten front mounting ears to the rack using your own fasteners.

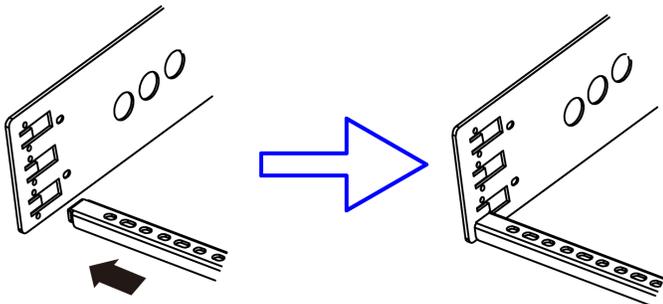


► **To mount a PX3TS device which is short:**

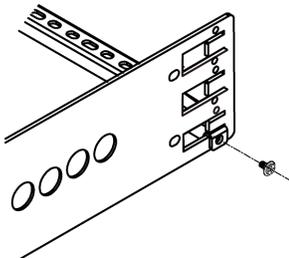
1. Attach a rackmount bracket to both sides of the PX3TS with the provided screws. For a 1U model, the total number and locations of screw holes are different from the following 2U diagram.



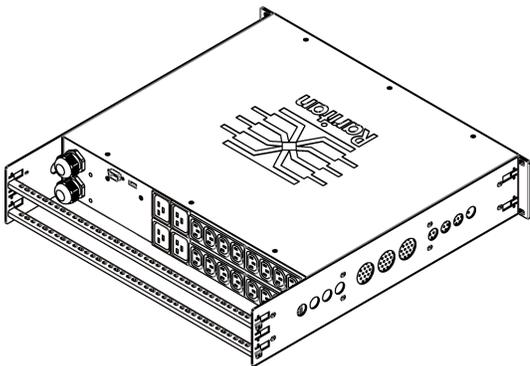
2. Insert the cable-support bar into rackmount brackets.



3. Secure with the provided end cap screws.



4. On a 2U model, repeat the above steps to install another cable-support bar.



5. Fasten the rackmount brackets' ears to the rack using your own fasteners.

Inlet and Outlet Power Connections

The PX3TS connects to two different, but identically rated, branch circuits.

The PX3TS will operate when the branch circuit voltages are out of phase, but works most reliably and fastest when in phase. The front panel Phase Sync lamp lights if inlets are out of phase.

Connecting Power and Equipment

Your PX3TS may have fuses and/or circuit breakers. Verify that all are firmly seated or set to ON before connecting power.

The PX3TS inlets are labeled INLET 1 (I1) and INLET 2 (I2). INLET 1 is the factory default preferred inlet, and INLET 2 is the factory default alternate inlet.

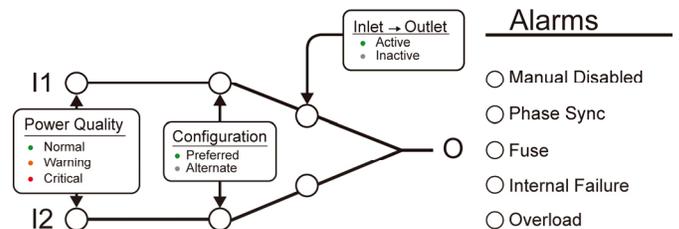
Tip: You can switch preferred and alternate inlets if needed. See **Manual Transfer** (on page 5).

► **To make power connections:**

1. Connect PX3TS inlets to branch circuits.
2. Connect loads to PX3TS outlets.
3. Apply power to branch circuits.

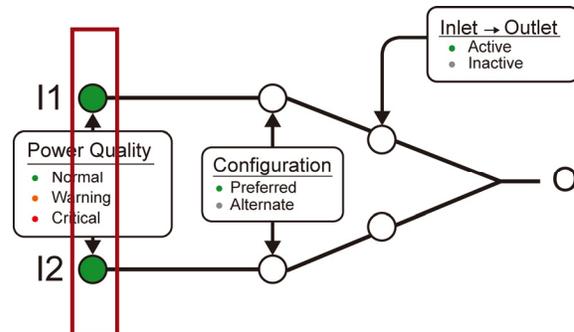
Testing Indicator Lamps

Press the Lamp Test control button and visually verify that all transfer switch indicator lamps turn on. See **Control Push Buttons** (on page 4).



Power Quality Indicator Lamps

Inlet power quality is shown using a tricolor LED.



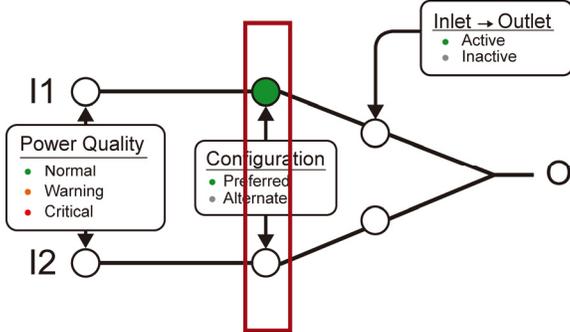
- Normal (green): Power quality (voltage and frequency) is good.
- Warning (orange): Power quality is not optimal but acceptable.
- Critical (red): Power is not available or power quality is not acceptable.

Note: See **Power Quality Setup** (on page 6) for how to configure voltage and frequency settings.

Inlet Configuration Indicator Lamps

A green LED indicates which inlet is preferred. The default is Inlet 1.

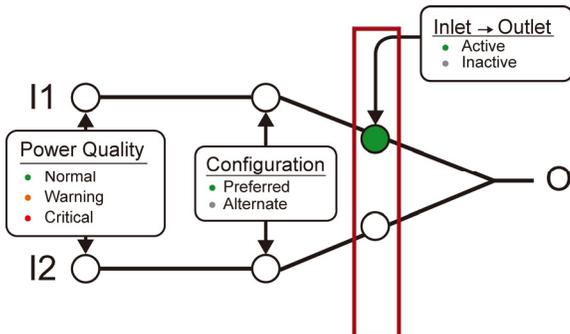
The preferred inlet powers the outlets unless its power quality goes critical. The Manual Transfer button may change the preferred inlet. See **Control Push Buttons** (on page 4).



Active Inlet Indicator Lamps

A green LED indicates which inlet is powering the outlets. Only one LED is on at a time.

The Manual Transfer button transfers power to the other inlet.



Alarm Indicator Lamps

Alarms

- Manual Disabled
- Phase Sync
- Fuse
- Internal Failure
- Overload

Lamp	Meaning
Manual Disabled	The front panel Manual Transfer button is disabled. See Control Push Buttons (on page 4).
Phase Sync	Inlets are out of phase.
Fuse	Blown fuse. The replacement fuse must be either the same as the Raritan-provided fuse or equivalent. To order fuses from Raritan, see Technical Specifications in the Online Help for appropriate fuse types and Raritan part numbers.
Internal Failure	Internal hardware failure. Contact Raritan technical support. The web interface contains additional indicators for specific internal failures.
Overload	Power to load is turned off due to a short circuit.

Control Push Buttons

Control

- Alarm Override
- Lamp Test
- Manual Transfer

Button	Action taken when pressed
Alarm Override	Forces a manual transfer during an alarm condition.

Button	Action taken when pressed
Lamp Test	Turns on all transfer switch indicator lamps. Power Quality LEDs turn orange.
Manual Transfer	Transfers power to the other inlet. Newly-activated inlet becomes the preferred inlet.

Operating Modes

Normal: The preferred inlet is active while the alternate inlet is in the normal or warning state.

Non-redundant: The preferred inlet is active while the alternate inlet goes critical or loses power.

Standby: The alternate inlet is active.

Off: Neither inlet is active because of an alarm or internal failure, or because both inlets go critical. See **Manual Transfer** (on page 5) for restoring power.

Automatic Transfer

An automatic transfer to the alternate inlet occurs when the preferred inlet's power quality goes critical.

An automatic retransfer back to the preferred inlet occurs when the preferred inlet's power quality returns to normal.

Note: See **Transfer Options Setup** (on page 6) for retransfer settings.

Manual Transfer

The Manual Transfer button changes the active inlet and also sets the newly-activated inlet to be the preferred inlet.

The Manual Transfer button is disabled when an alarm lamp is active. Use this procedure to override the alarm and force a manual transfer.

1. Correct the problem in load that caused the alarm.
2. While holding down the Alarm Override button, press Manual Transfer.

Note: This procedure does not apply when the Manual Disabled or Fuse alarm lamp is turned on.

Connecting the PX3TS to Your Network

1. Connect a standard network patch cable to the ETHERNET port on the PX3TS.
2. Connect the other end of the cable to your LAN.

Note: You can also connect to a wireless network. See **Appendix B: Wireless Configuration** (on page 9).

PX3TS Configuration

Note: If your networking environment is not the DHCP IPv4 networking environment, for example, an IPv6 network, refer to **Appendix A: Configuration via a Connected Computer** (on page 7) for initial configuration.

Step 1: Display the IPv4 Address

The DHCP-assigned IPv4 address is available using the front panel display.



► To display the IPv4 address:

1. Press the MODE button to enter the Device mode, indicated by an alphabet "d" at the top left of the display.
2. The LCD display cycles between the four octets of the IPv4 address, indicated by "i4" at the upper right corner of the display.

For example, 192.168.84.4 cycles in this sequence:

192 --> 168 --> 84 --> 4

Note: If your network only supports IPv6 or DHCP is unavailable, the IP address must be configured through a direct connection to a computer. See **Appendix A: Configuration via a Connected Computer** (on page 7).

Step 2: Log in to the PX3TS Web Interface

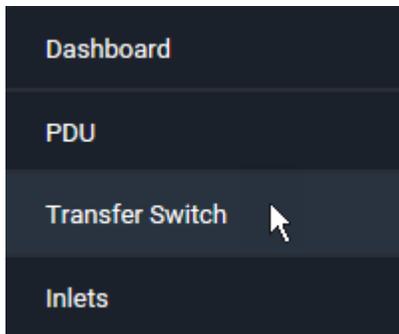
1. Open a web browser and type the IP address of the PX3TS device.
 - If the link-local addressing has been enabled, you can type *pdu.local* instead of an IP address. See **Appendix A: Configuration via a Connected Computer** (on page 7).



2. Accept any security warnings that may appear.
3. Type the default user credentials and click Login.
 - User name: admin
 - Password: raritan
4. When prompted to change the password, change or ignore it.
 - To change it, type the new password and click Ok.
 - To ignore it for this time only, click Not Now.
 - To ignore it permanently, select "Do not ask again" and click Not Now.

Step 3: PX3TS Web Configuration Overview

1. In the left menu, click Transfer Switch.

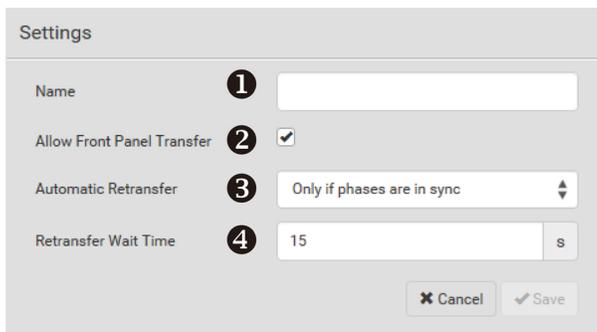


2. Click Edit Settings to configure the transfer options.
3. Click Edit Power Quality Parameters to configure power quality.



Transfer Options Setup

1. (Optional) Assign a name to the inlet transfer switch if wanted.
2. Enable/disable the front panel Manual Transfer button.
3. Enable/disable automatic retransfer, and determine whether to perform retransfer when inlets are out of phase. Retransfer is the transfer back to normal operation when preferred inlet power is restored.
4. Enter the time (seconds) preferred inlet power must be in the normal state before retransfer occurs.



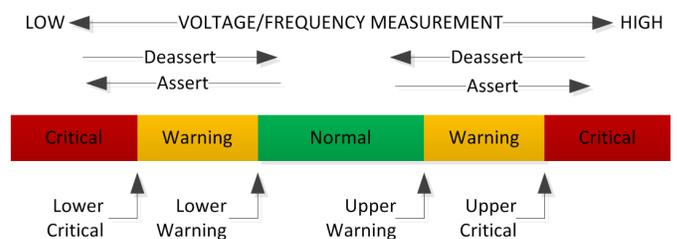
Power Quality Setup

Inlet power quality state (normal/warning/critical) is derived from the inlet's voltage and frequency quality - whichever is lower. If voltage or frequency is critical, power quality is

critical. If either is warning, quality is warning. When both are normal, power quality is normal.

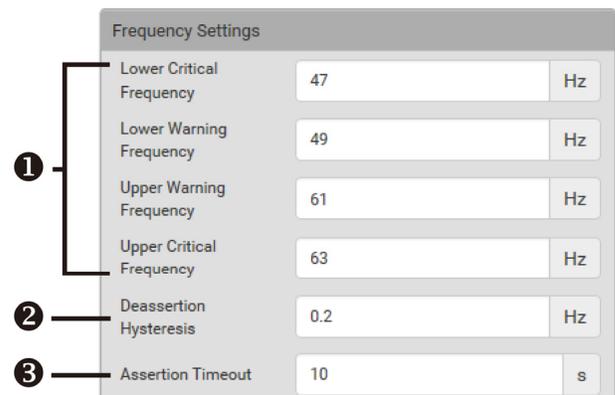
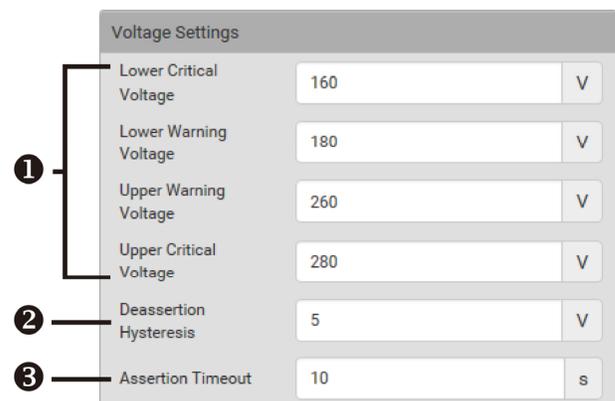
PX3TS transfers to standby operation when preferred inlet power quality goes critical and retransfers to normal operation when power quality returns to normal. The warning state does not cause transfers and is intended as an early warning indication of a possible problem.

When quality goes from better to worse, the state change is said to assert. You configure how long the quality must remain in the worse state before the state change actually occurs. When quality goes from worse to better, the state change is said to deassert. You configure the hysteresis - how much the quality must be better than the threshold - before the state change occurs.



Voltage and frequency configuration is identical.

1. Enter upper and lower thresholds for warning and critical.
2. Enter deassertion hysteresis values.
3. Enter assertion times (seconds).



Appendix A: Configuration via a Connected Computer

To use the command line interface (CLI) for configuration, establish an RS-232 or USB connection.

To use a web browser for configuration, make a network connection to the computer. The PX3TS is automatically configured with the following link-local addressing in any network without DHCP available:

- `https://169.254.x.x` (where x is a number)
- `https://pdu.local`

Step 1: Connect the PX3TS to a Computer

Establish one of the following connections to a computer.

► Serial connection for "DB9" RS-232 connector on PX3TS:

1. Connect one end of the null-modem DB9 cable to the male "DB9" RS-232 port labeled CONSOLE / MODEM on the PX3TS.
2. Connect the other end to your computer's RS-232 port (COM).
3. Perform **Step 2: Configure the PX3TS via CLI (Optional)** (on page 7).

► USB connection:

1. A USB-to-serial driver is required in Windows®. Install this driver before connecting the USB cable. See **Installing the USB-to-Serial Driver (Optional)** (on page 9).
2. Connect a USB cable between the PX3TS device's USB-B port and a computer's USB-A port.
3. Perform **Step 2: Configure the PX3TS via CLI (Optional)** (on page 7).

► Direct network connection:

1. Connect one end of a standard network patch cable to the ETHERNET port of the PX3TS.
2. Connect the other end to a computer's Ethernet port.
3. On the connected computer, launch a web browser to access the PX3TS, using either link-local addressing: `pdu.local` or `169.254.x.x`. See **PX3TS Configuration** (on page 5). You CANNOT use the CLI for this connection.

Note: Make sure the computer's wireless interface is disabled.

Step 2: Configure the PX3TS via CLI (Optional)

You perform the following over an RS-232 or USB connection only.

► To configure the PX3TS via CLI:

1. On the computer connected to the PX3TS, open a communications program such as HyperTerminal or PuTTY.
2. Select the appropriate COM port, and set the following port settings:
 - Bits per second = 115200 (115.2Kbps)
 - Data bits = 8
 - Stop bits = 1
 - Parity = None
 - Flow control = None

Tip: For a USB connection, you can determine the COM port by choosing Control Panel > System > Hardware > Device Manager, and locating the "Dominion PX2 Serial Console" under the Ports group.

3. In the communications program, press Enter to send a carriage return to the PX3TS.
4. The PX3TS prompts you to log in. Both user name and password are case sensitive.
 - a. Username: admin
 - b. Password: raritan (or a new password if you have changed it).
5. If prompted to change the default password, change or ignore it.
 - To change it, follow onscreen instructions to type your new password.
 - To ignore it, simply press Enter.
6. The # prompt appears.
7. Type `config` and press Enter.
8. To configure network settings, type appropriate commands and press Enter. Refer to the following commands list. CLI commands are case sensitive.
9. After finishing the network settings, type `apply` to save changes. To abort, type `cancel`.

► Commands for wired networking:

The `<ipvX>` variable in the following commands is either `ipv4` or `ipv6`, depending on the type of IP protocol you are configuring. Replace the `<ETH>` variable with the word 'ethernet' when you are configuring the wired networking.

• General IP settings:

To set or enable	Use this command
IPv4 or IPv6 protocol	<pre>network <ipvX> interface <ETH> enabled <option></pre> <p><code><option></code> = <code>true</code>, or <code>false</code></p>

To set or enable	Use this command
IPv4 configuration method	<code>network ipv4 interface <ETH> configMethod <mode></code> <mode> = <i>dhcp</i> (default) or <i>static</i>
IPv6 configuration method	<code>network ipv6 interface <ETH> configMethod <mode></code> <mode> = <i>automatic</i> (default) or <i>static</i>
Preferred host name (optional)	<code>network <ipvX> interface <ETH> preferredHostName <name></code> <name> = preferred host name
IP address returned by the DNS server	<code>network dns resolverPreference <resolver></code> <resolver> = <i>preferV4</i> or <i>preferV6</i>

• **Static IP configuration:**

To set	Use this command
Static IPv4 or IPv6 address	<code>network <ipvX> interface <ETH> address <ip address></code> <ip address> = static IP address, with a syntax similar to the example below. Example: <i>192.168.7.9/24</i>
Static IPv4 or IPv6 gateway	<code>network <ipvX> gateway <ip address></code> <ip address> = gateway's IP address
IPv4 or IPv6 primary DNS server	<code>network dns firstServer <ip address></code> <ip address> = DNS server's IP address
IPv4 or IPv6 secondary DNS server	<code>network dns secondServer <ip address></code> <ip address> = DNS server's IP address
IPv4 or IPv6 third DNS server	<code>network dns thirdServer <ip address></code> <ip address> = DNS server's IP address

► **Commands for wireless networking:**

• **General wireless settings:**

To set or enable	Use this command
Wireless interface	<code>network wireless enabled <option></code> <option> = <i>true</i> , or <i>false</i>

To set or enable	Use this command
SSID	<code>network wireless SSID <ssid></code> <ssid> = SSID string
BSSID	<code>network wireless BSSID <bssid></code> <bssid> = AP MAC address or <i>none</i>
802.11n protocol	<code>network wireless enableHT <option></code> <option> = <i>true</i> , or <i>false</i>
Authentication method	<code>network wireless authMethod <method></code> <method> = <i>psk</i> or <i>eap</i>
PSK	<code>network wireless PSK <psk></code> <psk> = PSK string
EAP outer authentication	<code>network wireless eapOuterAuthentication <outer_auth></code> <outer_auth> = <i>PEAP</i>
EAP inner authentication	<code>network wireless eapInnerAuthentication <inner_auth></code> <inner_auth> = <i>MSCHAPv2</i>
EAP identity	<code>network wireless eapIdentity <identity></code> <identity> = your user name for EAP authentication
EAP password	<code>network wireless eapPassword</code> When prompted to enter the password for EAP authentication, type the password.
EAP CA certificate	<code>network wireless eapCACertificate</code> When prompted to enter the CA certificate, open the certificate with a text editor, copy and paste the content into the communications program.

The content to be copied from the CA certificate does NOT include the first line containing "BEGIN CERTIFICATE" and the final line containing "END CERTIFICATE." If a certificate is installed, configure the following:

Whether to	Use this command
Verify the certificate	<pre>network wireless enableCertVerification <option1></pre> <p><option1> = <i>true</i> or <i>false</i></p>
Accept an expired or not valid certificate	<pre>network wireless allowOffTimeRangeCerts <option2></pre> <p><option2> = <i>true</i> or <i>false</i></p>
Make the connection successful by ignoring the "incorrect" system time	<pre>network wireless allowConnectionWithIncorrectClock <option3></pre> <p><option3> = <i>true</i> or <i>false</i></p>

• **Wireless IPv4 / IPv6 settings:**

Commands for wireless IP settings are identical to those for wired networking. Just replace the variable <ETH> with the word 'wireless'. The following illustrates a few examples.

To set or enable	Use this command
IPv4 configuration method	<pre>network ipv4 interface WIRELESS configMethod <mode></pre> <p><mode> = <i>dhcp</i> (default) or <i>static</i></p>
IPv6 configuration method	<pre>network ipv6 interface WIRELESS configMethod <mode></pre> <p><mode> = <i>automatic</i> (default) or <i>static</i></p>

► **To verify network settings:**

After exiting the above configuration mode and the # prompt re-appears, type this command to verify all network settings.

- `show network`

Appendix B: Wireless Configuration

USB Wireless LAN Adapters

The PX3TS supports the following USB Wi-Fi LAN adapters.

Wi-Fi LAN adapters	Supported 802.11 protocols
SparkLAN WUBR-508N	A/B/G/N
Proxim Orinoco 8494	A/B/G
Zyxel NWD271N	B/G
Edimax EW-7722UnD	A/B/G/N

Wi-Fi LAN adapters	Supported 802.11 protocols
TP-Link TL-WDN3200 v1	A/B/G/N
Raritan USB WIFI	A/B/G/N

Note: To use the Edimax EW-7722UnD or Raritan USB WIFI wireless LAN adapter to connect to an 802.11n wireless network, the handshake timeout setting must be changed to 500 or greater, or the wireless connection will fail.

Supported Wireless LAN Configuration

If wireless networking is preferred, ensure that the wireless LAN configuration of your PX3TS matches the access point. The following is the wireless LAN configuration that the PX3TS supports.

- Network type: 802.11 A/B/G/N
- Protocol: WPA2 (RSN)
- Key management: WPA-PSK, or WPA-EAP with PEAP and MSCHAPv2 authentication
- Encryption: CCMP (AES)

Important: Supported 802.11 network protocols vary according to the wireless LAN adapter being used with the PX3TS. See *USB Wireless LAN Adapters* (on page 9).

Making a Wireless Connection

Make the PX3TS connect to a wireless network as needed.

► **To make a wireless connection:**

Do one of the following:

- Plug a supported USB wireless LAN adapter into the USB-A port on your PX3TS.
- Connect a USB hub to the USB-A port on the PX3TS. Then plug the supported USB wireless LAN adapter into the appropriate USB port on the hub.

See *USB Wireless LAN Adapters* (on page 9) for a list of supported wireless LAN adapters.

Appendix C: Other Information

Installing the USB-to-Serial Driver (Optional)

The PX3TS can emulate a USB-to-serial converter over a USB connection. A USB-to-serial driver named "Dominion PX2 Serial Console" is required for Microsoft® Windows® operating systems.

Download the Windows driver for USB serial console from the Raritan website's *Support page* (<http://www.raritan.com/support/>). The downloaded driver's

name is *dominion-serial-setup-<n>.exe*, where <n> represents the file's version number.

There are two ways to install this driver: automatic and manual installation. Automatic driver installation is highly recommended.

► Automatic driver installation in Windows®:

1. Make sure the PX3TS is NOT connected to the computer via a USB cable.
2. Run *dominion-serial-setup-<n>.exe* on the computer and follow online instructions to install the driver.

Note: If any Windows security warning appears, accept it to continue the installation.

3. Connect the PX3TS to the computer via a USB cable. The driver is automatically installed.

Note: Manual installation is required only if the automatic installation fails. See the section titled "Installing the USB-to-Serial Driver (Optional)" in the online help for manual installation procedure.

► In Linux:

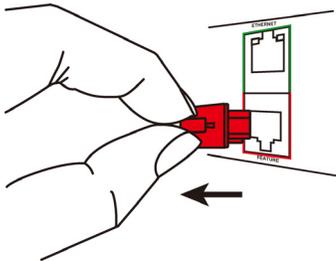
No additional drivers are required, but you must provide the name of the tty device, which can be found in the output of the "dmesg" after connecting the PX3TS to the computer. Usually the tty device is "/dev/ttyACM#" or "/dev/ttyUSB#," where # is an integer number.

For example, if you are using the kermit terminal program, and the tty device is "/dev/ttyACM0," perform the following commands:

```
> set line /dev/ttyACM0
> connect
```

RJ-45 Cap in the Feature Port

PX3TS models have a cap plugged into the FEATURE port when shipping out of the factory. The cap is intended to protect the port from connecting to inappropriate equipment. Remove it if needed.



Additional Information

For more information about PX3TS and the entire Raritan product line, see Raritan's website (www.raritan.com). For technical issues, contact Raritan Technical Support. See the

Contact Support page in the Support section on Raritan's website for technical support contact information worldwide.

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