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Owner's Manual

PDUMH15AT,PDUMH15ATNET
PDUMH20AT,PDUMH20ATNET

Switched/Metered Rack PDU with Automatic Transfer Switch

Tested To Comply With FCC Standards

1111 W. 35th Street • Chicago, IL 60609 USA
(773) 869-1234 • www.tripplite.com

1. Important Safety Instructions

SAVE THESE INSTRUCTIONS

This manual contains instructions and warnings that should be followed during the installation, operation, and storage of this product. Failure to heed these instructions and warnings will void the product warranty.

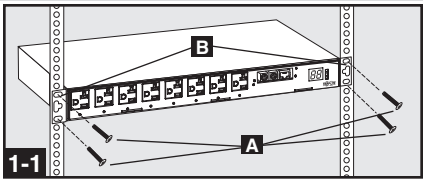
- The PDU provides convenient multiple outlets, but it DOES NOT provide surge or line noise protection for connected equipment.
- The PDU is designed for indoor use only in a controlled environment away from excess moisture, temperature extremes, conductive contaminants, dust or direct sunlight.
- Do not connect the PDU to an ungrounded outlet or to extension cords or adapters that eliminate the connection to ground.
- The power requirement for each piece of equipment connected to the PDU must not exceed the individual outlet's load rating.
- The total power requirement for equipment connected to the PDU must not exceed the maximum load rating for the PDU.
- Do not drill into or attempt to open any part of the PDU housing. There are no user-serviceable parts inside.
- Do not attempt to modify the PDU, including the input plugs and power cables.
- Do not attempt to use the PDU if any part of it becomes damaged.
- Do not attempt to mount the PDU to an insecure or unstable surface.
- Never attempt to install electrical equipment during a thunderstorm.
- Use of this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety or effectiveness is not recommended. Do not use this equipment in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.

2. Installation

2.1 Mounting the PDU

The PDU supports 1U Rack configurations.

Note: The user must determine the fitness of hardware and procedures before mounting. The PDU and included hardware are designed for common rack and rack enclosure types and may not be appropriate for all applications. Exact mounting configurations may vary.

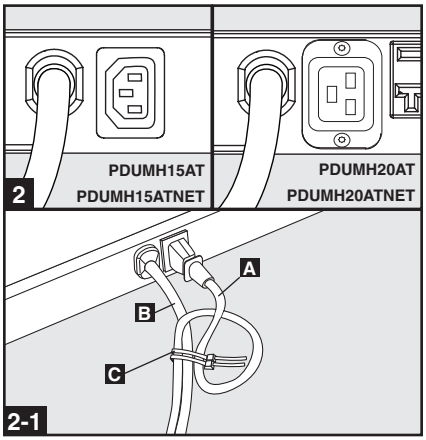


1-1 1U Rack Mounting: Attach the PDU to the rack by inserting four user-supplied screws **A** through the PDU mounting brackets **B** and into the mounting holes of the rack rail as shown.

2.2 Connecting the PDU

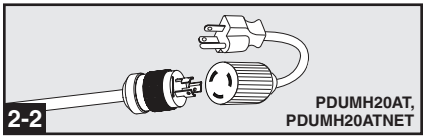
The PDU includes two AC power inputs: Primary and Secondary. The Primary input cord is permanently attached to the rear of the PDU.

The Secondary input cord is detachable and connects to the IEC power inlet **2** at the rear of the PDU (PDUMH15AT,PDUMH15ATNET - IEC-320-C14 inlet; PDUMH20AT, PDUMH20ATNET - IEC-320-C20 inlet).

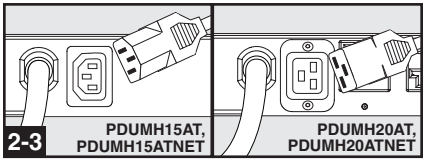


2-1 To connect the Secondary input cord:

1. Form a loop in the Secondary cord **A** and secure the juncture of that loop to the Primary cord **B** with a zip tie. Be sure the zip tie is secured around the Secondary and Primary cords, as well as through the loop created in the Secondary cord **C**. (See diagram). ***Note:*** *Give the cord as much slack as possible between the loop and the cord's outlet.*
2. Once you've secured the two cords together and ensured that the Secondary cord has a comfortable amount of slack, insert the Secondary cord outlet into the IEC power inlet.



2-2 Connect Input Plug Adapters (Optional - Models PDUMH20AT, PDUMH20ATNET Only): The PDU includes two adapters that convert one or both of the L5-20P input plugs to 5-20P input plugs. Connecting the adapters is optional. The PDU will function normally without connecting the adapters.



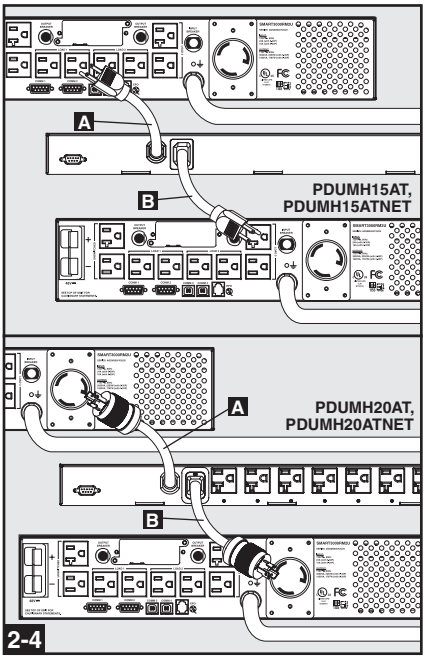
2-3 Connect Secondary Input Cord to PDU: Although the PDU will operate without connecting the Secondary input cord, the Secondary input is required for the PDU's Automatic Transfer Switch function.

2. Installation *(continued)*

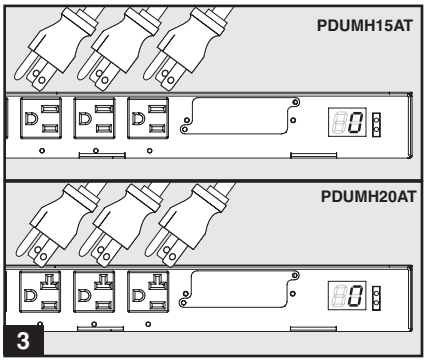
2.2 Connecting the PDU *(continued)*

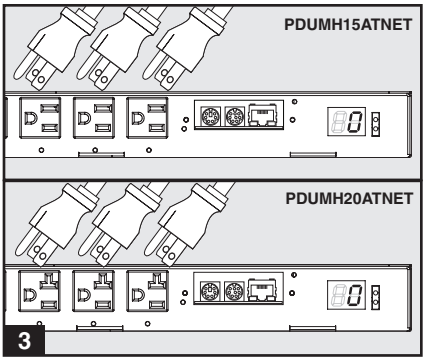
2-4 Connect PDU Input Plugs: (See the *Configuration and Operation* section for more information.) Connect the Primary input plug **A** to a preferred source of grounded 120V AC power, such as a SmartOnline™ UPS System. The UPS system must not share a circuit with a heavy electrical load (such as an air conditioner or refrigerator). Under normal operating conditions, the PDU will distribute AC power from the Primary input source. Connect the Secondary input plug **B** to an alternative source of grounded 120V AC power, such as a redundant SmartOnline UPS System. The UPS system must not share a circuit with a heavy electrical load (such as an air conditioner or refrigerator). Do not plug the Secondary input into the same power source as the Primary input. The PDU will distribute AC power from the Secondary input only if the Primary input becomes unavailable.

Note: *Immediately after the PDU is connected to live AC power, you may notice a series of soft clicking sounds emitted by electrical relays within the PDU. The relays may also click occasionally during the operation of the PDU. This is normal.*



3 Connect Equipment to PDU: Do not exceed the load rating of the PDU. The total electrical current used by the PDU will be displayed on the digital meter in amperes. Each outlet includes a green LED that illuminates when the outlet is receiving AC power.





2.3 Networking the PDU **(Only Applicable to Models with SNMP Network Card Installed)**

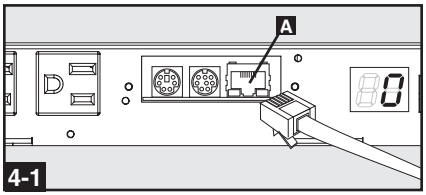
Note: The MAC address of the PDU (a 12-digit string in this format: 000667xxxxxx) is printed on a label attached to the PDU enclosure. The MAC address is also printed on a label attached to the internal network card.

If your network's DHCP server will assign a dynamic IP address to the PDU automatically, go to Step **4-1**. If you will assign a static IP address to the PDU manually, go to Step **5-1**. If you are uncertain which method to use, contact your network administrator for assistance before continuing the installation process.

2. Installation *(continued)*

2.3.1 Dynamic IP Address Assignment

4-1 Connect PDU to Network: While the PDU is powered, connect a standard Ethernet patch cable to the RJ-45 Ethernet port **A** on the PDU. *Note: This port is not compatible with PoE (Power over Ethernet) applications.* The PDU will attempt to obtain an IP address via DHCP. This may take as long as several minutes, depending on your network environment.



4-2 Discover IP Address: Contact your network administrator to determine which dynamic IP address has been assigned to the PDU by the DHCP server. The PDU can be identified on the DHCP server by referring to its MAC address. (The MAC address is a 12-digit string in this format: 000667xxxxxx. Refer to the MAC address label attached to the PDU.) You may wish to request a long-term lease period for the IP address, depending on your application. After you have discovered the IP address, skip Steps **5-1** through **5-6** and proceed directly to Step **6-1**.

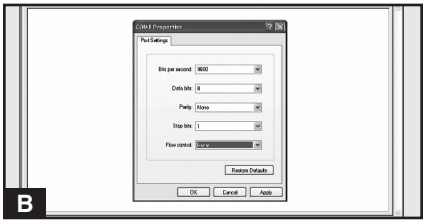
2.3.2 Static IP Address Assignment

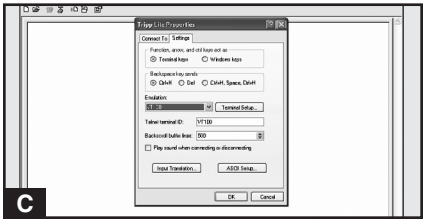
5-1 Determine IP Information: Before assigning a static IP address, you'll need to know the IP address, gateway address and subnet mask. If you do not have this information, contact your network administrator for assistance.

5-2 Configure Terminal Emulation Program: Open a VT100-compatible terminal emulation program (such as the HyperTerminal program bundled with Microsoft® Windows®) on a computer with an available DB9 serial port. (A notebook computer may be the most convenient choice.) Set the terminal emulation program to use the COM port **A** that corresponds to the computer's DB9 serial port. Specify the parameters **B** required to communicate with the PDU terminal interface:

Bits per second:	9600
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	None

If the terminal emulation program supports multiple emulation modes, you may also need to specify VT100 emulation **C**.





2. Installation *(continued)*

2.3 Networking the PDU *(continued)*

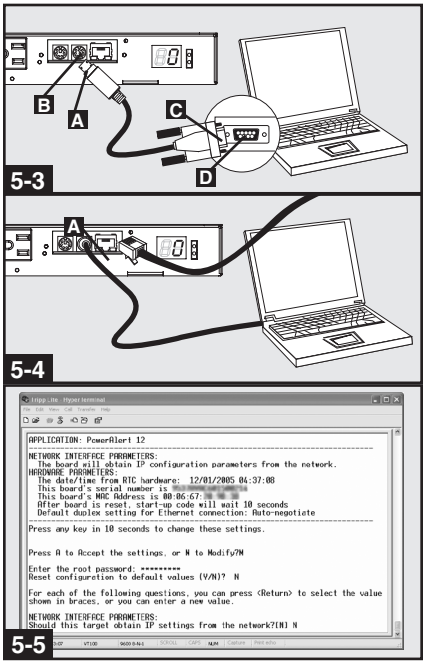
2.3.2 Static IP Address Assignment *(continued)*

5-3 Connect PDU to Computer: Use the mini-DIN to DB9 serial cable (part number 73-1025) included with the PDU to connect the PDU to the computer. The circular connector **A** at one end of the cable attaches to the 8-pin mini-DIN serial port **B** on the PDU. (Align the connector carefully to avoid damaging the pins.) The DB9 connector **C** at the other end of the cable connects to the computer's serial port **D**.

5-4 Connect PDU to Network: While the PDU is powered, connect a standard Ethernet patch cable to the RJ-45 Ethernet port **A** on the PDU. *Note: This port is not compatible with PoE (Power over Ethernet) applications.*

5-5 Configure PDU in Terminal Mode: After a brief pause, an initialization page should appear in the terminal emulation program. Press any key on the keyboard within 10 seconds to change the PDU settings. (If the 10-second period has elapsed, you can reboot the PDU by powering down completely and then restoring power.)

Follow the sequence of responses below in order to assign an IP address to the PDU. The default terminal mode root password is *TrippLite*. Sample IP settings are shown - supply your own IP information when you configure your PDU.



Press A to Accept the settings, or M to Modify? **M**

Enter the root password: *************
Reset configuration to default values (Y/N)? **N**

For each of the following questions, you can press <Return> to select the value shown in braces, or you can enter a new value.

NETWORK INTERFACE PARAMETERS:
Should this target obtain IP settings from the network?[N] **N**
Static IP address [192.168.1.19]? **192.168.0.123**
  Static IP address is 192.168.0.123
Subnet Mask IP address [255.255.0.0]? **255.255.255.0**
  Subnet Mask IP address is 255.255.255.0
Gateway address IP address [192.168.1.1]? **192.168.0.1**
  Gateway address IP address is 192.168.0.1

You can also change the root password, real-time clock and other settings. (Tripp Lite recommends against changing the default settings unless you are an advanced user with a specific purpose.) After you have finished entering settings, the PDU will save changes to memory and reboot (this may take several minutes). After the PDU reboots, the initialization page should display the new static IP settings.

5-6 Remove Serial Cable: Remove the serial cable from the PDU and proceed to Step **6-1**.

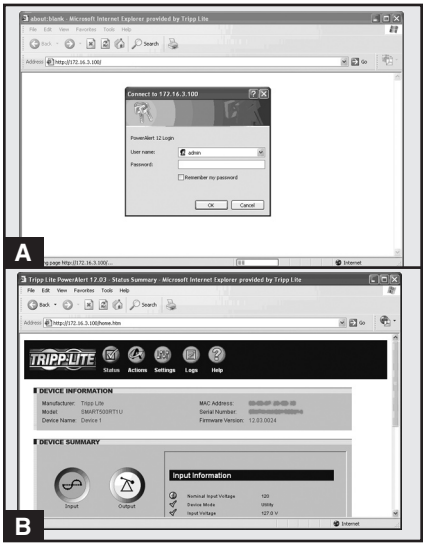
2. Installation *(continued)*

2.3 Networking the PDU *(continued)*

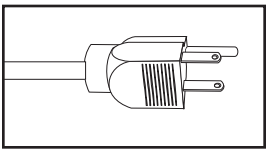
2.3.3 Testing Network Connection

6-1 Access PDU with Web Browser: After an IP address has been assigned to the PDU, attempt to access it with a Web browser that supports frames, forms and Java™. Open a Web browser on a computer connected to the LAN and enter the IP address assigned to the PDU. You should be prompted for a password **A**. The user name is *admin* and the default password is *admin*. After you enter the user name and password, the PowerAlert *Status* page **B** will appear in the browser window. For more information about configuration and operation of the PDU via the PowerAlert interface, refer to the SNMPWEBCARD User's Guide, included on the CD-ROM bundled with the PDU.

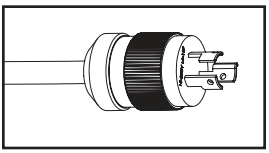
Note for Network Management System Users Only: *Two MIB files - Tripplite.mib and RFC1628.mib - must be loaded on each Network Management Station that will monitor the PDU via SNMP. The files are provided on the CD-ROM included in the product package.*



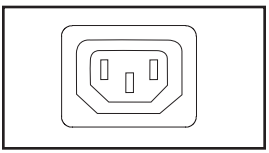
3. Features



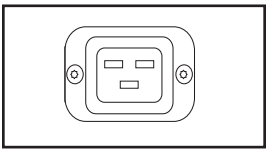
Primary AC Input Power Cord (Model PDUMH15AT/15ATNET): The cord is permanently attached to the PDU and has a NEMA 5-15P plug.



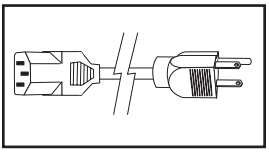
Primary AC Input Power Cord (Model PDUMH20AT/20ATNET): The cord is permanently attached to the PDU and has a NEMA L5-20P plug.



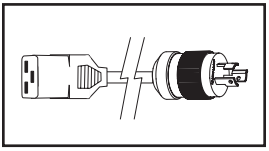
Secondary AC Input Power Inlet (Model PDUMH15AT/15ATNET): The IEC-320-C14 inlet connects to the detachable Secondary AC Input Power Cord.



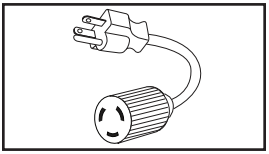
Secondary AC Input Power Inlet (Model PDUMH20AT/20ATNET): The IEC-320-C20 inlet connects to the detachable Secondary AC Input Power Cord.



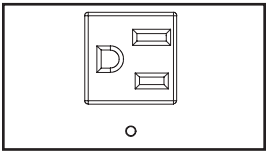
Secondary AC Input Power Cord (Model PDUMH15AT/15ATNET): The detachable cord has an IEC-320-C13 connector and a NEMA 5-15P plug.



Secondary AC Input Power Cord (Model PDUMH20AT/20ATNET): The detachable cord has an IEC-320-C19 connector and a NEMA L5-20P plug.

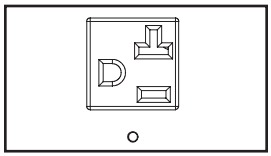


Input Plug Adapters (Model PDUMH20AT/20ATNET): The adapters convert NEMA L5-20P input plugs to NEMA 5-20P input plugs.

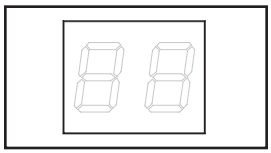


NEMA 5-15R Outlets (Model PDUMH15AT/15ATNET): During normal operation, the outlets distribute AC power to connected equipment. When an outlet is live, the associated LED illuminates.

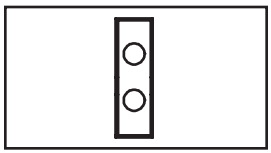
3. Features *(continued)*



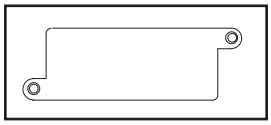
NEMA 5-15/20R Outlets (Model PDUMH20AT/20ATNET): During normal operation, the outlets distribute AC power to connected equipment. When an outlet is live, the associated LED illuminates.



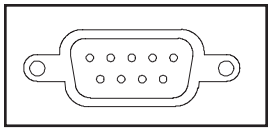
Digital Load Meter (Ammeter): The total electrical current used by the PDU is displayed on the digital meter in amperes.



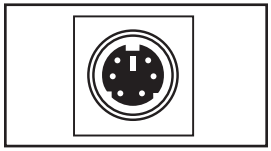
Input Source Indicator: When the PDU is connected to a live AC power source, the Primary or Secondary input LED illuminates to indicate which source is supplying power to the PDU outlets.



Accessory Slot: An optional SNMP card may be installed in the slot, allowing the PDU to be configured, controlled and monitored remotely. Contact Tripp Lite Customer Support at (773) 869-1234 for more information.

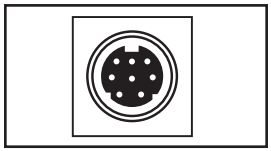


Factory Port: The port is reserved for configuration by factory authorized personnel only. Do not connect anything to the port.

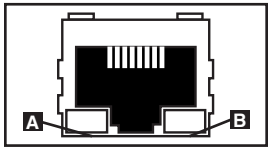


For Models with SNMP Network Card Installed:

PS/2 Port: Use this port to connect a Tripp Lite ENVIROSENSE environmental sensor to provide remote temperature/humidity monitoring and a dry contact interface to control and monitor alarm, security and telecom devices. Contact Tripp Lite Customer Support at (773) 869-1234 for ordering information. Note: Do not connect a keyboard or mouse to this port.



Mini-DIN Serial Port: Use this port to provide a direct terminal connection to a computer with a terminal emulation program. A serial cable (part number 73-1025) is included with the PDU. If you need to order a replacement cable, contact Tripp Lite Customer Support at (773) 869-1234.



Ethernet Port: Use this RJ-45 jack to connect the PDU to the network with a standard Ethernet patch cable. The Link LED **A** and Status LED **B** indicate several operating conditions, as shown in the table below. *This port is not compatible with PoE (Power Over Ethernet) applications.*

Network Operating Conditions			
A Link LED Color		**B Status LED Color**	
Off	No Network Connection	Off	Card Not Initialized
Flashing Amber	100 Mbps Network Connection	Steady Green	Card Initialized and Operational
Flashing Green	10 Mbps Network Connection	Flashing Amber	Error - Card Not Initialized

4. Configuration and Operation

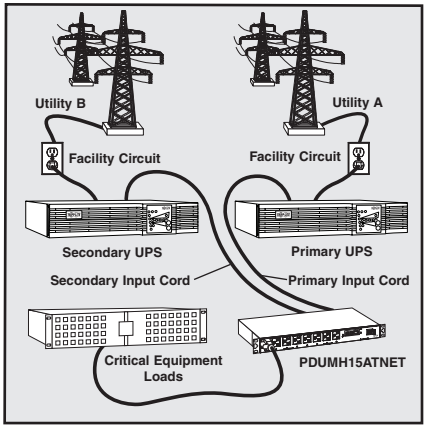
4.1 Automatic Transfer Switch

When the Primary and Secondary inputs are both connected to Tripp Lite UPS Systems, the PDU operates as an Automatic Transfer Switch, providing redundant input power for high availability applications. Under normal operating conditions, the PDU will distribute power from the Primary input source, switching to the Secondary input source under certain conditions. The PDU will switch to the Primary source whenever it is *Good* according to the PDU input voltage definitions (see below).

4.1.1 Preferred Configuration

The Automatic Transfer Switch function provides increased availability when the Primary and Secondary inputs of the PDU are connected to separate Tripp Lite UPS Systems that are connected to separate utility power sources. For maximum availability, Tripp Lite recommends using matching SmartOnline UPS Systems with pure sine wave output for the Primary and Secondary input power sources. The automatic transfer switch function will be compromised if the primary and secondary inputs are connected to the same utility power source.

Warning: DO NOT connect the primary input to a line-interactive UPS, due to transfer time issues, or to any source that does not supply a pure sine wave. Such sources may be used to power the secondary input.



4.1.2 Automatic Transfer Switch Source Selection

Upon power-up, the PDU looks for a source ≥85V. If it is unable to find a source ≥85V, it remains off.

Input voltage definitions:	
99V ≤ V_{in} < 139V	*Good*
75V ≤ V_{in} < 99V	*Fair*
V_{in} < 75V	*Bad*

In normal operation (after power-up), if the selected source is no longer *Good*, the PDU will attempt to switch to the other source, but only if the other source is *Good*. If the selected source becomes Fair and the other source is not *Good*, the PDU will keep the loads connected to the selected source until the selected source becomes *Bad*, at which point the loads will be disconnected (note that the source selection doesn't change). After the loads are disconnected, they remain disconnected until the selected source becomes ≥85V, or until the other source becomes *Good*.

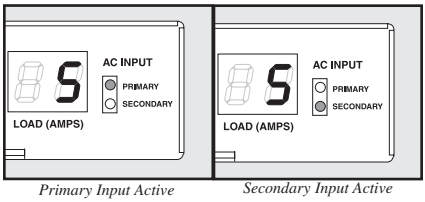
4. Configuration and Operation *(continued)*

4.1 Automatic Transfer Switch *(continued)*

4.1.3 Quick Test

After installing the PDU and connecting equipment, you may test the Automatic Transfer Switch function by temporarily shutting down the UPS system connected to the Primary AC input. When the Primary input UPS is no longer supplying AC power, the PDU will switch from the Primary input to the Secondary input, and the Secondary input LED will illuminate. When the Primary input UPS has been restarted and resumes supplying AC power, the PDU will switch back to the Primary input.

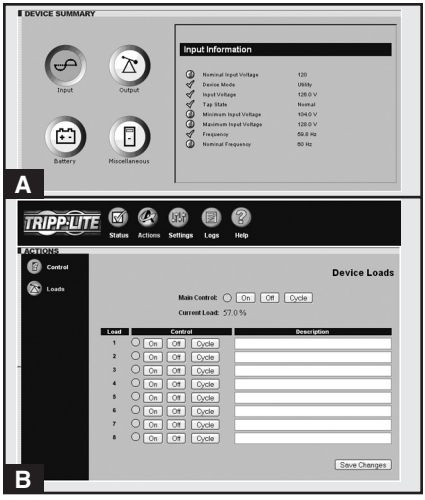
Note: *The primary and secondary inputs must be connected to separate sources of utility power. The automatic transfer switch function will be compromised if the primary and secondary inputs are connected to the same utility power source. Do not perform a test with equipment that must remain in productive operation. Any test procedure must prepare for the contingency that the equipment may lose power. Do not test the PDU by detaching power cords which are connected to live power sources, as this eliminates the connection to ground and places your equipment at risk.*



Primary Input Active *Secondary Input Active*

4.2 Remote Monitoring and Control

The PDU provides remote monitoring **A**, outlet control **B** and more via Web browser, telnet and SNMP-based Network Management Systems. For more information about configuration and operation of the PDU via the PowerAlert Web browser interface, refer to the SNMPWEBCARD User's Guide, included on the CD-ROM bundled with the PDU.



5. Technical Support

Telephone: (773) 869-1233
8:00 AM - 6:00 PM CST Monday - Thursday
8:00 AM - 5:30 PM CST Friday
(CST is Central Standard Time in the United States.)

E-mail: techsupport@tripplite.com

6. Warranty and Warranty Registration

LIMITED WARRANTY

Seller warrants this product, if used in accordance with all applicable instructions, to be free from original defects in material and workmanship for a period of 2 years (except internal UPS system batteries outside USA and Canada, 1 year) from the date of initial purchase. If the product should prove defective in material or workmanship within that period, Seller will repair or replace the product, in its sole discretion. Service under this Warranty can only be obtained by your delivering or shipping the product (with all shipping or delivery charges prepaid) to: Tripp Lite, 1111 W. 35th Street, Chicago, IL 60609 USA. Seller will pay return shipping charges. Call Tripp Lite Customer Service at (773) 869-1234 before sending any equipment back for repair.

THIS WARRANTY DOES NOT APPLY TO NORMAL WEAR OR TO DAMAGE RESULTING FROM ACCIDENT, MISUSE, ABUSE OR NEGLECT. SELLER MAKES NO EXPRESS WARRANTIES OTHER THAN THE WARRANTY EXPRESSLY SET FORTH HEREIN. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ALL IMPLIED WARRANTIES, INCLUDING ALL WARRANTIES OF MERCHANTABILITY OR FITNESS, ARE LIMITED IN DURATION TO THE WARRANTY PERIOD SET FORTH ABOVE; AND THIS WARRANTY EXPRESSLY EXCLUDES ALL INCIDENTAL AND CONSEQUENTIAL DAMAGES. (Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights, and you may have other rights which vary from jurisdiction to jurisdiction).

WARNING: The individual user should take care to determine prior to use whether this device is suitable, adequate or safe for the use intended. Since individual applications are subject to great variation, the manufacturer makes no representation or warranty as to the suitability or fitness of these devices for any specific application.

WARRANTY REGISTRATION

Visit www.tripplite.com/warranty today to register the warranty for your new Tripp Lite product. You'll be automatically entered into a drawing for a chance to win a FREE Tripp Lite product!*

* No purchase necessary. Void where prohibited. Some restrictions apply. See website for details.

FCC Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. The user must use shielded cables and connectors with this product. Any changes or modifications to this product not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Regulatory Compliance Identification Numbers

For the purpose of regulatory compliance certifications and identification, your Tripp Lite product has been assigned a unique series number. The series number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to the series number. The series number should not be confused with the marking name or model number of the product.

The policy of Tripp Lite is one of continuous improvement. Specifications are subject to change without notice.

Made in China.