

**Eaton® User's Guide
for Basic, Monitored, and Switched ePDU™
164202115**



Powering Business Worldwide

**Eaton® User's Guide
for Basic, Monitored, and Switched ePDU™
164202115**



Powering Business Worldwide

Eaton is a registered trademark and ePDU is a trademark of Eaton Corporation or its subsidiaries and affiliates. HyperTerminal is a registered trademark of Hilgraeve, Inc. JavaScript is a trademark of Sun Microsystems, Inc. Procomm Plus and pcAnywhere are trademarks of Symantec Corporation. All other trademarks are property of their respective companies.

©Copyright 2009 Eaton Corporation, Raleigh, NC, USA. All rights reserved. No part of this document may be reproduced in any way without the express written approval of Eaton Corporation.

Special Symbols

The following are examples of symbols used on the ePDU or accessories to alert you to important information:



RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.



CAUTION: REFER TO OPERATOR'S MANUAL - Refer to your operator's manual for additional information, such as important operating and maintenance instructions.



This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

Table of Contents

1	Introduction	1
	Basic	1
	Monitored	1
	Switched	1
	Features	2
	Safety Warnings	3
Section I – Basic ePDU		
2	Basic ePDU Operation	3
	Accessories	3
	Operation Features	3
Section II – Monitored ePDU		
3	Monitored ePDU Operation	7
	Ethernet (RJ-45)	8
	Display Panel	8
	Specifications	8
	ePDU Remote Current Meter Setup Guide	9
	Description	9
	Hardware Setup	9
	Configuration and Control via Network Connection	9
	Instructions	9
4	Three-Phase Load Balancing	11
5	Monitored ePDU Web Interface	13
	Hardware Setup	13
	Configuration and Control via Network Connection	13
	Default Settings:	13
	Web Interface	13
	Readings	14
	Configuration	15
	Basic Settings	15
	Network Settings	16
	Current Alarm Settings	16
	Temperature Alarm Settings	17
	SNMP Interface	17
	MIB	17
Section III – Switched ePDU		
6	Switched ePDU Operation	21
	Accessories	21
	Operation Features	21
7	Switched ePDU Initial Configuration	27
	Hardware Setup	27

Configuration Using a Serial (RS-232) Connection	27
Configuration Through the Network Connection	31
Accessing the Web Interface	31
Telnet Interface	33
SNMP Interface	33
8 Switched ePDU Admin Using Serial or Telnet	35
About the Serial and Telnet Interfaces	35
Setting Terminal Width	37
Main Menu	38
Outlet Control Menu	38
Outlet-Environmental Configuration Main Menu	40
Outlet Configuration	40
Outlet Groups	42
Auto Scheduler	43
Outlet Startup Mode	45
Environmental Settings	45
Temperature Sensor Setup	46
Humidity Sensor Setup	47
Contact Closure Switch Setup	48
Voltage/Current Threshold Setup	49
Display Sensor Measurements	50
Display Power Log / VA Measurements	50
Unit Configuration Main Menu	50
Unit Configuration Submenu	51
Network Settings	52
SNMP Menus	54
User Manager	56
Log Manager	57
View Log/Alert Submenu	58
Administrative Utilities	60
Update Firmware	60
Show Firmware Version	61
Set System Defaults	61
Outlet-Environmental Status	62
Outlet Section	62
Environmental Sensors	63
Choose Strapping Device	63
9 Switched ePDU Admin Using the Web Interface	65
Unit Status	65
Power Log	66
Outlet Control	67
Group Control	68
Outlet Configuration	69
Group Configuration	71
Scheduler Configuration	72
Environmental Configuration	73
Temperature and Humidity Settings	73
Contact Switch Settings	75
Voltage and Current Settings	76

Unit Configuration	77
Network Configuration	79
User Configuration	82
Log Configuration	83
Select Strapping Unit	85
10 Switched ePDU Admin Using the SNMP Interface	87
11 Switched ePDU Advanced Features	89
Strapping	89
Advanced Boot Configuration	91
Contact Sensor Wiring	94
Recovering From a Lost Password	95
12 Service and Support	97
13 Warranty	99

List of Figures

Figure 1. Physical Features Vertical Mount Shown) Typical	3
Figure 2. Physical Features (Rack Mount Type Shown) Typical	4
Figure 3. Monitored ePDU Display Panel (Model PW105MI1U165 Shown)	7
Figure 4. Display Panel	8
Figure 5. 30A Three-Phase System Example	11
Figure 6. ePDU Status Window (Typical)	14
Figure 7. ePDU Configuration Window (Typical)	15
Figure 8. ePDU Configuration continued (Typical)	16
Figure 9. 30A Three-Phase System Example	21
Figure 10. Physical Features (Model PW306SWOU156 Shown)	23
Figure 11. Circuit Breakers (Model PW105SWOU154 Shown)	25
Figure 12. Login Prompt (Typical)	31
Figure 13. Unit Status Page (Typical)	32
Figure 14. HyperTerminal Properties and Terminal Settings Windows (Typical)	37
Figure 15. Unit Status Page (Home Page) (Typical)	65
Figure 16. Power Log Page (Typical)	66
Figure 17. Outlet Control Page (Typical)	67
Figure 18. Group Control Page (Typical)	68
Figure 19. Outlet Configuration Page (Typical)	69
Figure 20. Group Configuration Page (Typical)	71
Figure 21. Scheduler Page (Typical)	72
Figure 22. Environmental Configuration (Typical)	73
Figure 23. Unit Configuration Page (Typical)	77
Figure 24. Network Configuration Page (Typical)	79
Figure 25. User Configuration Page (Typical)	82
Figure 26. Log Configuration Page (Typical)	83
Figure 27. Select Strapping Unit Page (Typical)	85
Figure 28. Strapping Ports (Typical)	89
Figure 29. Pin Position and Color Code	94

This page intentionally left blank.

Chapter 1

Introduction

The standard Eaton ePDU comes in three variations: Basic, Monitored, and Switched. The purpose of these units is to distribute utility power within your equipment racks and with the Monitored and Switched units, allow you to monitor and control various aspects of the ePDU's operation.

Control and monitoring is accomplished through direct and network monitoring. The user has the ability to log into the unit's network interface or the optional Eaton Intelligent Power Manager software and fully observe and control aspects such as individual connection usage for current, voltage, and temperature (model dependent). It also allows remote control to turn on or off of each connector, thus allowing total control of equipment whenever and from wherever necessary.

Basic

The Basic ePDU is a single or three phase supply unit with power input provided through an attached plug and cable. It is available in either vertical mount or rack mounted styles. Various factory-supplied brackets are available to adapt the unit to virtually any location or equipment mounting location.

The Basic ePDU provides reliable and cost effective power distribution.

Monitored

The Eaton® Monitored ePDU is designed to distribute power within a rack. Providing outstanding performance and reliability, the Monitored ePDU's unique benefits include:

- Remote monitoring of the current draw for individual circuits through an Ethernet port (RJ-45)
- Easy-read digital LED ammeter for easy start-up and configuration



NOTE *MI model numbers indicate Ethernet capability. Models with Ethernet capability provide network access through Internet Protocol (IP).*

NOTE *For mounting instructions and model-specific information, refer to the ePDU catalog or go to www.epdu.com.*

You can use a supplied Cat 5 Ethernet patch cable for network communication, either as a crossover cable to connect directly to a computer, or as a straight-through cable to connect to a local area network (LAN).

Switched

The Eaton® Switched ePDU™ is an intelligent power distribution unit that provides distribution of AC power to controlled devices. The Switched ePDU provides high quality yet simplified remote power control of up to 36 AC line receptacles (up to 576 outlets in strapping mode).

The Switched ePDUs are designed as a valuable tool for network managers who can now prevent costly site visits to reboot locked-up computers and networking equipment. Switched ePDUs can be controlled from a local terminal or over an Ethernet (TCP/IP) network using a Telnet client, a Web browser, or Simple Network Management Protocol (SNMP) software.

With a computer connected to a network of Switched ePDUs, users have a complete process control system. The Switched ePDU can be used to control systems such as conveyor lines, factory processes, robotics, TV/CATV antenna systems, pipeline valves, pumping stations, computers, peripherals, drives, printers, communications equipment, environmental equipment, refrigerators, and medical equipment.

Features

All models and configurations of the Switched ePDU provide the following features:

- Power control through a Web browser, Telnet, serial, or SNMP user interface
- Auto-scheduled events
- Local and remote current monitoring
- Outlet grouping and naming
- User-defined power up/down sequence
- User accounts
- E-mail notification of events
- SNMP traps
- Environment-dependent outlet control
- Power log
- User-upgradeable firmware
- Strapping of up to 24 Switched
 - Up to 576 outlets can be controlled through one interface. For more information, see “Strapping” on page 89.
- Three switch closure inputs
- Optional temperature and humidity monitoring (with optional accessory probe)



NOTE For mounting instructions and model-specific information, refer to the ePDU catalog or go to www.epdu.com.

Safety Warnings

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

This manual contains important instructions that you should follow during installation and operation of the ePDU. Please read all instructions before operating the equipment and save this manual for future reference.

DANGER



This ePDU contains **LETHAL VOLTAGES**. All repairs and service should be performed by **AUTHORIZED SERVICE PERSONNEL ONLY**. There are **NO USER SERVICEABLE PARTS** inside the ePDU.

CAUTION



- To reduce the risk of fire or electric shock, install this ePDU in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Ambient temperature must not exceed 45°C (113°F). Do not operate near water or excessive humidity (95% maximum).
- To comply with international standards and wiring regulations, the total equipment connected to the output of this ePDU must not have an earth leakage current greater than 3.5 milliamperes.
- For PERMANENTLY CONNECTED EQUIPMENT, a readily accessible disconnect device shall be incorporated in the building installation wiring.
- For PLUGGABLE EQUIPMENT, the power outlet shall be installed near the equipment and shall be readily accessible.

Consignes de sécurité

CONSIGNES DE SÉCURITÉ IMPORTANTES CONSERVER CES INSTRUCTIONS

Ce manuel contient des instructions importantes que vous êtes invité à suivre lors de toute procédure d'installation et de fonctionnement de la ePDU. Veuillez consulter entièrement ces instructions avant de faire fonctionner l'équipement et conserver ce manuel afin de pouvoir vous y reporter ultérieurement.

DANGER!



Cet ePDU contient des TENSIONS MORTELLES. Toute opération d'entretien et de réparation doit être **EXCLUSIVEMENT CONFIEE A UN PERSONNEL QUALIFIE AGRÉÉ**. AUCUNE PIÈCE RÉPARABLE PAR L'UTILISATEUR ne se trouve dans la ePDU.

ATTENTION!



- Pour réduire les risques d'incendie et de décharge électrique, installer la ePDU uniquement à l'intérieur, dans un lieu dépourvu de matériaux conducteurs, où la température et l'humidité ambiantes sont contrôlées. La température ambiante ne doit pas dépasser 45 °C. Ne pas utiliser à proximité d'eau ou dans une atmosphère excessivement humide (95 % maximum).
- Afin d'être conforme aux normes et règlements internationaux de câblage, le courant de fuite à la terre de la totalité du matériel branché sur la sortie de la ePDU ne doit pas dépasser 3,5 mA.
- Afin de CONNECTER DE MANIÈRE PERMANENTE L'ÉQUIPEMENT, un dispositif de déconnexion aisément accessible doit être incorporé au câblage d'installation du bâtiment.
- En ce qui concerne l'ÉQUIPEMENT ENFICHABLE, la prise d'alimentation doit être installée près de l'équipement et doit être facile d'accès.

Sicherheitswarnungen

WICHTIGE SICHERHEITSANWEISUNGEN AUFBEWAREN

Dieses Handbuch enthält wichtige Hinweise, welche Sie bei der Installation und Wartung des ePDU beachten sollten. Bitte lesen Sie alle Anweisungen des Handbuches bevor Sie mit dem Gerät arbeiten. Bewahren Sie das Handbuch zum Nachlesen auf.



WARNUNG

Die ePDU führt lebensgefährliche Spannungen. Alle Reparatur- und Wartungsarbeiten sollten nur von Kundendienstfachleuten durchgeführt werden. Die ePDU enthält keine vom Benutzer zu wartenden Komponenten.



VORSICHT!

- Um die Brand- oder Elektroschockgefahr zu verringern, diese ePDU nur in Gebäuden mit kontrollierter Temperatur und Luftfeuchtigkeit installieren, in denen keine leitenden Schmutzstoffe vorhanden sind. Die Umgebungstemperatur darf 45 °C nicht übersteigen. Die ePDU nicht in der Nähe von Wasser oder in extrem hoher Luftfeuchtigkeit (max. 95 %) betreiben.
 - Um internationale Normen und Verdrahtungsvorschriften zu erfüllen, dürfen die an den Ausgang dieser ePDU angeschlossenen Geräte zusammen einen Erdableitstrom von insgesamt 3,5 Milliampere nicht überschreiten.
 - Für PERMANENT ANGESCHLOSSENE GERÄTE: In der Gebäudeverkabelung muss eine leicht zugängliche Trennvorrichtung enthalten sein.
 - Für GERÄTE MIT STECKERN: Die Steckdose muss sich in der Nähe des Geräts befinden und leicht zugänglich sein.
-

Advertencias de Seguridad

INSTRUCCIONES DE SEGURIDAD IMPORTANTES GUARDE ESTAS INSTRUCCIONES

Este manual contiene instrucciones importantes que debe seguir durante la instalación y el funcionamiento de la ePDU. Por favor, lea todas las instrucciones antes de poner en funcionamiento el equipo y guarde este manual para referencia en el futuro.



PELIGRO

Este ePDU contiene VOLTAJES MORTALES. Todas las reparaciones y el servicio técnico deben ser efectuados SOLAMENTE POR PERSONAL DE SERVICIO TÉCNICO AUTORIZADO. No hay NINGUNA PARTE QUE EL USUARIO PUEDA REPARAR dentro de la ePDU.



PRECAUCIÓN

- Para reducir el riesgo de incendio o de choque eléctrico, instale este ePDU en un lugar cubierto, con temperatura y humedad controladas, libre de contaminantes conductores. La temperatura ambiente no debe exceder los 45°C. No trabaje cerca del agua o con humedad excesiva (95% máximo).
- Para cumplir con los estándares internacionales y las normas de instalación, la totalidad de los equipos conectados a la salida de este ePDU no debe tener una intensidad de pérdida a tierra superior a los 3,5 miliamperios.
- Para EQUIPO CONECTADO PERMANENTEMENTE, se debe incorporar un dispositivo de desconexión fácilmente accesible al cableado de la instalación del edificio.
- Para EQUIPO ENCHUFABLE, la salida de alimentación debe estar instalada cerca del equipo y estar fácilmente accesible.

This page intentionally left blank.

Section I

Basic ePDU

Chapter 2

Basic ePDU Operation

This chapter provides the Basic ePDU accessories and explains the operation features.

Accessories

There are no accessories available for the Basic ePDU:

Operation Features

See Figure 1 and Figure 2 for Basic ePDU features. Figure 11 and Table 1 describe the circuit breaker.



NOTE *Circuits breakers are not available on all Basic ePDU models.*

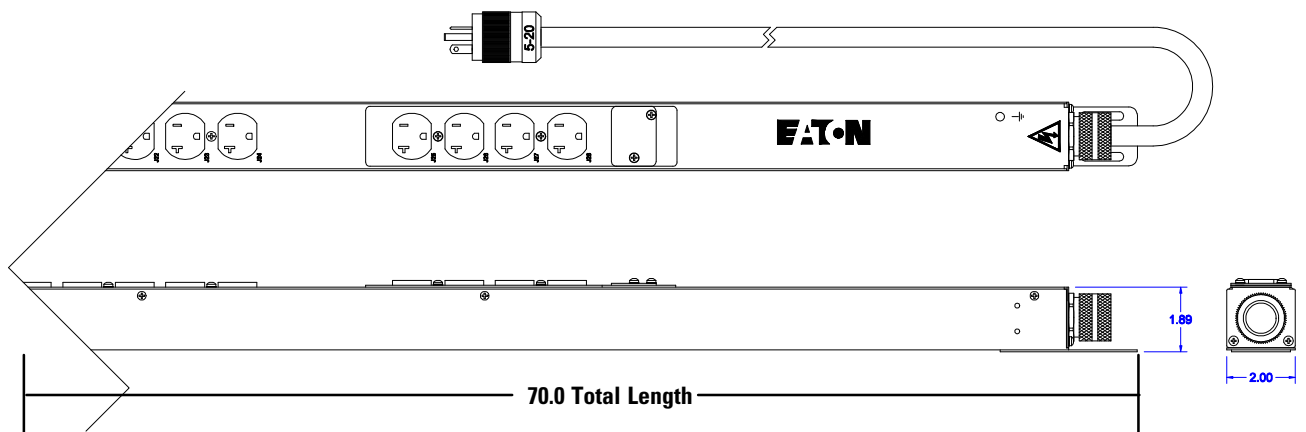


Figure 1. Physical Features Vertical Mount Shown) Typical

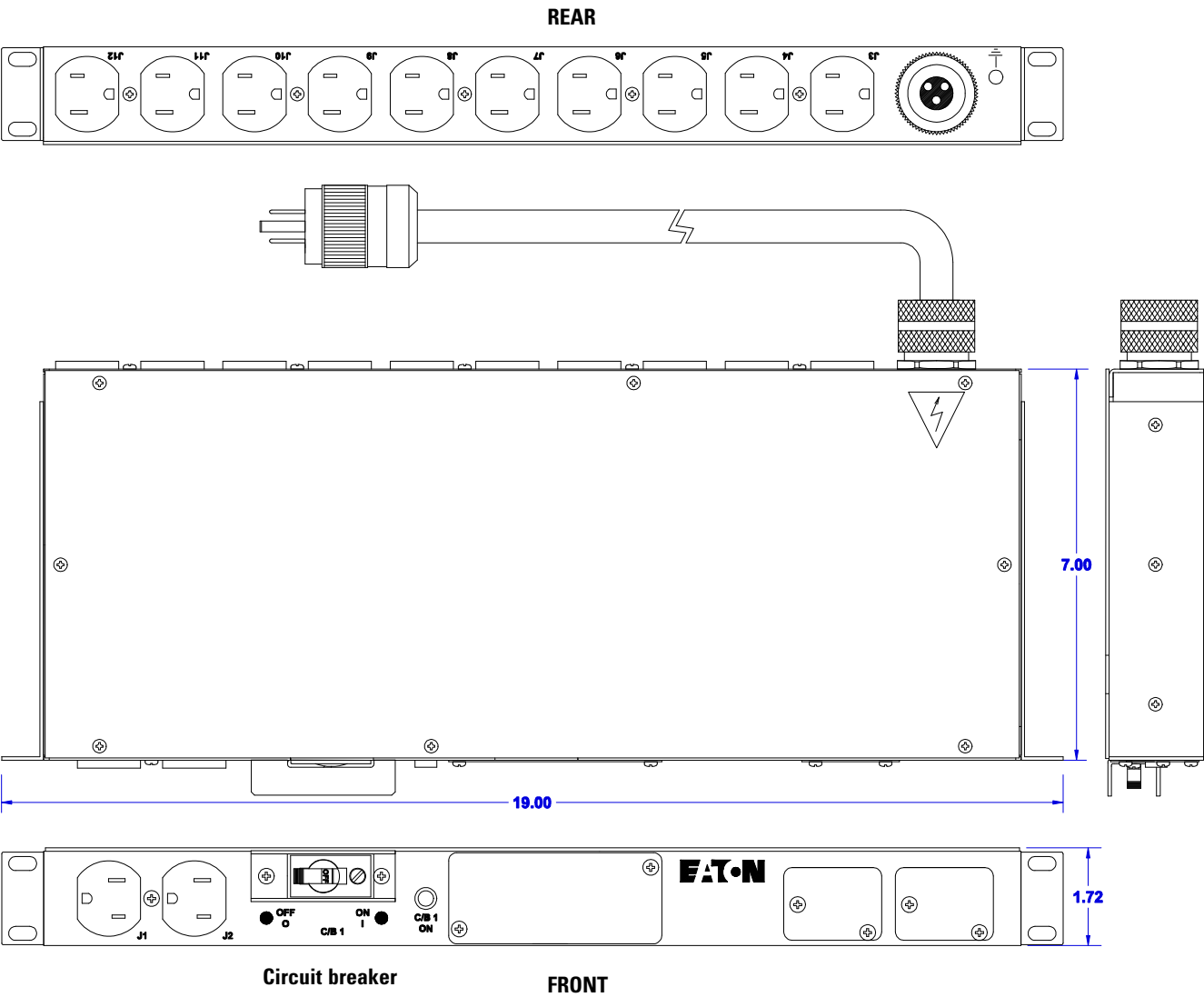


Figure 2. Physical Features (Rack Mount Type Shown) Typical

Table 1. Circuit Breakers		
Item	Feature	Description
1.	Magnetic Resettable Circuit Breakers	Basic ePDUs with 16 outlets have circuit breakers.
2.	Circuit Breaker LED	Illuminates blue when the circuit breaker is on.

Section II

Monitored ePDU

Chapter 3

Monitored ePDU Operation

This chapter explains how to use the Monitored ePDU. It describes the Ethernet port (RJ-45) on the front of the Monitored ePDU and how to use the display panel. See Figure 3 for Monitored ePDU features.

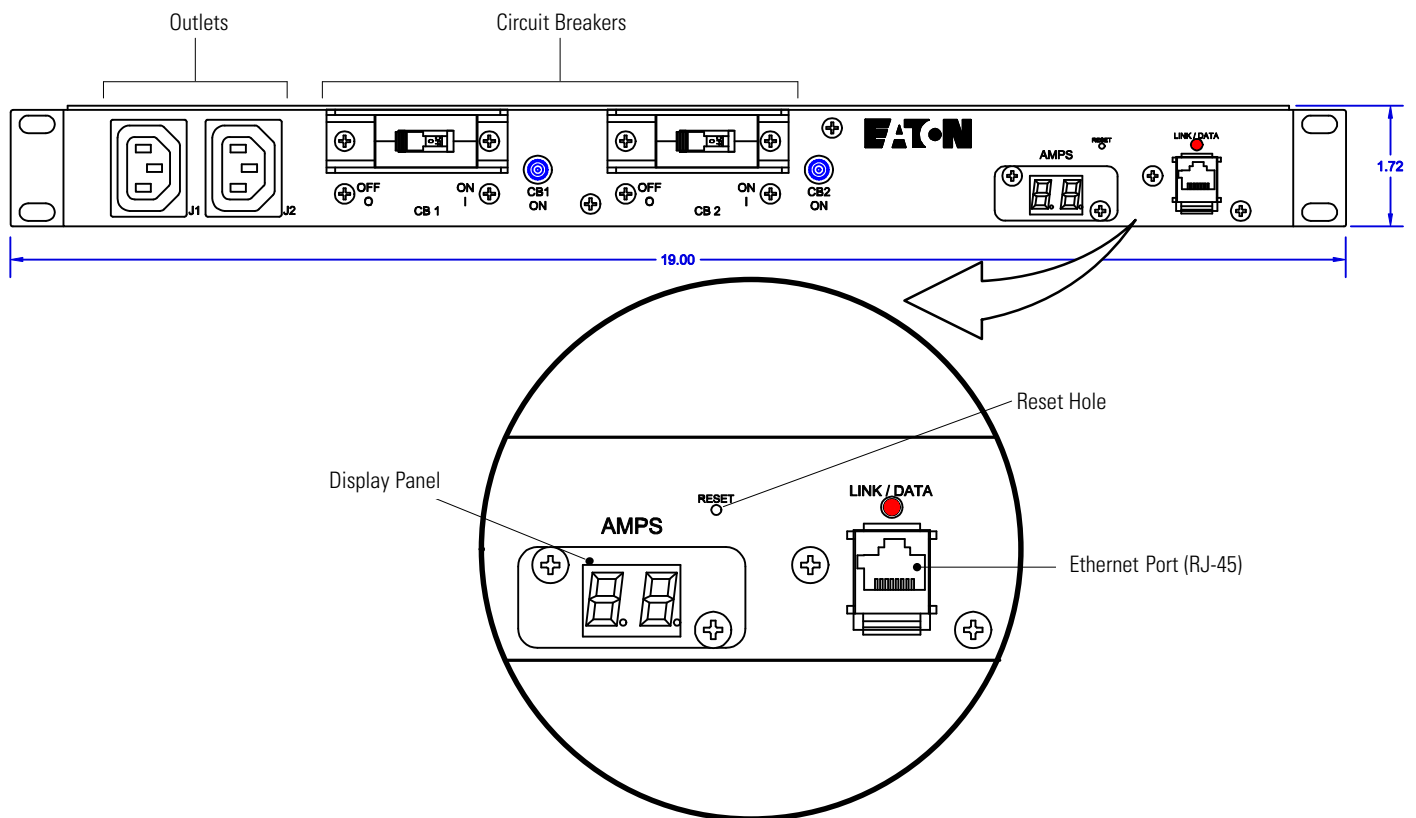


Figure 3. Monitored ePDU Display Panel (Model PW105MI1U165 Shown)

Ethernet (RJ-45)

To connect to a local network, use a customer-supplied RJ-45 straight-through patch cable. Use the Ethernet port (RJ-45) to connect the ammeter for remote reporting of the ammeter-measured values

Display Panel

The display panel is near the outlets on the Monitored ePDU (see Figure 4).

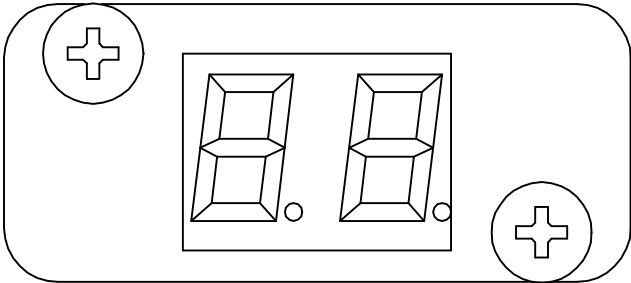


Figure 4. Display Panel

The ammeter can measure up to eight channels depending on the configuration and specification of the ePDU. The ammeter is factory-configured to display the number of circuits that are monitored for that particular model.

The ammeter measures load current in the power distribution circuit using current transformers (CTs). The load current is measured without directly interfering with the integrity of the power supply circuit.



NOTE See Chapter 4, “Three-Phase ePDU Local Display,” for information on the relationship between input and output load currents in a three-phase ePDU.

Specifications

Table 2 provides environmental specifications for all Monitored ePDUs.

Table 2. Environmental Specifications (All Monitored ePDU Models)

Operating Temperature	0°C to 50°C (32°F to 113°F)
Nonoperating Temperature	-25°C to 70°C (-13°F to 158°F)
Relative Humidity	5–95% noncondensing
Operating Altitude	Up to 3,000m (9,843 ft) above sea level
Nonoperating Altitude	Up to 5,000m (16,404 ft) above sea level

ePDU Remote Current Meter Setup Guide

Description

The current meter included in this product has both a local LED display and an RJ45 network interface. The local meter display rotates among all of the current channels and uses a descriptor, “Cn” (where *C* is the channel number and *n* is the section number), to indicate which channel is to be displayed next. The network interface provides current monitoring capability via a web interface, and email alerts and SNMP traps can be sent when the unit exceeds customizable thresholds.

Hardware Setup

1. To use the network interface, connect a standard Ethernet cable (included) from the RJ45 connector labeled NET on the top of the unit to an available port on a network switch.
2. Connect the power input to an appropriate source.

Configuration and Control via Network Connection



NOTE The unit comes with a default IP address of 192.168.168.168. If you are unable to connect to the unit via the network connection with this default address, it will be necessary to use a configuration program from Eaton engineering before using any of the network interfaces. To obtain this program, please contact technical support at (800) 870-2248.

Default Settings

IP Address: 192.168.168.168

Gateway: 192.168.168.1

Username: **Admin**

Password: **etn**

Instructions

1. Using any web browser, navigate to the remote current meter's IP address (<http://192.168.168.168/>).
2. A Readings screen will appear that shows all of the available current and temperature readings for the unit. Click on Refresh to update the screen.
3. To enter configuration mode, click on Configuration on the left-hand side of the screen. A prompt will appear asking for the username and password; the default user name is **Admin**, and the default password is **etn**.
4. A Configuration screen will appear that shows all of the available options for the unit, including network settings. After changing any parameters, press the Update Settings button to save changes, wait about five seconds, then press the Click Here link to return to the Readings screen.

This page intentionally left blank.

Chapter 4

Three-Phase Load Balancing

This chapter explains the relationship between input and output load currents in a three-phase Monitored ePDU. This information applies to any three-phase Monitored ePDU. See Figure 5 for an example of a 30A three-phase system.

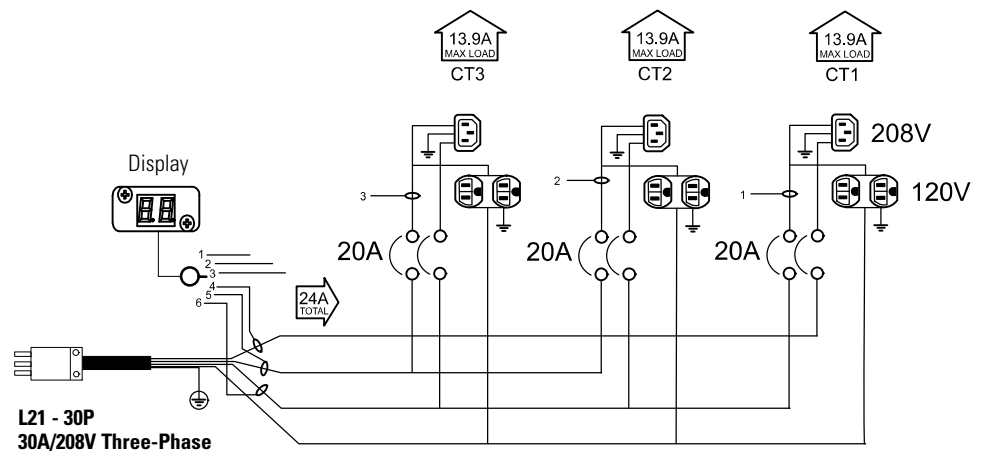


Figure 5. 30A Three-Phase System Example

The three-phase input voltage is 208V phase-to-phase and 120V phase-to-neutral.

Figure 5 shows two types of outlets:

- **IEC 320-C13 outlets.** These outlets are connected across phase-to-phase and provide 208V to the supplied equipment.
- **NEMA 5-15 outlets.** These outlets are connected phase-to-neutral and provide 120V to the supplied equipment.



CAUTION

- The current limit values defined for the ePDU output circuits should be observed (13.9A shown in Figure 5) to prevent input overload. The input load current limits for the supply must be observed to prevent the risk of overload to the supply circuit breaker (4, 5, and 6, with a 24A limit shown in Figure 5).
- Failure to observe these limits may cause loss of power because the circuit breaker will open when overloaded.

The output branch circuits are protected by a 20A rated branch circuit breaker (UL489) in line with the National Electrical Code® (NEC®) requirements and the maximum design load of each output circuit (if not limited by other factors) would be 16A (80% rated).

If the applied load uses the IEC 320-C13 outlets, each input phase wire is connected to two output circuits (as shown in Figure 5). The value of the input phase current is therefore the sum of the two output circuit currents. However, the value is not a simple sum because the load currents of the two output circuits are not in phase with each other. The sum of the current is a function of three-phase electrical circuits, where the input phase current is $1.73 \times$ the output current. For example, 1A on each output circuit results in 1.73A on each input phase.

If the applied load uses the NEMA 5-15 outlet, it is connected between just one phase and neutral. As a result, the output current drawn through this outlet is only drawn through one input phase and the input equals the output. While this connection is simple if considered alone, mixed outlet types on the ePDU causes complicated relationships that are difficult to calculate.

To solve this problem and provide optimal management of equipment and power supply, the Monitored ePDU provides ammeter monitoring at both the input and the output. Equipment loads should be evenly distributed across the outputs by monitoring the output load current values (see **1**, **2**, and **3** in Figure 5).

Chapter 5

Monitored ePDU Web Interface

This chapter explains:

- Hardware connection
- Configuring Internet protocol settings to access the user interface
- Displaying ampere readings of the current transformers
- Configuring Monitored ePDU parameters

Hardware Setup

To use the network interface, connect a standard Ethernet cable (included) from the RJ45 connector labeled NET on the top of the unit (see Figure 3) to an available port on a network switch.

Connect the power input to an appropriate electrical source.

Configuration and Control via Network Connection

Default Settings:

IP Address: 192.168.168.100
Gateway: 192.168.168.1
User Name: Admin
Password: etn

1. Using your favorite web browser, navigate to the remote current meter's IP address (e.g., <http://192.168.168.100>)
2. A READINGS screen will appear that shows all of the available current and temperature readings for the unit. Click on Refresh to update the screen.
3. To enter configuration mode, click on Configuration on the left-hand side off the screen. A prompt will appear asking for the user name and password. Enter the information from the list above.
4. A CONFIGURATION screen will appear that shows all of the available options for the unit, including network settings. After changing any parameters, press the SAVE SETTINGS button (Figure 8) to save the changes, wait about 5 seconds, then press the CLICK HERE link to return to the READINGS screen.

Web Interface

The web interface uses graphical navigation to view channel status, temperature readings, and to change configuration. To open a web connection to this unit, follow the instructions in the previous section. The left panel displays two accessible web pages and the log off option.

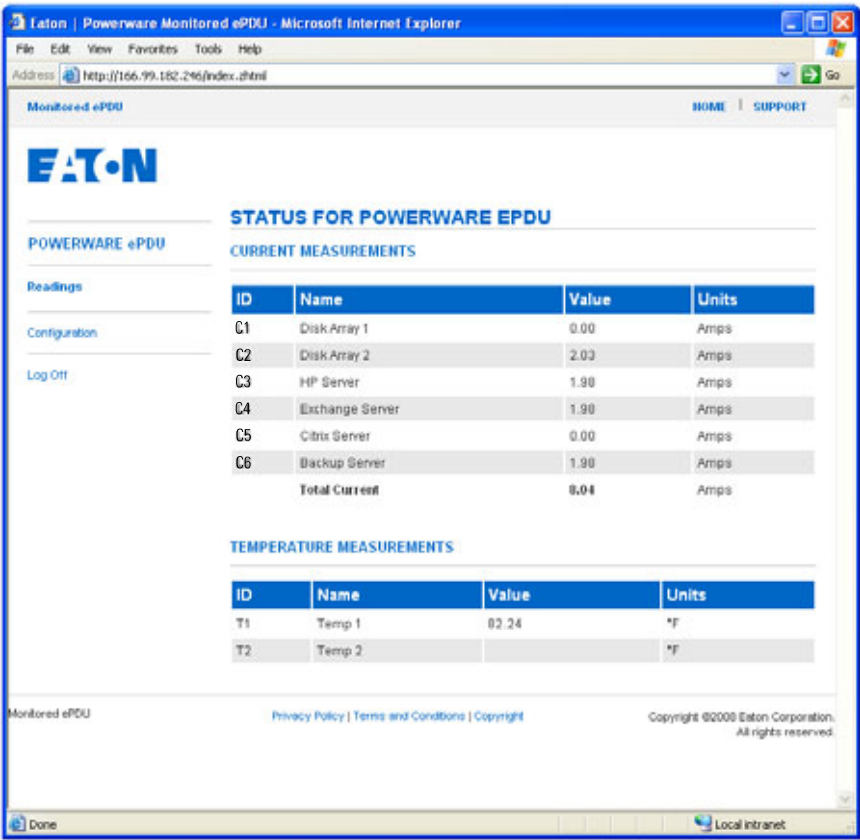


Figure 6. ePDU Status Window (Typical)

Readings

The READINGS screen presents the current readings of the unit and functions as the Home screen. This screen is displayed immediately after a user logs in.

CURRENT MEASUREMENTS: This field displays the names of each channel. The values show how much current is being drawn by each channel. The number of channels in this field varies because different models have a different number of channels.

TEMPERATURE MEASUREMENT: This value is displayed when Temperature Alarm Settings in the configuration page is enabled. Accessory probes can be purchased from Eaton.



NOTE If a temperature sensor is enabled in the software but a sensor is not physically installed and/or connected, a default temperature of >200°F or <20°F will be displayed.

Accessory	Description
SENSOR-T1-10	Temperature Sensor with 10 ft cable (1)
SENSOR-T2-10	Temperature 1 and Temperature 2 Sensors on 10 ft cable with Y adapter
SENSOR-T1H1-10	Temperature and humidity sensor with 10 ft cable
SENSOR-T2H1-10	Temperature 1 and Humidity sensor on 10 ft cable with Y adapter + Temperature 2 sensor with 10ft cable

Configuration

CONFIGURATION FOR POWERWARE EPDU

BASIC SETTINGS

Unit Name: Powerware ePDU

Asset ID:

User Name: Admin

Password: ***

Firmware: SUB-PMC-2500 1.0.E

NETWORK SETTINGS

* IP Address: 166.99.182.246

* Net Mask: 255.255.255.0

* Gateway: 166.99.182.250

Mac Address: 00:50:c2:5a:b0:00

Alarm Trap Destination IP: 166.99.182.146

Mail server IP: 161.110.126.206

Alarm E-Mail Address: user@eaton.com

Note: If the settings marked with (*) are changed, the ePDU will reboot after pressing the Save Settings button.

Figure 7. ePDU Configuration Window (Typical)

After any changes are made, the Save Settings (Figure 8) button at the bottom of the page must be pressed for any changes to take effect. If the web interface is closed without pressing this button, all changes will be lost. If settings with an asterisk (*) are changed, the ePDU will reboot after pressing the Save Settings button (Figure 8). The user will have to reconnect to the unit after about 15 seconds.

Basic Settings

Unit Name: Up to 19 characters may be used to name the unit.

Asset ID: Up to 31 characters may be used to designate the unit asset ID.

User Name: Up to 19 characters may be used. The default user name is Admin and it is case sensitive. The user name may be operator changed and used to login. A soft reboot is required for the name change to take effect.

Password: Up to 19 characters may be used. The default password is **etn** and it is case sensitive. The password may be operator changed and used to login. A soft reboot is required for the password change to take effect.

Network Settings

Unit IP Address: This value should be entered in standard dot notation (e.g., 192.168.168.168)

Net mask: This value should be entered in standard dot notation (e.g., 255.255.255.0) It requires a soft reboot to take effect.

Gateway: This value should be entered in standard dot notation (e.g., 192.168.168.1) It requires a soft reboot to take effect.

Mac Address: This value is unique to each unit and cannot be changed.

Alarm Trap Destination IP: This value should be entered in standard dot notation (e.g., 192.168.168.100)

Mail Server IP: This value should be entered in standard dot notation (e.g., 192.168.168.1). All email will be sent via the server using the SNMP protocol.

Alarm E-Mail Address: Up to 31 characters may be used to specify an email address for all logs



NOTE Both the Mail Server IP and Email address are required for email messages to be sent.

Figure 8. ePDU Configuration continued (Typical)

Current Alarm Settings

Each current measurement can be configured to have both lower and upper current thresholds. Each values corresponds to the sum of currents measured in the 6-outlet set. The current threshold is measured in Amps. The range for the threshold value is from 0 to 100.

Names: Up to 31 characters can be used to set names for each channel.

Upper Threshold: Whenever the reading rises above the upper threshold, email alerts and/or SNMP traps may be sent depending on the Network Settings under Configuration.

Lower Threshold: Whenever the reading falls below the lower threshold, email alerts and/or SNMP traps may be sent depending on the Network Settings under Configuration.

Temperature Alarm Settings

Each temperature measurement can be configured to have both lower and upper thresholds. The temperature measurement is -20 to 100 Fahrenheit.

Names: Up to 31 characters can be used to set names for each temperature probe.

Enabled: A sensor must be enabled before readings can be displayed. If no temperature probe is connected to a unit, the temperature settings function should be disabled to prevent sending unintended traps and/or emails and showing inaccurate numbers on the READINGS page.

Upper Threshold: Whenever the reading rises above the upper threshold, email alerts and/or SNMP traps may be sent depending on the Network Settings under Configuration.

Lower Threshold: Whenever the reading falls below the lower threshold, email alerts and/or SNMP traps may be sent depending on the Network Settings under Configuration.

SNMP Interface

This unit's SNMP interface conforms to version 1.0 of the SNMP protocol. To use this interface, the unit must first have valid network settings and be accessible from the web interface for setup purposes. A management information base (MIB) file for this unit should also be downloaded from www.ePDU.com.

SNMP is enabled by default. SNMP traps may also be configured from the Network Configuration menu.

MIB

Click the MIB (Management Information Base) tab to display the management data of the Monitored ePDU that is used by an SNMP client to monitor the current over a network.

To download the MIB:

1. Click the MIB icon.
2. Select **Save to Disk**.
3. Select a location for the file.

The MIB can then be loaded into the SNMP client.

This page intentionally left blank.

Section III

Switched ePDU

Chapter 6

Switched ePDU Operation

This chapter provides the environmental specifications, lists available Switched ePDU accessories, and explains the operation features.

Accessories

The following accessories are available for the Switched ePDU:

Accessory	Description
SENSOR-T1-10	One Temperature Sensor with 10 ft cable (1)
SENSOR-T2-10	Two Temperature Sensors on 10 ft cable with Y adapter
SENSOR-T1H1-10	One Temperature and one humidity sensor with 10 ft cable
SENSOR-T2H1-10	One Temperature and one Humidity sensor on 10 ft cable with Y adapter + additional Temperature sensor with 10ft cable

Operation Features

See Figure 10 and Table 3 for Switched ePDU features. Figure 11 and Table 4 describe the circuit breakers.



NOTE Circuits breakers are not available on all Switched ePDU models.

This section explains the relationship between input and output load currents in a three-phase Switched ePDU. This information applies to any three-phase Switched ePDU. See Figure 9 for an example of a 30A three-phase system.

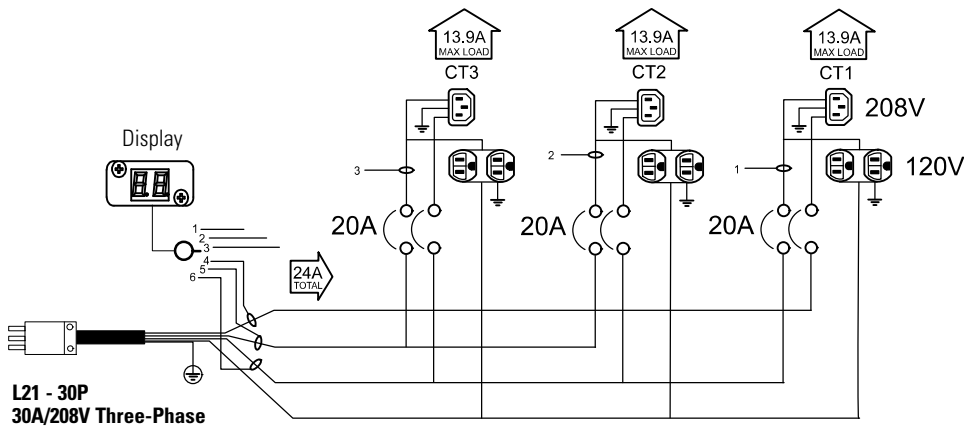


Figure 9. 30A Three-Phase System Example

The three-phase input voltage is 208V phase-to-phase and 120V phase-to-neutral.

Figure 9 shows two types of outlets:

- **IEC 320-C13 outlets.** These outlets are connected across phase-to-phase and provide 208V to the supplied equipment.
- **NEMA 5-15 outlets.** These outlets are connected phase-to-neutral and provide 120V to the supplied equipment.

**CAUTION**

- The current limit values defined for the ePDU output circuits should be observed (13.9A shown in Figure 9) to prevent input overload. The input load current limits for the supply must be observed to prevent the risk of overload to the supply circuit breaker (4, 5, and 6, with a 24A limit shown in Figure 9).
- Failure to observe these limits may cause loss of power because the circuit breaker will open when overloaded.

The output branch circuits are protected by a 20A rated branch circuit breaker (UL489) in line with the National Electrical Code® (NEC®) requirements and the maximum design load of each output circuit (if not limited by other factors) would be 16A (80% rated).

If the applied load uses the IEC 320-C13 outlets, each input phase wire is connected to two output circuits (as shown in Figure 9). The value of the input phase current is therefore the sum of the two output circuit currents. However, the value is not a simple sum because the load currents of the two output circuits are not in phase with each other. The sum of the current is a function of three-phase electrical circuits, where the input phase current is $1.73 \times$ the output current. For example, 1A on each output circuit results in 1.73A on each input phase.

If the applied load uses the NEMA 5-15 outlet, it is connected between just one phase and neutral. As a result, the output current drawn through this outlet is only drawn through one input phase and the input equals the output. While this connection is simple if considered alone, mixed outlet types on the ePDU causes complicated relationships that are difficult to calculate.

To solve this problem and provide optimal management of equipment and power supply, the Switched ePDU provides ammeter monitoring at both the input and the output. Equipment loads should be evenly distributed across the outputs by monitoring the output load current values (see **1**, **2**, and **3** in Figure 9).

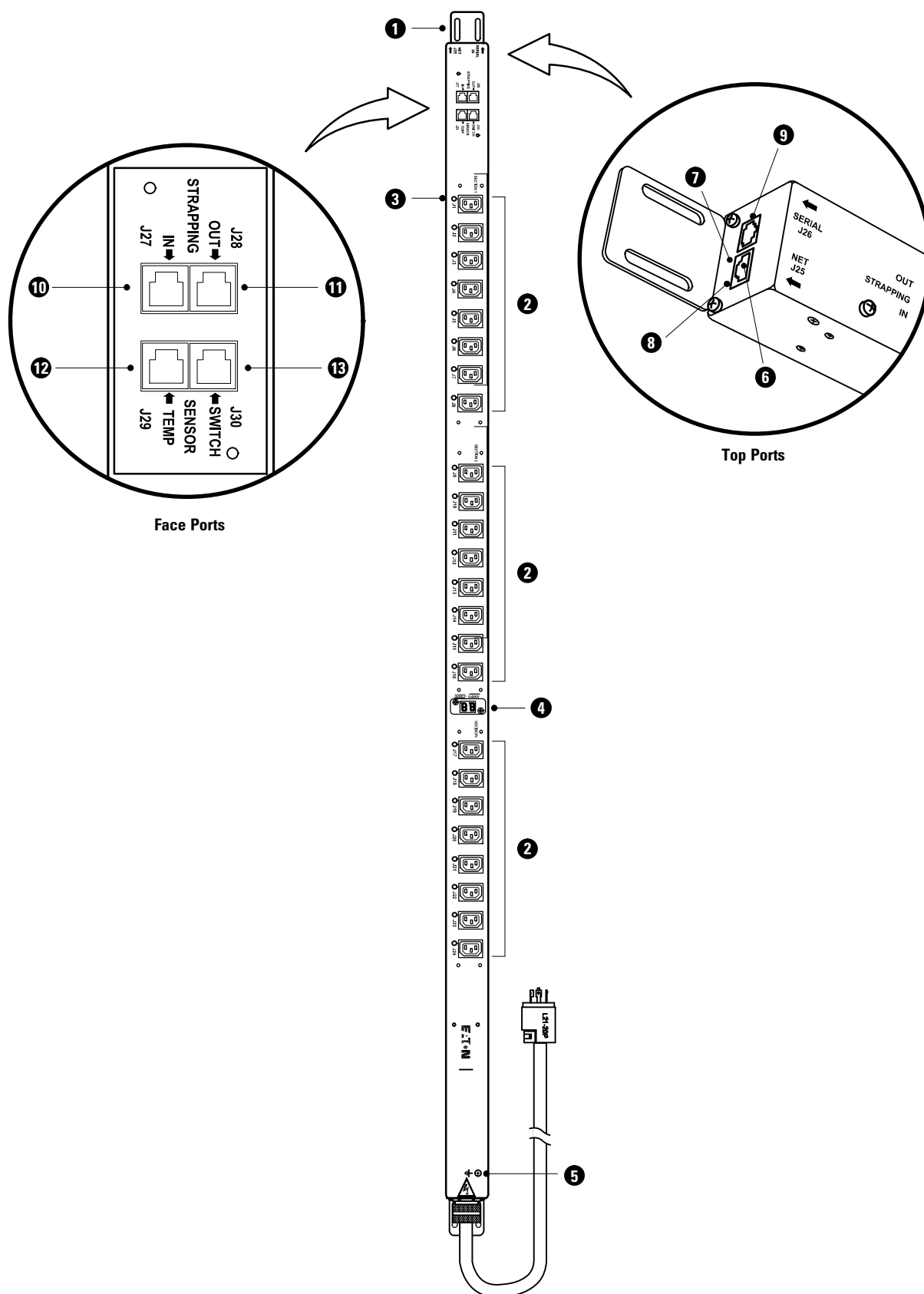


Table 3. Switched ePDU Features

Item	Feature	Description
1.	Detachable Mounting Brackets	Factory-supplied brackets.
2.	AC Power Receptacles	Switched ePDU outlets. Models are available with 8, 16, or 24 IEC C13 or NEMA 5-15R receptacles.
3.	Outlet LED (one per outlet)	LED is green when outlet is on.
4.	Load Current Display	Alternates every four seconds to display the current for each outlet section (single-phase ePDUs) or phase (three-phase ePDUs) depending on model.
5.	Ground (8-32 chassis nut)	For ground connection.
6.	Ethernet RJ-45 Port (J25)	Use the factory-supplied Ethernet cable to connect to a network.
7.	Ethernet Data LED	LED blinks orange when Ethernet traffic is present.
8.	Ethernet Link LED	LED is green when Ethernet connection is good.
9.	Serial RJ-12 Port (J26)	Use the factory-supplied adapter cable to convert to a standard DB-9.
10.	Strapping RJ-45 In Port (J27)	For directly connecting one Switched ePDU to another Switched ePDU (see “Strapping” on page 89). NOTE Not intended for Ethernet connection.
11.	Strapping RJ-45 Out Port (J28)	For directly connecting one Switched ePDU to another Switched ePDU (see “Strapping” on page 89). NOTE Not intended for Ethernet connection.
12.	Temperature/Humidity Sensor RJ-45 Port (J29)	Supports two temperature inputs and one humidity input (see “Accessories” on page 21 for more information).
13.	Contact Sensor RJ-45 Port (J30)	For connecting to external sensors, see “Contact Sensor Wiring” on page 94 .

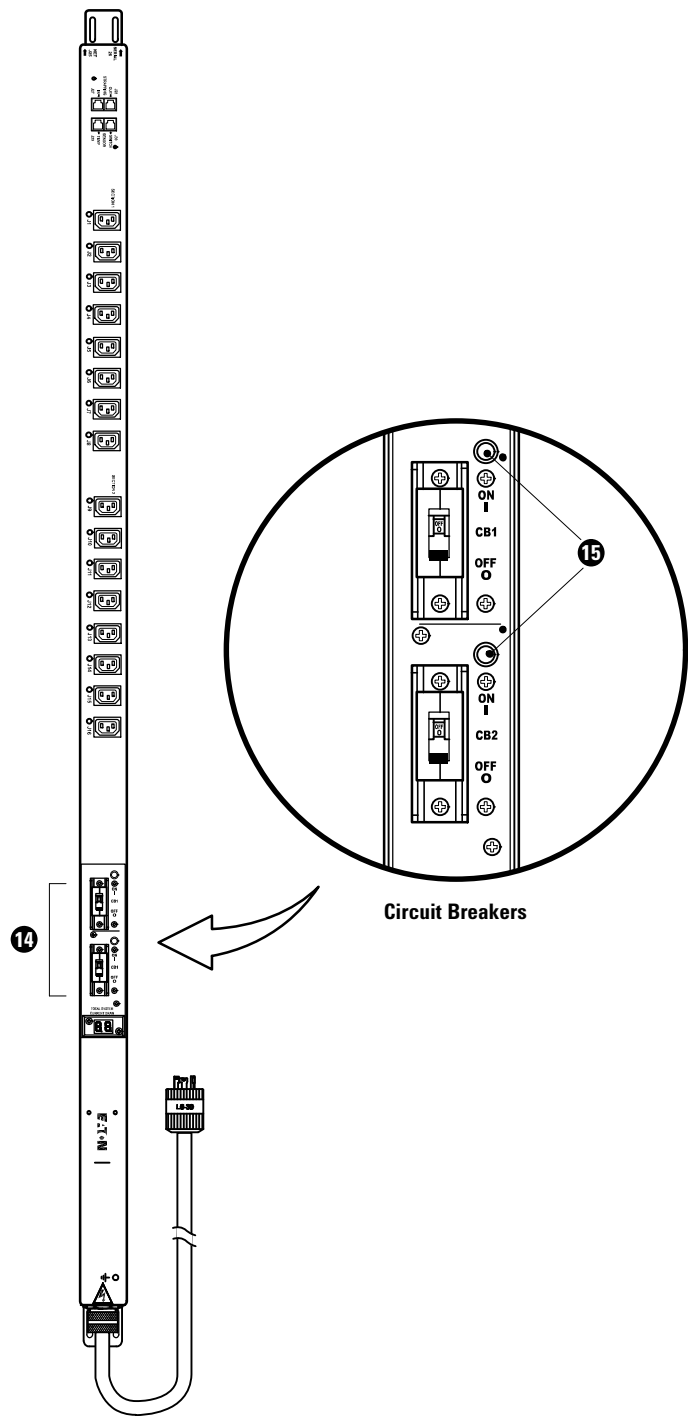


Figure 11. Circuit Breakers (Model PW105SWOU154 Shown)

Table 4. Circuit Breakers

Item	Feature	Description
14.	Magnetic Resettable Circuit Breakers	Switched ePDUs with 16 outlets have circuit breakers.
15.	Circuit Breaker LED	Illuminates blue when the circuit breaker is on.

This page intentionally left blank.

Chapter 7

Switched ePDU Initial Configuration

This chapter explains how to set up the Switched ePDU and configure it for network connectivity.

Hardware Setup

To set up the hardware:

1. **RS-232 serial interface.** Connect the serial cable (supplied) from the serial port on the top of the Switched ePDU to a computer DB-9 serial port (COM port). See Figure 2 on page 4 for port locations.



NOTE RS-232 is a type of standard protocol for serial communications. The standard includes specifications such as voltage and pin configurations for communications functions. Transmission distance is limited to 50 feet (15.24 meters). RS-232 uses 9- or 25-pin connector configurations.

2. **Web, Telnet, or SNMP interfaces.** Connect the Ethernet cable (supplied) from the RJ-45 receptacle labeled “NET” on the top of the Switched ePDU to a port on a network switch. See Figure 2 on page 4 for port locations.
3. Connect the Switched ePDU power cable to an appropriate electrical outlet (AC power receptacle).

If the Switched ePDU has an IEC power inlet, connect a matching power cable from the inlet to an electrical outlet (power cable for Switched ePDUs with inlets must be ordered separately).

Configuration Using a Serial (RS-232) Connection

To set up a serial connection and configure the Switched ePDU:



NOTE A terminal emulation program (such as Procomm Plus™ or HyperTerminal®) can communicate with another computer or network as if it were a specific type of terminal directly connected to that computer or network.

1. Start a terminal emulation program with the following settings:

Setting	Value
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
Terminal Type	ANSI (VT100)
Local Echo	Off

About 15 seconds after power is applied to the Switched ePDU, the Switched ePDU's network and hardware parameters display for approximately 5 seconds. The Switched ePDU then completes its initialization and displays a login prompt, similar to the following sample of boot text:

```

Bootloader Version 1.0.B
■ Decompressing Image into RAM, please wait...

Eaton Corporation
Data Center Solutions ■ Eaton
Support and Sales:
Call: (800)356-5737
Email: technicalsales@eaton.com
NET+WORKS Version 6.0
PLATFORM: ePDU3600
APPLICATION: Eaton Switched ePDU Firmware 2.0.H
=====

NETWORK INTERFACE PARAMETERS:
  IP address on LAN is 192.168.168.168
  LAN interface's subnet mask is 255.255.255.0
  IP address of default gateway to other networks is 192.168.168.1
HARDWARE PARAMETERS: Serial channels will use a baud rate of 9600
  This board's MAC Address is 00:04:F3:00:06:35
  After board is reset, start-up code will wait 5 seconds
  Default duplex setting for Ethernet connection: Half Duplex
  The unit is configured for 16 outlets.
  Resetting system defaults: No
  Strapping ID: 0
=====

FS=FORTH NVRAM Format. START_OF_FREE_NVRAM=0x140
Press any key in 5 seconds to change these settings.
  Loading Data from NVRAM.
  Com1 Online at 8,N,1,None 9600 Baud.
  Current time and date:
    Date: 05/23/2008
    Time: 10:00
  Standard Web Server Started on Port 80.
  Telnet Services started on Port 23.
  SNMP Services started on Port 161.
  Email Services Started ■ Mail Server:0.0.0.0.

Eaton Switched ePDU Login

Enter UserName:

```

2. Enter **Admin** for the default username and **ipc** for the default password at the login prompt. Both the username and password are case-sensitive, as is the text-based menu navigation. The main menu displays after logging in, similar to the following example:

```

Enter UserName: Admin
Enter Password: ***

Eaton Switched ePDU
Software Version 2.0.H
=====

Date:      05/29/2008
Time:      06:59
Up Time:   0 day(s) 17 hour(s) 41 minute(s)
User:      Admin
Unit Name: Switched ePDU, Strapping ID: 0

-- Main Menu --
1- Outlet Control
2- Outlet-Environmental Configuration
3- Unit Configuration
4- Outlet-Environmental Status
5- Logout
6- Soft Reboot
7- Choose Strapping Device
Select Item Number: 3

```

Menu options are selected by entering the corresponding option number.

3. If you plan to use the network-based interfaces (Web, Telnet, or SNMP), continue to Step 4 to configure the network settings. Otherwise, continue to Step 6.

4. Select option 3 (Unit Configuration), then option 2 (Network Configuration). The following menu displays:

```

-- Network Settings Sub Menu --
1- *Use DHCP:           Disabled
2- *Unit IP Address:    166.99.182.215
3- *Subnet Mask:        255.255.255.0
4- *Default Gateway:    166.99.182.250
-- MAC Address:         00:04:F3:00:06:35
5- *Telnet Access:      Enabled
6- *Telnet Port:        23
7- *Web Access:         Enabled
8- *Secure Server:      Disabled
9- *Web Port:           80
A- Ping Enabled:        Disabled
B- Ping Interval:       60 (minutes)
C- *Serial Baud Rate:   9600
D- SNMP Menus

```

* - require soft reboot to take effect.

```

-- Other Choices --
<ESC> = Back
<s>   = Outlet/Environmental status

```

Select Item Number:

5. TCP/IP settings are automatically configured when Use DHCP is enabled. TCP/IP settings can be manually configured when Use DHCP is disabled by changing the IP address, subnet mask, and default gateway settings.
6. Select option 6 from the Main Menu to implement a soft reboot. Changes to the network settings do not take effect until the Switched ePDU is rebooted.

Configuration Through the Network Connection



NOTE The Switched ePDU comes with a default IP address of 192.168.168.168. If you are unable to connect to the Switched ePDU through the network connection with this default address, change the IP address using the serial interface before using any of the network interfaces.

Accessing the Web Interface

The Web interface can be accessed using any standard Web browser that supports JavaScript and 64-bit encryption. Up to 11 users can be logged in to the Web interface at a time regardless of serial or Telnet connections. Web access is enabled by default, but the Admin user can disable it on the Network Settings menu using a serial or Telnet interface, or from the Web interface Network Configuration page.

To access the Web interface:

1. Open your Web browser and navigate to the Switched ePDU's IP address (for example: <http://192.168.168.168/>).
2. Enter **Admin** for the default username and **ipc** for the default password at the login prompt (both are case-sensitive). See Figure 12.

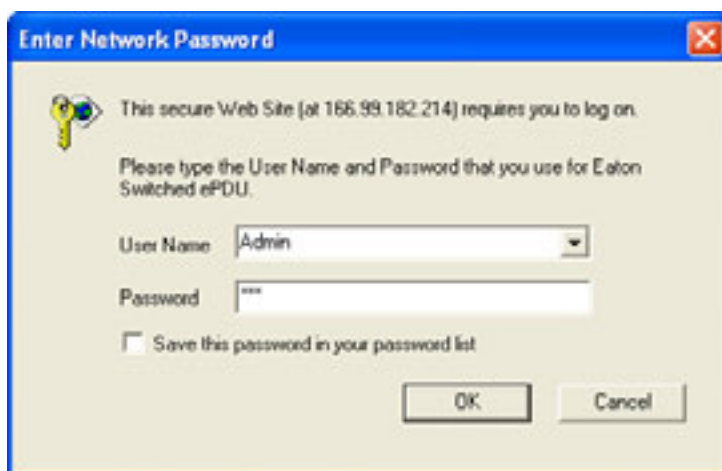


Figure 12. Login Prompt (Typical)

The Home page displays with a navigation bar on the left and the Unit Status on the right. Click any of the links in the navigation bar to open the corresponding page in the right portion of the window. See Figure 13.

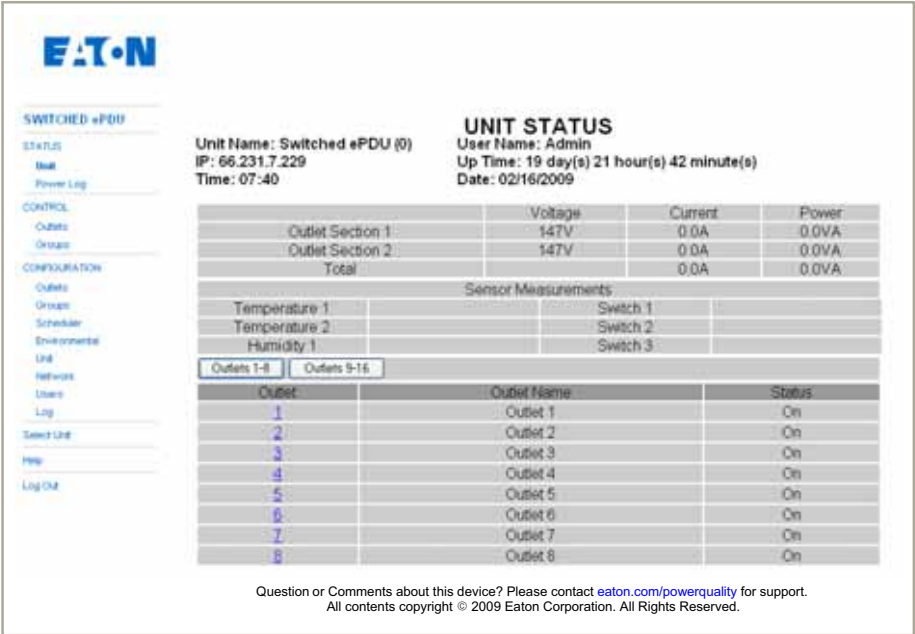


Figure 13. Unit Status Page (Typical)

Telnet Interface

Telnet is a communication protocol that uses port 23 (typically) to communicate to a network device. Most terminal emulation programs can make a Telnet connection.

The Telnet interface is text-driven and uses a menu structure almost identical to that accessed through a serial connection. Any standard Telnet client works with this interface. Telnet access is enabled by default, but the Admin user can disable it on the Network Settings menu using a serial or Telnet interface, or from the Web interface Network Configuration page.



NOTE Using the serial and Telnet interfaces at the same time can cause unpredictable results. Do not use these interfaces simultaneously.

1. Using a Telnet client, connect using the Switched ePDU's IP address (for example: 192.168.168.168), port 23. A login prompt displays.
2. Enter **Admin** for the default username and **ipc** for the default password at the login prompt (both are case-sensitive). The main menu displays after logging in:

```
Eaton Switched ePDU LoginVersion 2.0.H

login: Admin
Password: ***

Eaton Switched ePDU
Software Version 2.0.H
=====
Date:      mm/dd/yyyy
Time:      mm:hh
Up Time:   0 day(s) 0 hour(s) 0 minute(s)
User:      Admin
Unit Name: Switched ePDU,  Strapping ID:  0

-- Main Menu --
1- Outlet Control
2- Outlet-Environmental Configuration
3- Unit Configuration
4- Outlet-Environmental Status
5- Logout
6- Soft Reboot
7- Choose Strapping Device
Select Item Number:
```

SNMP Interface

The SNMP interface conforms to version 2c of the SNMP protocol. Settings can be read from and written to the Switched ePDU using this interface, and configurable traps can be directed to a network IP address. A MIB file can be downloaded from www.eaton.com/powerquality. SNMP access is disabled by default; the Admin user can enable it from the Network Configuration screen.

This page intentionally left blank.

Chapter 8

Switched ePDU Admin Using Serial or Telnet

This chapter explains how to use serial and Telnet interfaces to administer the Switched ePDU. Before using these interfaces, follow the instructions in Chapter 7, “Initial Configuration” to open either a serial or Telnet connection to the Switched ePDU.

About the Serial and Telnet Interfaces

The serial and Telnet interfaces use the same text navigation menu to view outlet status and logs, issue outlet commands, and change settings. This chapter describes this navigation menu according to the menu structure.

The serial and Telnet interfaces use the same menu structure (see Table 5). The only differences between them are:

- The serial interface does not require [Enter] to be pressed after selecting a menu option, while the Telnet interface does.
- The serial interface uses the [Esc] key to go back in the menu while the Telnet interfaces uses the [b] key.



NOTE Both the serial and Telnet interfaces are case-sensitive. It is important to use the correct case when selecting menu options and when creating descriptive names for outlets and groups.

Table 5. Serial and Telnet Interface Menu Structure

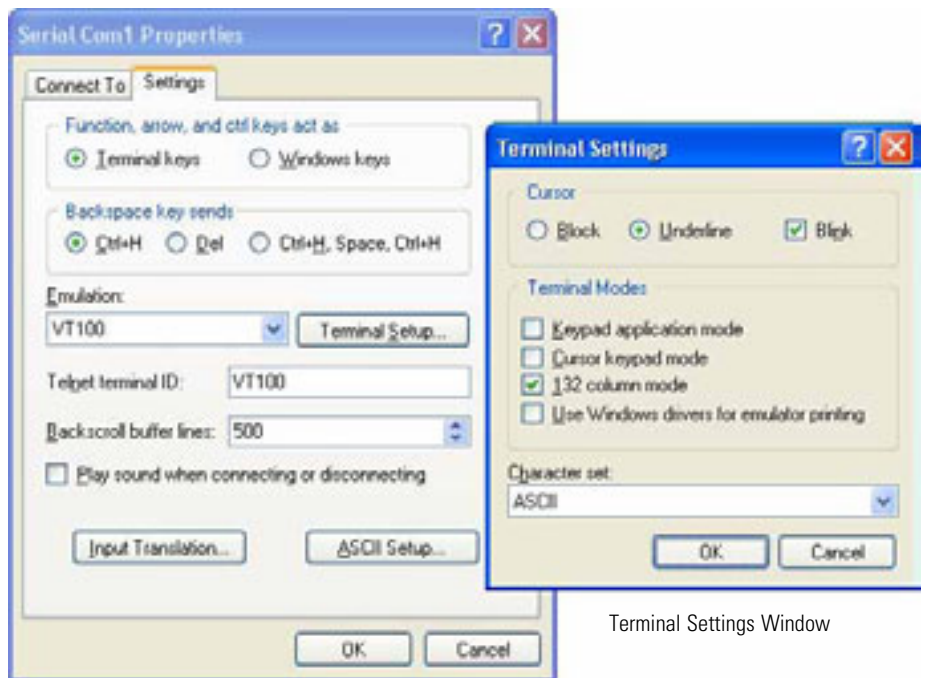
Main Menu	Submenu (Level 2)	Submenu (Level 3)
Outlet Control	Outlet Control	
	Group Control	
	Global Control	
Outlet-Environmental Configuration	Outlet Configuration	
	Outlet Groups	
	Auto Scheduler	
	Outlet Startup Mode	
	Environmental Settings	Temperature Sensor(s) Setup Humidity Sensor Setup Contact Closure Switch(es) Setup Voltage/Current Threshold Setup Display Sensor Measurements Display VA Measurements (Power Log)
Unit Configuration	Unit Configuration	
	Network Settings	SNMP Menus
	User Manager	
	Log Manager	View Log/Alert Sub Menu
	Administrative Utilities	Update Firmware Show Firmware version Set System Defaults
Outlet-Environmental Status	Outlet Section 1 (1–8)	
	Outlet Section 2 (9–16)	
	Outlet Section 3 (17–24)	
	Environmental Sensors	
Logout		
Soft Reboot		
Choose Strapping Device		

Setting Terminal Width

Some screens in the interface may be 132 characters wide instead of the standard 80 characters. To prevent characters from wrapping, set the terminal width to 132 characters using HyperTerminal (or other terminal emulation program).

To set the terminal width:

1. Click **Start > All Programs > Accessories > Communications > HyperTerminal**. The HyperTerminal window opens.
2. Select **Properties** from the **File** menu. The Properties window opens (see Figure 14).
3. Select the **Settings** tab.
4. Select **VT100** from the Emulation list, then click **Terminal Setup**. The Terminal Settings window opens (see Figure 14).
5. Select **132 column mode** and click **OK**, then click **OK** again to return to the HyperTerminal window.



Properties Window

Terminal Settings Window

Figure 14. HyperTerminal Properties and Terminal Settings Windows (Typical)

Main Menu

After logging in, the Main Menu displays:

```
Enter UserName: Admin
Enter Password: ***

Eaton Switched ePDU
Software Version 2.0.J
=====
Date:      mm/dd/yyyy
Time:      hh:mm
Up Time:   0 day(s) 0 hour(s) 0 minute(s)
User:      Admin
Unit Name: Switched ePDU,  Strapping ID:  0

-- Main Menu --
1- Outlet Control
2- Outlet-Environmental Configuration
3- Unit Configuration
4- Outlet-Environmental Status
5- Logout
6- Soft Reboot
7- Choose Strapping Device

Select Item Number:
```

Outlet Control Menu

```
-- Control Sub Menu --

1- Outlet Control
2- Group Control
3- Global Control

-- Other Choices --
<b> = Back
<s> = Outlet/Environmental status

Select Item Number:
```

Choosing **Outlet Control** or **Group Control** displays a list of outlets or groups of outlets that can be controlled. Outlets and groups are set up under Outlet-Environmental Configuration. For example, an outlet control screen may look like the following:

== Outlet Control Sub Menu ==

Outlet Section 1 Measurements

Voltage: 146 V

Current: 0.0 A

Power: 0.0 VA

	Outlet Name	Current State
1	Outlet 1	On
2	Outlet 2	On
3	Outlet 3	On
4	Outlet 4	On
5	Outlet 5	On
6	Outlet 6	On
7	Outlet 7	On
8	Outlet 8	On

== Other Choices ==

 = Back

<s> = Outlet/Environmental status

<n> = Next outlet section

Select Item Number: 2

== Outlet 2 Command Choices ==

1= Immediate On

2= Immediate Off

3= Reboot

== Other Choices ==

 = Back

<s> = Outlet/Environmental status

Select Outlet Command: 3

== Outlet 2 Command Verification ==

Outlet 2 Requested Command is Reboot.

Press the <Enter> key to implement or the <Esc> to cancel the command.

The measured voltage, measured current, and calculated apparent power are displayed at the top of the page. For all single-phase Switched ePDUs (8-outlet, 16-outlet, and some 24-outlet Switched ePDUs), these values correspond to what is measured for the displayed outlet section. For three-phase Switched ePDUs (most 24-outlet Switched ePDUs), these values are generally measurements of phase voltage and phase current and the calculated phase power; values displayed for section 1 correspond to phase X, those for section 2 correspond to phase Y, and those for section 3 correspond to phase Z. Be sure to read the label next to the measurements for an exact description.

Selecting the number corresponding to an outlet or group gives options to change the state to **Immediate On**, **Immediate Off**, or **Reboot**. Rebooting an outlet turns the outlet off, waits for the amount of time specified in the outlet configuration, then turns the outlet back on. Rebooting a group turns all of the outlets off, waits for the amount of time specified in the outlet configuration, then turns each outlet on when its individual reboot time has passed.

Global Control gives the following options:

```
== Global Commands Sub Menu ==

1- Global Sequence On
2- Global Sequence Off
3- Global Immediate On
4- Global Immediate Off
```

Using these options, all outlets can be sequenced on, sequenced off, turned on at once, or turned off at once.

Outlet-Environmental Configuration Main Menu

```
== Outlet-Environmental Configuration Main Menu ==

1- Outlet Configuration
2- Outlet Groups
3- Auto Scheduler
4- Outlet Startup Mode
5- Environmental Settings

== Other Choices ==
<b> = Back
<s> = Outlet/Environmental status

Select Item Number:
```

Outlet Configuration

```
== Outlet Configuration Sub Menu ==

      Name           Ping IP       Link           Sequence  Reboot
-----
1  Outlet 1         0.0.0.0      http://         001 Sec    010 Sec
2  Outlet 2         0.0.0.0      http://         002 Sec    010 Sec
3  Outlet 3         0.0.0.0      http://         003 Sec    010 Sec
4  Outlet 4         0.0.0.0      http://         004 Sec    010 Sec
5  Outlet 5         0.0.0.0      http://         005 Sec    010 Sec
6  Outlet 6         0.0.0.0      http://         006 Sec    010 Sec
7  Outlet 7         0.0.0.0      http://         007 Sec    010 Sec
8  Outlet 8         0.0.0.0      http://         008 Sec    010 Sec

== Other Choices ==
<b> = Back
<s> = Outlet/Environmental status
<n> = Next outlet section

Select outlet number:
```

The Switched ePDU offers several outlet-specific settings. Enter the outlet number and step through the prompts to configure each outlet.

Table 6. Outlet Configuration

Setting	Description
Outlet Name	A maximum of 20 characters. The outlet name displays in the interface and logs.
Ping IP	Configures the outlet IP address for a “watch mode.” If Ping is enabled and a valid Ping Interval is set in the Network Settings menu (under the Unit Configuration main menu item), the Switched ePDU pings the IP address set up for this outlet according to the time specified by the Ping Interval. If there is no ping response, the outlet reboots. If the ping fails and the outlet is reboots three times in a row, the ping feature for that outlet stops until the Switched ePDU reboots or the Ping Enabled setting is briefly set to Disabled and then back to Enabled.
Link	Any hyperlink up to 30 characters. This feature is designed for ease of accessing all the devices attached to one Switched ePDU . After entering a link, click the outlet number in the Web interface Home page to open a new browser window and navigate to this address.
Sequence	Integers from 0 to 999 (in seconds). Outlets can be sequenced on or off using Global Sequence On and Global Sequence Off commands. Outlets can also be sequenced on when the ePDU powers up by changing the Outlet Startup Mode (under Outlet-Environmental Configuration). Sequencing outlets is primarily used to reduce inrush currents, but it can also be customized using this Sequence setting to allow certain pieces of equipment to boot up entirely before others receive power. The value for the Sequence On command is the amount of time from when the command is issued until a particular outlet turns on. A Sequence Off command works backwards, turning off the outlet with the largest Sequence value first. If the Sequence value is 0, the status of that outlet cannot be changed by sequence commands.
Reboot	Integers from 0 to 999 (in seconds). Specifies the number of seconds that an outlet remains in the off state following a reboot command.

Outlet Groups

== Outlet Groups Sub Menu ==

	Name	Outlets
1	Servers	1,2,3,4
2	Switches	9,10,11
3		
4		
5		
6		
7		
8		

== Other Choices ==

 = Back
<s> = Outlet/Environmental status

Select Group Number:

Outlet Groups are used to control several outlets with one command. To create a new group, enter the line number of any blank line. The ePDU then prompts for a group name and the numbers of the outlets to be included in the group, as in the following example:

Select Group Number: 3
Enter New Outlet Group Name: Fans

Outlet Group Format is 1,2,3 where each location is an outlet.
Example: 1,4,6,7 means outlets 1, 4, 6 & 7 are the only outlets to be part of this group.

17,18,19,20

== Outlet Groups Sub Menu ==

	Name	Outlets
1	Servers	1,2,3,7,8
2	Switches	5,9,10,11
3	Fans	17,18,19,20
4		
5		
6		
7		
8		

== Other Choices ==

<ESC> = Back
<s> = Outlet/Environmental status

Select Group Number:

Outlet Groups can be modified or deleted by entering the line number of an existing group and following the prompts.

Auto Scheduler

```

      ── Auto Scheduler Sub Menu ──
      Outlet/Group  Command      Every  Day    Time
      ───────────
1  Outlet 7        Immediate Off Day    No Day  20:00
2  Outlet 7        Immediate On  Day    No Day  06:00
3
4
5
6
7
8
9
A

```

```

      ── Other Choices ──
      <b> = Back
      <s> = Outlet/Environmental status

```

Select Item Number:

The Auto Scheduler can be used to configure outlets or groups of outlets to turn off, turn on, or reboot either daily or weekly. To create a new schedule item, enter the line number of any blank line. The Switched ePDU then prompts for the outlet or group, the action to take, and the frequency of the event, as in the following example:

Select Item Number: 4

Press <Esc> anytime to cancel all.

```

1 ─ HP Server          9 ─ Outlet 9    17 ─ Outlet 17   25 ─ Servers
2 ─ PowerEdge Server  10 ─ Outlet 10   18 ─ Outlet 18   26 ─ Switches
3 ─ Exchange Server   11 ─ Outlet 11   19 ─ Outlet 19   27 ─ Fans
4 ─ Disk Array 1       12 ─ Outlet 12   20 ─ Outlet 20
5 ─ Switch 1          13 ─ Outlet 13   21 ─ Outlet 21
6 ─ Disk Array 2       14 ─ Outlet 14   22 ─ Outlet 22
7 ─ Citrix Server      15 ─ Outlet 15   23 ─ Outlet 23
8 ─ Backup Server      16 ─ Outlet 16   24 ─ Outlet 24

```

Enter number next to the Outlet Name or Group Name or press <Enter> to skip: 26

Press <Esc> anytime to cancel all.

```

1─ Immediate On
2─ Immediate Off
3─ Reboot

```

Enter 1 ─ 3 for command choice or press <Enter> to skip:3Press <Esc> anytime to cancel all.

Every Options:

```

1─ Day
2─ Week

```

Select 1 or 2 or press <Enter> to skip:2

Press <Esc> anytime to cancel all.

```
Day Options:
1 Sunday
2 Monday
3 Tuesday
4 Wednesday
5 Thursday
6 Friday
7 Saturday

Select 1 - 7 or press <Enter> to skip:
1
Press <Esc> anytime to cancel all.

Time format: HH:MM on a 24-hour clock.

Examples: 04:08 22:15 (leading zeroes are required)
Enter the time or press <Enter> to skip:
23:30

      Auto Scheduler Sub Menu

Outlet/Group  Command      Every  Day      Time
-----
1 Outlet 9      Immediate Off Day      No Day  20:00
2 Outlet 9      Immediate On  Day      No Day  06:00
3 Switches      Reboot       Week     Sunday  23:30
4
5
6
7
8
9
A

Other Choices
<ESC> = Back
<s> = Outlet/Environmental status

Select item number to modify or delete:

Auto Scheduler events can be modified or deleted by entering the line number of an
existing event and following the prompts.
```

Outlet Startup Mode

== Outlet Startup Mode ==

The current Outlet Startup mode is Default==Last State.

- 1. Default==Last State
- 2. Sequence==Sequence Routine

== Other Choices ==

<ESC> = Back

<s> = Outlet/Environmental status

Select Item Number:

Outlet Startup Mode refers to the outlet startup sequence when power is connected to a Switched ePDU. By default, the outlets that were on when the Switched ePDU lost power are turned on simultaneously shortly after power is restored. If Sequence Routine is selected, the Switched ePDU initiates a Global Sequence On command after it boots up (there may be a 45-second delay before outlets begin to turn on). The Sequence setting in the Outlet Configuration can be used to customize the outlet sequence pattern, as well as to exclude certain outlets from being turned on.

Environmental Settings

== Environmental Configuration Sub Menu ==

- 1. Temperature Sensor(s) Setup
- 2. Humidity Sensor Setup
- 3. Contact Closure Switch(es) Setup
- 4. Voltage/Current Threshold Setup
- 5. Display Sensor Measurements
- 6. Display VA Measurements

== Other Choices ==

<ESC> = Back

<s> = Outlet/Environmental status

Select Item Number:

Temperature Sensor Setup

Temperature Sensor Main Menu							
Sensor Name	Enabled	High Threshold	Low Threshold	Ctrl Outlet/Group	Outlet/Group Name	State	
1 Temperature 1	Yes	125	32	No		Off	
2 Temperature 2	Yes	125	32	Yes	Fans	On	

Temperature probes are available as an accessory from your Eaton sales representative.

Switched ePDUs have four RJ-45 ports on the face, one of which is labeled "Temp J29". This port supports three types of external probes:

- T1 probe (contains a temperature sensor wired to the Temperature 1 input)
- T1H1 probe (the same as T1 probe, plus a humidity sensor)
- T2 probe (contains a temperature sensor wired to the Temperature 2 input).

The T1 or T1H1 probe can be used simultaneously with a T2 probe by connecting them to the Temp port through an RJ-45 "Y" adapter (also available from Eaton). Contact your Eaton sales representative for more information.

After connecting a probe containing a temperature sensor, the sensor must be enabled in the software. If a temperature sensor is enabled in the software, but an actual sensor is not connected, a temperature reading of 249.9°F or 121.1°C displays. Temperature sensors also have configurable thresholds and can be set up to control outlets or groups based on the thresholds. To configure these settings, enter the appropriate sensor number from the menu and follow the prompts.

Table 7. Temperature Sensor Configuration

Setting	Description
Sensor Name	A maximum of 20 characters. The sensor name displays in the interface and logs.
Enabled	A sensor must be enabled before the readings display.
High Threshold	When the readings cross above this threshold, e-mail alerts and/or SNMP traps may be sent, depending on the Log Manager and SNMP Settings configuration. Set Fahrenheit or Celsius in Unit Configuration.
Low Threshold	When the readings cross below this threshold, e-mail alerts and/or SNMP traps may be sent, depending on the Log Manager and SNMP Settings configuration. Set Fahrenheit or Celsius in Unit Configuration.
Control Outlet/Group	If the sensor is to report only the temperature readings, set to No. If set to Yes, this prompt continues with an opportunity to select an outlet or group to control. NOTE If an outlet or group name is later changed, control from the sensors or switches do not work until they are reconfigured with the new name.
State	On or Off. If the setting is On, the outlet or group turns on when the temperature is above the upper threshold or below the lower threshold; the outlet or group turns off when the temperature is between the upper and lower thresholds. If the setting is Off, the outlet or group turns off when the temperature is above the upper threshold or below the lower threshold; the outlet or group turns on when the temperature is between the upper and lower thresholds.

Humidity Sensor Setup

--- Humidity Sensor Main Menu ---

Sensor Name	Enabled	High Threshold	Low Threshold	Ctrl Outlet/Group	Outlet/Group Name	State
1 Humidity 1	Yes	70	0	No		Off

 = Back

Select Sensor Number:

Humidity probes are available as an accessory from Eaton. See the probe description in “Temperature Sensor Setup” on page 46 for more information.

After connecting a probe containing a humidity sensor, the sensor must be enabled in the software. If a humidity sensor is enabled in the software, but an actual sensor is not connected, a humidity reading of 100% displays. Humidity sensors also have configurable thresholds and can be set up to control outlets or groups based on the thresholds. To configure these settings, enter the appropriate sensor number and follow the prompts.

Table 8. Humidity Sensor Configuration

Setting	Description
Sensor Name	A maximum of 20 characters. The outlet name displays in the interface and logs.
Enabled	A sensor must be enabled before the readings display.
High Threshold	When the readings cross above this threshold, e-mail alerts and/or SNMP traps may be sent, depending on the Log Manager and SNMP Settings configuration.
Low Threshold	When the readings cross below this threshold, e-mail alerts and/or SNMP traps may be sent, depending on the Log Manager and SNMP Settings configuration.
Control Outlet/Group	If the sensor is to report only the humidity readings, set to No. If set to Yes, this prompt continues with an opportunity to select an outlet or group to control. NOTE If an outlet or group name is later changed, control from the sensors or switches does not work until they are reconfigured with the new name.
State	On or Off. If the setting is On, the outlet or group turns on when the humidity is above the upper threshold or below the lower threshold; the outlet or group turns off when the humidity is between the upper and lower thresholds. If the setting is Off, the outlet or group turns off when the humidity is above the upper threshold or below the lower threshold; the outlet or group turns on when the humidity is between the upper and lower thresholds.

Contact Closure Switch Setup

--- Contact Sensor Main Menu ---

Sensor Name	Enabled	Ctrl Outlet/Group	Outlet/Group Name	State
1 Switch 1	Yes	No		Off
2 Switch 2	Yes	No		Off
3 Switch 3	Yes	No		Off

 = Back

Select Sensor Number:

Switched ePDUs have four RJ-45 ports on the face, one of which is labeled “Switch.” This port supports three external contact closures. See “Contact Sensor Wiring” on page 94 for detailed information.

After connecting a contact closure, the appropriate sensor must be enabled in the software. If a contact closure is enabled but an actual switch or sensor is not connected, the contact state displays as Open. Contact sensors can also be set up to control outlets or groups based on their state. To configure these settings, enter the appropriate sensor number and follow the prompts.

Table 9. Contact Sensor Configuration

Setting	Description
Sensor Name	A maximum of 20 characters. The outlet name displays in the interface and logs.
Enabled	A sensor must be enabled before the contact state displays.
Control Outlet/Group	If the sensor is to report the contact state, set this setting to No. If set to Yes, this prompt continues with an opportunity to select an outlet or group to control. NOTE If an outlet or group name is later changed, control from the sensors or switches does not work until they are reconfigured with the new name.
State	Either On or Off. If the setting is On, the outlet or group turns on when the contact state is Closed; the outlet or group turns off when the contact state is Open. If the setting is Off, the outlet or group turns off when the contact state is Open; the outlet or group turns on when the contact state is Closed.

Voltage/Current Threshold Setup

--- Line Metering Main Menu ---

1 Power Log Interval

		Voltage Threshold		Current Threshold		Ctrl	Outlet/Group
		High	Low	High	Low	Outlet/Group	Name
2	Phase X	140	95	20	0	No	
3	Phase Y	140	95	20	0	No	
4	Phase Z	140	95	20	0	No	

 = Back

Select Item Number:

Table 10. Power Log Configuration

Setting	Description
Power Log / VA Monitor Interval	Options are 5 minutes, 15 minutes, 60 minutes, or disabled. The Power Log tool multiplies the measured voltage and the current to calculate the apparent power and records the result at the interval specified by this setting. When set to disabled, the Power Log does not record the apparent power values.
Outlet Section Thresholds	Each voltage and current measurement can be configured to have both a lower and upper voltage and a current threshold. For all single-phase Switched ePDUs (8-outlet, 16-outlet, and some 24-outlet Switched ePDUs), these thresholds correspond to what is measured for each 8-outlet section. For most three-phase Switched ePDUs, these thresholds are for phase voltage and phase current – thresholds for section 1 correspond to phase X, those for section 2 correspond to phase Y, and those for section 3 correspond to phase Z. To configure these thresholds, enter the appropriate line number from the menu and follow the prompts.
Voltage Thresholds	When the voltage measurement crosses above the upper threshold or below the lower threshold, e-mail alerts and/or SNMP traps may be sent, depending on the Log Manager and SNMP Settings configuration.
Current Thresholds	When the current measurement crosses above the upper threshold or below the lower threshold, e-mail alerts and/or SNMP traps may be sent, depending on the Log Manager and SNMP Settings configuration.
Control Outlet/Group	If the thresholds are not used, or if they are only used for notification of a power problem, set to No. If set to Yes, this prompt continues with an opportunity to select an outlet or group to control. The outlet or group that is selected turns off when the voltage or current goes above the upper threshold or below the lower threshold. The outlet or group does not turn back on when the voltage or current returns to a value between the two thresholds. NOTE If an outlet or group name is later changed, control from the voltage or current thresholds does not work until they are reconfigured with the new name.

Display Sensor Measurements

== Sensor Display Main Menu ==

Temperature 1: 73.70F
Temperature 2: 119.40F
Humidity 1: 22.8%
Switch 1: Open
Switch 2: Closed
Switch 3: Open

Any key to update display
 = Back

This menu option displays the current temperature, humidity, and contact sensor readings. Sensor measurements are updated every few seconds; press any key to refresh the screen with the latest measurements.

Display Power Log / VA Measurements

== Power Log ==

	Date	Time	Outlet Section 1	Outlet Section 2
1	05/29/2008	10:27	0.0	0.0
2	05/29/2008	10:32	0.0	0.0
3	05/29/2008	10:37	0.0	0.0
4	05/29/2008	10:42	0.0	0.0
5	05/29/2008	10:47	0.0	0.0

Press <ENTER> to cycle through measurements
 = Back

Power Log data is collected by multiplying the measured voltage and current to calculate the apparent power and recording the result at the Power Log Interval specified in the Voltage/Current Threshold Setup (see Table 10). Up to 50 hours (60-minute time interval), 12 hours 30 minutes (15-minute time interval), or 4 hours 10 minutes (5-minute time interval) of history is available at any time.



NOTE Power Log data is maintained only while the Switched ePDU is in normal operation; all data is lost if the Switched ePDU is rebooted or power is disconnected.

Unit Configuration Main Menu

== Unit Configuration Main Menu ==

- 1- Unit Configuration
- 2- Network Settings
- 3- User Manager
- 4- Log Manager
- 5- Administrative Utilities

== Other Choices ==

 = Back
<s> = Outlet/Environmental status

Select Item Number:

Unit Configuration Submenu

```

-- Unit Configuration Sub Menu --
1- Unit Name:                Switched ePDU
2- Admin User Name:          Admin
3- Admin Password:           *****
4- Time:                     07:26
5- Date:                     05/29/2008
6- Timeout in Seconds:       300
7- Fahrenheit/Celsius:       Fahrenheit
8- Display:                  Normal

-- Other Choices --
<b> = Back
<s> = Outlet/Environmental status
Select Item Number:

```

Table 11. Unit Configuration

Setting	Description
Unit Name	A maximum of 20 characters. The unit name displays in the interface and logs.
Admin User Name	Cannot be changed from the default Admin (case-sensitive).
Admin Password	The default Admin password is ipc (case-sensitive). The password can be modified using any combination of a–z, A–Z, and 0–9 characters and must be from 1 to 20 characters in length.
Time	Time is stored in 24-hour format. For example, enter 5:20 p.m. as 17:20.
Date	Dates are stored in mm/dd/yyyy format.
Timeout in Seconds	Any integer between 30 and 999. Timeout refers to the length of inactivity before a user is automatically logged off. The default is 300 seconds.
Fahrenheit/Celsius	Fahrenheit or Celsius. These units are used for displaying temperature readings from an optional external temperature probe.
Display	Normal or Inverted. The meter display on the face of the Switched ePDU displays the current for each outlet section or phase. These readings can be inverted for easier reading depending on the Switched ePDU's mounting orientation.

Network Settings

== Network Settings Sub Menu ==
1- *Use DHCP: Disabled
2- *Unit IP Address: 166.99.182.215
3- *Subnet Mask: 255.255.255.0
4- *Default Gateway: 166.99.182.250
- MAC Address: 00:04:F3:00:7C:ED
5- *Telnet Access: Enabled
6- *Telnet Port: 23
7- *Web Access: Enabled
8- *Secure Server: Disabled
9- *Web Port: 80
A- Ping Enabled: Disabled
B- Ping Interval: 60 (minutes)
C- *Serial Baud Rate: 9600
D- SNMP Menus

* - require soft reboot to take effect.

== Other Choices ==
 = Back
<s> = Outlet/Environmental status

Select Item Number:



NOTE Many of these network settings require a soft reboot to take effect (select **Soft Reboot** from the Main Menu).

Table 12. Network Configuration

Setting	Description
Use DHCP*	Enabled or Disabled. If DHCP is enabled, the IP address, subnet mask, and default gateway information is obtained from the network DHCP server, and these obtained values overwrite whatever settings are in options 2, 3, and 4. If DHCP is disabled, the values in settings 2, 3, and 4 are used to communicate with the network.
Unit IP Address*	Enter standard dot notation (for example, 192.168.168.168).
Subnet Mask*	Enter standard dot notation (for example, 255.255.255.0).
Default Gateway*	Enter standard dot notation (for example, 192.168.168.1).
MAC Address	This value is unique to this Switched ePDU and cannot be changed from this menu. If customization is necessary, see “Advanced Boot Configuration” on page 91 for instructions.
Telnet Access*	Enabled or Disabled.
Telnet Port*	Any integer from 1 to 65535 (default is 23).
Web Access*	Enabled or Disabled.
Secure Server	Enabled or Disabled. Each time the Switched ePDU reboots (or power is applied to the Switched ePDU when the Secure Web is enabled), the boot process takes up to five minutes to generate a new secure server certificate. During this time the Switched ePDU is unavailable from all interfaces, and outlet operations, such as power on sequencing, is delayed until the certificate has been generated (the boot process can be monitored over a serial connection). After the Switched ePDU reboots, the secure Web interface is available at port 443 (this port number is fixed) using the secure URL format (for example, https://192.168.168.168).
Web Port*	Any integer from 1 to 65535 (default is 80). The Web Port setting affects Web access only when the Secure Server setting is set to Disabled.
Ping Enabled	Enabled or Disabled; changes take effect immediately. If Ping is enabled, the Switched ePDU pings the IP address set up for each outlet (see “Outlet Configuration” on page 40) according to the time specified by the Ping Interval. If there is no ping response, the outlet reboots. If the ping fails and the outlet reboots three times in a row, the ping feature for that outlet stops until the Switched ePDU reboots or the Ping Enabled setting is briefly set to Disabled and then back to Enabled.
Ping Interval	Any integer from 5 to 60 minutes; changes take effect immediately.
Serial Baud Rate*	9600, 19200, or 38400 baud (default is 9600). All other serial settings are fixed at 8 data bits, no parity, 1 stop bit, and no flow control.
SNMP Menus	See the following section, “SNMP Menus.”

* Requires a soft reboot to take effect (select Soft Reboot from the Main Menu).

SNMP Menus**== SNMP Settings ==**

1	*Public Community Name	public
2	*Private Community Name	private
3	*Trap Community Name (public)	public
4	TRAP IP Address	0.0.0.0
5	*SNMP Enabled	Enabled

==Trap Settings==

6	Trap User Login	Disabled
7	Trap Failed Login	Disabled
8	Trap Outlet Activity	Disabled
9	Trap System On/Off	Disabled

A	Trap Voltage/Current Threshold	Disabled
B	Trap Temperature Threshold	Disabled
C	Trap Humidity Threshold	Disabled
D	Trap Contact Threshold	Disabled

* **■** require soft reboot to take effect.

== Other Choices ==

 = Back

<s> = Outlet/Environmental status

Select Item Number:

The SNMP interface conforms to version 2c of the SNMP protocol. Settings can be read from and written to the ePDU through this interface, and configurable traps can be directed to a network IP address.

Table 13. SNMP Configuration

Setting	Description
Public Community Name*	Up to 20 characters long (default is "public").
Private Community Name*	Up to 20 characters long (default is "private").
Trap Community Name (public)*	Up to 20 characters long (default is "public").
Public Community Password*	Up to 20 characters long (default is "public").
Private Community Password*	Up to 20 characters long (default is "private").
Trap IP Address	Enter in standard dot notation (for example, 192.168.168.100). All traps are sent to this address at port 161.
SNMP Enabled*	Enabled or Disabled. When running, the SNMP server is bound to port 162.
Trap User Login	Enabled or Disabled. When enabled, a trap is sent to the Trap IP Address each time a user logs in to or logs out of the serial, Telnet, or Web interfaces.
Trap Failed Login	Enabled or Disabled. When enabled, a trap is sent to the Trap IP Address when a user fails to log in three times in a row with an invalid username or password to the serial, Telnet, or Web interfaces.
Trap Outlet Activity	Enabled or Disabled. When enabled, a trap is sent to the Trap IP Address each time an outlet action occurs.
Trap System On/Off	Enabled or Disabled. When enabled, a trap is sent to the Trap IP Address each time the ePDU completes booting up.
Trap Voltage/Current Threshold	Enabled or Disabled. When enabled, a trap is sent to the Trap IP Address each time the measured voltage or current rises above the upper threshold or falls below the lower threshold (as set in the "Voltage/Current Threshold Setup" on page 49).
Trap Temperature Threshold	Enabled or Disabled. When enabled, a trap is sent to the Trap IP Address each time the measured temperature for an enabled temperature sensor rises above the upper threshold or falls below the lower threshold (as set in the "Temperature Sensor Setup" on page 46).
Trap Humidity Threshold	Enabled or Disabled. When enabled, a trap is sent to the Trap IP Address each time the measured humidity for an enabled humidity sensor rises above the upper threshold or falls below the lower threshold (as set in the "Humidity Sensor Setup" on page 47).
Trap Contact Threshold	Enabled or Disabled. When enabled, a trap is sent to the Trap IP Address each time an enabled contact sensor changes state from Closed to Open or from Open to Closed.

* Requires a soft reboot to take effect (select Soft Reboot from the Unit Configuration page, then click Save Changes).

User Manager

User Manager Sub Menu

	Username	Password	Status	Outlet Access
1	Fred	*****	Enabled	1,2,3,4
2	John	*****	Enabled	3,4,6
3				
4				
5				
6				
7				
8				
9				
A				
B				

Other Choices

 = Back

<s> = Outlet/Environmental status

Select Item Number:

Up to 11 non-Admin users can be set up with separate user accounts and access rights. These users can log in to the serial, Telnet, and Web interfaces, but they have limited access. The menus available allow the non-Admin user to view only outlet and environmental status and control outlets to which the user has been given access.

To create a new user, enter the line number of any blank line. The Switched ePDU prompts you for a username, password, whether the user login should be enabled, and the numbers of the outlets to which the user will have access, as in the following:

Select Item Number: 3

Enter New Outlet User Name: Bill

Enter password <Enter to Skip>: ****

Confirm password: ****

Press <Esc> anytime to cancel all.

Outlet User access is currently not defined

1 = Outlet User Enabled

2 = Outlet User Disabled

Select Item Number or press <Enter> to skip:

1

Outlet Format is 1,2,3 where each location is an outlet.

Example: 1,4,6,7 means outlets 1, 4, 6 & 7 are the only outlets to be part of this group.

1,5,7

```

-- User Manager Sub Menu --
      Username      Password      Status      Outlet Access
-----
1 Fred            *****      Enabled    1,2,3,4
2 John            *****      Enabled    3,4,6
3 Bill            *****      Enabled    1,5,7
4
5
6
7
8
9
A
B

```

```

-- Other Choices --
<b> = Back
<s> = Outlet/Environmental status

```

Select Item Number:

Users can be modified or deleted by entering the line number of the existing user and following the prompts.

Log Manager

```

-- Log Manager Sub Menu --
1 Mail Server:      0.0.0.0
2 Send Log To:      User@eaton.com
3 Send Log To User 2: User1@eaton.com
4 Send Alerts To:   User@eaton.com
5 Send Alerts To User 2: User1@eaton.com
6 Send Log From:    ePDU@eaton.com
7 Send Log:         Week
8 Every:            Monday
9 At:               07:00
A View Log/Alert Sub Menu

```

```

-- Other Choices --
<b> = Back
<s> = Outlet/Environmental status

```

Select Item Number:

The Log Manager contains all settings related to logs and alerts. Logs are kept of the items selected under the Log/Alert Submenu and sent by e-mail either on a periodic basis or every time the log is full. Alerts can also be enabled for selected items under the Log/Alert Submenu and are sent immediately after the event occurred. Both logs and alerts can be sent only through e-mail and are not available to be viewed from any of the user interfaces.

Table 14. Log Manager Configuration

Setting	Description
Mail Server	Enter in standard dot notation (for example: 192.168.168.1). All e-mail is sent through this server using the SMTP protocol.
Send Log To	Up to 30 characters. Specifies an e-mail address to which all logs are sent.
Send Log To User 2	Up to 30 characters. Specifies a second e-mail address to which all logs are sent.
Send Alerts To	Up to 30 characters. Specifies an e-mail address to which all alerts are sent.
Send Alerts To User 2	Up to 30 characters. Specifies a second e-mail address to which all alerts are sent.
Send Log From	Up to 30 characters. Specifies the e-mail address from which the logs and alerts are sent. This address appears as the "From" e-mail address in all sent e-mail messages.
Send Log	Day, Week, or When Full. Logs can be sent every day, once a week, or when the log buffer is full. If the setting is Day or Week, logs are sent at the specified interval; in addition, logs can be sent more frequently if the log buffer reaches capacity (the log buffer holds approximately 70 events).
Every	Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, or Saturday. This setting is visible only if Send Log is set to Week, and it is used to select the day of the week on which to send the log.
At	Enter time in the 24-hour format. This setting is visible only if Send Log is set to Day or Week, and it is used to select the time of day to send the log.
View Log/Alert Sub Menu	See the following section.

View Log/Alert Submenu

```

--- Log/Alert Sub Menu ---
    Events To Log
1  ■ User Login/Logout:      Disabled
2  ■ Failed Login Attempt:   Disabled
3  ■ Outlet Activity:        Disabled
4  ■ System On/Off:          Disabled
    Alerts To Send
5  ■ User Login/Logout:      Disabled
6  ■ Failed Login Attempt:   Disabled
7  ■ Outlet Activity:        Disabled
8  ■ System On/Off:          Disabled
9  ■ Voltage/Current Threshold: Disabled
A  ■ Temperature Threshold:  Disabled
B  ■ Humidity Threshold:     Disabled
C  ■ Contact Threshold:      Disabled

--- Other Choices ---
<b> = Back
<s> = Outlet/Environmental status

Select Item Number:

```

Table 15. Log/Alert Configuration

Section	Setting	Description
Events To Log	User Login/Logout	Enabled or Disabled. When enabled, an entry is added to the log each time a user logs in to or logs out of the serial, Telnet, or Web interfaces.
	Failed Login Attempt	Enabled or Disabled. When enabled, an entry is added to the log when a user tries unsuccessfully to log in to the serial, Telnet, or Web interfaces three times in a row due to an invalid username or an invalid password.
	Outlet Activity	Enabled or Disabled. When enabled, an entry is added to the log each time an outlet action occurs.
	System On/Off	Enabled or Disabled. When enabled, an entry is added to the log each time the Switched ePDU completes booting up.
Alerts To Send	User Login/Logout	Enabled or Disabled. When enabled, an e-mail alert is sent each time a user logs in to or logs out of the serial, Telnet, or Web interfaces.
	Failed Login Attempt	Enabled or Disabled. When enabled, an e-mail alert is sent when a user fails to log in three times in a row with an invalid username or password to the serial, Telnet, or Web interfaces.
	Outlet Activity	Enabled or Disabled. When enabled, an e-mail alert is sent each time an outlet action takes place.
	System On/Off	Enabled or Disabled. When enabled, an e-mail alert is sent each time the Switched ePDU completes booting up.
	Voltage/Current Threshold	Enabled or Disabled. When enabled, an e-mail alert is sent each time the measured voltage or current rises above the upper threshold or falls below the lower threshold (as set in the "Voltage/Current Threshold Setup" on page 49).
	Temperature Threshold	Enabled or Disabled. When enabled, an e-mail alert is sent each time the measured temperature for an enabled temperature sensor rises above the upper threshold or falls below the lower threshold (as set in the "Temperature Sensor Setup" on page 46).
	Humidity Threshold	Enabled or Disabled. When enabled, an e-mail alert is sent each time the measured humidity for an enabled humidity sensor rises above the upper threshold or falls below the lower threshold (as set in the "Humidity Sensor Setup" on page 47).
	Contact Threshold	Enabled or Disabled. When enabled, an e-mail alert is sent each time an enabled contact sensor changes state from Closed to Open or from Open to Closed.

Administrative Utilities

```

-- Administrative Utilities --
1- Update Firmware
2- Show Firmware version
3- Set System Defaults

-- Other Choices --
<b> = Back
<s> = Outlet/Environmental status

Select Item Number:

```

Update Firmware

The Switched ePDU features remotely upgradeable firmware. To upgrade the firmware, select the Update Firmware menu option and enter **y** to the “Continue with reboot and firmware update” prompt. The Switched ePDU reboots and all network connections are lost (including Telnet connections). If a Telnet client is used to initiate the firmware upgrade, wait approximately 45 seconds to allow time for the Switched ePDU to completely boot into the FTP application. The following is an example of the text over the serial interface:

```

-- Administrative Utilities --
1- Update Firmware
2- Show Firmware version
3- Set System Defaults

-- Other Choices --
<b> = Back
<s> = Outlet/Environmental status

Select Item Number: 1
-- FTP Download Utility --
The system will reboot and start the FTP Utility shortly
if you are NOT using a serial connection you will need to
reconnect the Telnet session after system reboot to follow
FTP progress.

Once the download of new firmware has completed the unit
will restart after 10 seconds.
Continue with reboot and firmware update (Y/N)?
y
- Decompressing Image into RAM, please wait...

```

```

Eaton Corporation
Power Distribution and Remote Management
Support and Sales:
Call: 1-800-843-9433
Email: sales@eaton.com
NET+WORKS Version 6.0
PLATFORM: ePDU3600
APPLICATION: Eaton FTP Server Application 1.0.1

```

NETWORK INTERFACE PARAMETERS:

```

IP address on LAN is 192.168.168.168
LAN interface's subnet mask is 255.255.255.0
IP address of default gateway to other networks is 192.9.200.254

```

HARDWARE PARAMETERS:

```

Serial channels will use a baud rate of 9600
This board's MAC Address is 00:04:F3:00:06:35
After board is reset, start-up code will wait 5 seconds
Default duplex setting for Ethernet connection: Half Duplex

```

NVRAM Format. START_OF_FREE_NVRAM=0x140

Press any key in 5 seconds to change these settings.

Eaton FTP Server ready.

At this point the FTP server is ready to receive the firmware upgrade. Using an FTP program, such as FTP Commander or the command line FTP program available with Microsoft Windows, connect to the Switched ePDU's IP address (port 21) with the Admin username and password (default is **ipc**), upload the image.bin file, and disconnect from the Switched ePDU. Once the FTP connection has been disconnected, the FTP server automatically reboots the Switched ePDU into the upgraded software application.



NOTE To ensure proper Switched ePDU operation of the upgraded application software, set the system defaults after upgrading the firmware. Select **Set System Defaults** under the Administrative Utilities menu.

Show Firmware Version

Selecting this menu option displays the current application firmware version.

Set System Defaults

To reset a Switched ePDU to its factory-default settings, select this menu option and follow the prompts.

Outlet-Environmental Status

```
-- Outlet State Sub Menu --

1- Outlet Section 1 (1-8)
2- Outlet Section 2 (9-16)
3- Outlet Section 3 (17-24)
4- Environmental Sensors

-- Other Choices --
<b> = Back
<s> = Outlet/Environmental status
```

Select Item Number:

This menu is available from the Main Menu as option 4 and also throughout much of the interface by pressing the [s] key. The number of sections are listed as they are present on the Switched ePDU.

Outlet Section

Selecting the option for any outlet section displays an outlet status screen:

```
-- Outlet Control Sub Menu --
Outlet Section 1 Measurements
Voltage: 121 V
Current: 0.0 A
Power: 0.0 VA

Outlet Name          Current State
-----
1 HP Server          On
2 PowerEdge Server   Off
3 Exchange Server    On
4 Disk Array 1       On
5 Switch 1           Off
6 Disk Array 2       On
7 Citrix Server      On
8 Backup Server      On

-- Other Choices --
<b> = Back
<s> = Outlet/Environmental status
<n> = Next outlet section
```

Select Item Number:

The measured voltage, measured current, and calculated apparent power are displayed at the top of the page. For all single-phase Switched ePDUs (8-outlet, 16-outlet, and some 24-outlet Switched ePDUs), these values correspond to what is measured for the displayed outlet section. For three-phase Switched ePDUs (most 24-outlet Switched ePDUs), these values are measurements of phase voltage and phase current and the calculated phase power; values displayed for section 1 correspond to phase X, those for section 2 correspond to phase Y, and those for section 3 correspond to phase Z. Be sure to read the label next to the measurements for an exact description.

Environmental Sensors

```

-- Sensor Display Main Menu --
Temperature 1: 73.90F
Temperature 2: 119.30F
Humidity 1: 22.8%
Switch 1: Open
Switch 2: Closed
Switch 3: Open
Any key to update display
<b> = Back

```

This menu option displays the current temperature, humidity, and contact sensors readings. Sensor measurements are updated every few seconds; press any key to refresh the screen with the latest measurements.

Choose Strapping Device

The following secondary devices are connected to this primary unit.

```

ID  Unit Name
--  -----
0   Switched ePDU
3   Switched ePDU3
4   Switched ePDU4

```

Note: Strapping connection may take 15 seconds to initialize.

Select Strapping Device:

Strapping is an advanced feature of the Switched ePDU. See Chapter 11, "Advanced Features" on page 89 for more information.

This page intentionally left blank.

Chapter 9

Switched ePDU Admin Using the Web Interface

The Web interface uses graphical navigation to view outlet status and logs, issue outlet commands, and change settings. This chapter describes this interface according to the menu on the left side of the Web page. For instructions on connecting to the Switched ePDU through the Web interface, see “Accessing the Web Interface” on page 13.



NOTE The number of outlets that display on the Web interface depends upon the Switched ePDU model you are connected to. The examples shown here may display a different number of outlets.

Unit Status

The Unit Status page (see Figure 15) functions as the Home page. The Unit Status page appears immediately after logging in and displays the current state of the Switched ePDU. See Table 16 for a list of some important items on this page.

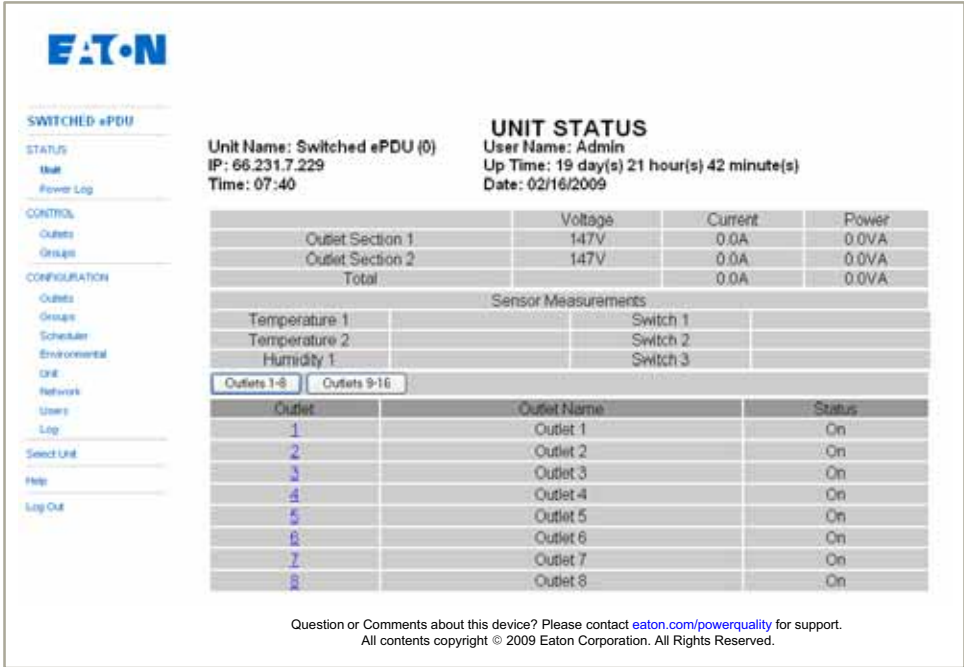


Figure 15. Unit Status Page (Home Page) (Typical)

Table 16. Unit Status Page

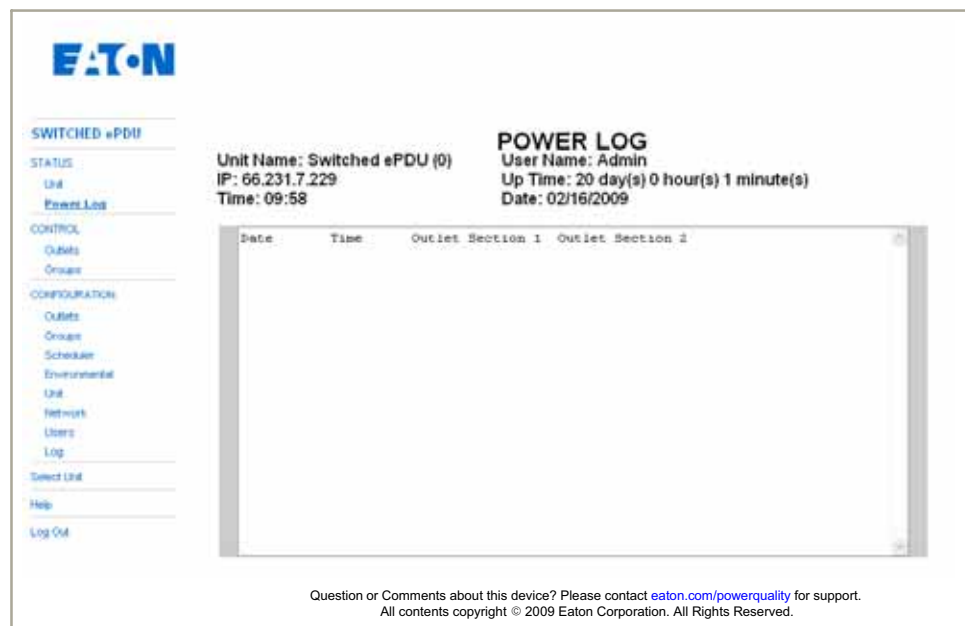
Field	Description
Unit Name	This field displays the Switched ePDU's name, and in parentheses it also gives the Switched ePDU's Strapping ID (important when using the strapping feature because it shows the ID of the Switched ePDU that is currently being navigated).
Outlets Section Buttons	The status for one outlet section at a time is displayed on the page. When connected to a 16- or 24-outlet Switched ePDU, buttons are present to switch to each of the additional sections.
Hyperlinked Outlet Numbers	Each outlet number can be set up with a hyperlink to a URL. Use this field as a convenient way to store a link to the Web-based configuration for a device connected to an outlet. The URL for each outlet can be customized in the Outlet Configuration page (see page 69).

Power Log

Power Log data is collected by multiplying the measured voltage and current to calculate the apparent power and recording the result at the Power Log Interval specified on the Unit Configuration page (see page 77). Up to 50 hours (60-minute time interval), 12 hours 30 minutes (15-minute time interval), or 4 hours 10 minutes (5-minute time interval) of history may be available at any time. See Figure 16.



NOTE Power Log data is maintained only while the Switched ePDU is in normal operation; all data is lost if the ePDU is rebooted or the power is disconnected.

**Figure 16. Power Log Page (Typical)**

Outlet Control

Outlet commands and global commands can be issued from the Outlet Control page (see Figure 17). See Table 17 for outlet control settings.

EATON

SWITCHED ePDU

STATUS
Unit
Power Log

CONTROL
Outlets
Groups

CONFIGURATION
Outlets
Groups
Scheduler
Environmental
Unit
Network
Users
Log

Select Unit
Help
Log Out

Unit Name: Switched ePDU (0)
IP: 66.231.7.229
Time: 10:00

OUTLET CONTROL
User Name: Admin
Up Time: 20 day(s) 0 hour(s) 3 minute(s)
Date: 02/16/2009

	Voltage	Current	Power
Outlet Section 1	146V	0.0A	0.0VA
Outlet Section 2	146V	0.0A	0.0VA
Total		0.0A	0.0VA

Sensor Measurements

Temperature 1	Switch 1
Temperature 2	Switch 2
Humidity 1	Switch 3

Outlets 1-8 Outlets 9-16

Outlet	Name	Command	Status
1	Outlet 1	No Change	On
2	Outlet 2	No Change	On
3	Outlet 3	Immediate On	On
4	Outlet 4	Immediate Off	On
5	Outlet 5	No Change	On
6	Outlet 6	No Change	On
7	Outlet 7	No Change	On
8	Outlet 8	No Change	On
All		No Change	

Send Commands

Question or Comments about this device? Please contact eaton.com/powerquality for support.
All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 17. Outlet Control Page (Typical)

Table 17. Outlet Control Settings

Field	Description
Outlet (individual outlets)	To issue an outlet command to one or more outlets, select one of the following from the Command list for each outlet: • Immediate On • Immediate Off • Reboot Commands can be issued to multiple outlets at one time. Repeat for each outlet to which you want to submit a command. Click Send Commands to initiate the commands.
Outlets (all outlets)	To issue a global command that applies to all outlets, select one of the following from the Command list for the "All" outlet: • Global On • Global Off • Sequence On • Sequence Off Click Send Commands to initiate the command.

Group Control

Groups of outlets can be set up in the Group Configuration page (see page 71) and can be controlled from this Group Control page (see Figure 18). A group command can be applied to one or more groups at a time.



Figure 18. Group Control Page (Typical)

Table 18. Group Control Settings

Field	Description
Group	To issue a group command to one or more groups, select one of the following from the Command list: • Immediate On • Immediate Off • Reboot Commands can be issued to multiple groups at one time. Repeat for each group to which you want to submit a command. Click Send Commands to initiate the commands.

Outlet Configuration

Outlets can be configured in the Outlet Configuration page (see Figure 19). Select the appropriate Outlets button to display the outlet section to be configured. See Table 19 for field descriptions.

Outlets Section Buttons

OUTLET CONFIGURATION

Unit Name: Switched ePDU (0) User Name: Admin
 IP: 66.231.7.229 Up Time: 20 day(s) 5 hour(s) 30 minute(s)
 Time: 15:27 Date: 02/16/2009

Outlet	Name	Ping	Link(URL)	Sequence	Reboot
1	Outlet 1	0.0.0.0	http://166.223.334.123	1	10
2	Outlet 2	0.0.0.0	http://	2	10
3	Outlet 3	0.0.0.0	http://	3	10
4	Outlet 4	0.0.0.0	http://	4	10
5	Outlet 5	0.0.0.0	http://	5	10
6	Outlet 6	0.0.0.0	http://	6	10
7	Outlet 7	0.0.0.0	http://	7	10
8	Outlet 8	0.0.0.0	http://	8	10

Outlet Startup Mode: Last State

Save Changes

Question or Comments about this device? Please contact eaton.com/powerquality for support.
 All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 19. Outlet Configuration Page (Typical)

Table 19. Outlet Configuration Page

Field	Description
Name	Outlet name (up to 20 characters). This setting is used to describe the outlet wherever it appears in the interface. NOTE If scheduled events or sensors are configured to control an outlet, changing the outlet name breaks the link and prevents the outlet from being controlled. Outlet name changes must be manually carried over to scheduled events and sensor-based outlet control.
Ping	Configures the outlet IP address for “watch mode.” If Ping is enabled and a valid Ping Interval is set in the Network Configuration page (see page 79), the Switched ePDU pings the IP address set up for this outlet according to the time specified by the Ping Interval. If there is no ping response, the outlet reboots. If the ping fails and the outlet reboots three times in a row, the ping feature for that outlet stops until the Switched ePDU reboots or the Ping Enabled setting is briefly set to Disabled and then back to Enabled.
Link (URL)	Any hyperlink up to 30 characters. This feature is designed for ease of accessing all of the devices attached to one Switched ePDU. After entering a Link, click the outlet number on the Home page to open a new browser window and navigate to this address. NOTE Based on the URL entered here, selecting an outlet number from the Home page opens a new browser window displaying the Web-based configuration page for the device connected to the outlet.

Table 19. Outlet Configuration Page (continued)

Field	Description
Sequence	Integers from 0 to 999 (in seconds). Outlets can be sequenced on or off using Global Sequence On and Global Sequence Off commands. Outlets can also be sequenced on when the Switched ePDU is powered up by changing the Outlet Startup Mode. Sequencing outlets is primarily used to reduce inrush currents, but it can also be customized using this Sequence setting to allow certain pieces of equipment to entirely boot up before others receive power. The value for the Sequence On command is the amount of time from when the command is issued until a particular outlet turns on. A Sequence Off command works backwards and first turns off the outlet with the largest Sequence value. If a Sequence value is 0, the status of that outlet cannot be changed by sequence commands.
Reboot	Integers from 0 to 999 (in seconds). This setting specifies the number of seconds that an outlet remains in the off state following a reboot command.
Outlet Startup Mode	Last State or Sequence. This setting refers to the outlet action to take when power is first connected to the Switched ePDU. When Last State is selected, the outlets that were on when the Switched ePDU lost power are turned on simultaneously shortly after power is restored. If Sequence is selected, the Switched ePDU initiates a Global Sequence On command after it boots up (there may be a 45-second delay from when power is restored to when outlets begin to turn on). The per-outlet Sequence setting on the Outlet Configuration page can be used to customize the outlet sequence pattern, as well as to exclude certain outlets from sequencing on.



NOTE Select **Save Changes** to apply the changes on the current view before selecting another set of outlets. Changing views without clicking **Save Changes** results in lost data.

Group Configuration

On the Group Configuration page, you can name a group and select the outlets to be a part of the group (see Figure 20). Select the appropriate Outlets section button to display the outlet section to be configured. See Table 20 for field descriptions.

Outlets Section Buttons


SWITCHED ePDU
STATUS
Unit
Power Log
CONTROL
Outlets
Groups
CONFIGURATION
Outlets
Groups
Scheduler
Environmental
Unit
Network
Users
Log
Select Unit
Help
Log Out

GROUP CONFIGURATION
Unit Name: Switched ePDU (0)
IP: 66.231.7.229
Time: 15:29
User Name: Admin
Up Time: 20 day(s) 5 hour(s) 32 minute(s)
Date: 02/16/2009

Outlets 1-8

Outlets 9-16

	Name	Outlet Access							
		1	2	3	4	5	6	7	8
1	GroupServers	☐	☐	☐	☐	☐	☐	☐	☐
2		☐	☐	☐	☐	☐	☐	☐	☐
3		☐	☐	☐	☐	☐	☐	☐	☐
4		☐	☐	☐	☐	☐	☐	☐	☐
5		☐	☐	☐	☐	☐	☐	☐	☐
6		☐	☐	☐	☐	☐	☐	☐	☐
7		☐	☐	☐	☐	☐	☐	☐	☐
8		☐	☐	☐	☐	☐	☐	☐	☐

Save Changes

Question or Comments about this device? Please contact eaton.com/powerquality for support.
All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 20. Group Configuration Page (Typical)

Table 20. Group Configuration Settings

Field	Description
Name	Up to 20 characters. Clear this field and click Save Changes to remove the group.
Outlet Access	Select the outlets to be included in each group.



NOTE To select outlets from an outlet section different from what is shown, first click **Save Changes** to store the changes on the current page, then use the Outlets section buttons to change to a different section. Changing sections without clicking **Save Changes** results in lost data.

Scheduler Configuration

The Scheduler page allows daily or weekly events to be set up for outlets or groups of outlets (see Figure 21). See Table 21 for field descriptions.



SWITCHED ePDU

STATUS

Unit

Power Log

CONTROL

Outlets

Groups

CONFIGURATION

Outlets

Groups

Scheduler

Environmental

Unit

Network

Users

Log

Select Unit

Help

Log Out

Unit Name: Switched ePDU (0)

IP: 66.231.7.229

Time: 15:31

SCHEDULER

User Name: Admin

Up Time: 20 day(s) 5 hour(s) 34 minute(s)

Date: 02/16/2009

	Outlet/Group	Command	Day/Week	Day	Time(24hr)
1	GroupServer	Reboot	Daily	None	06 : 00
2		No Change	Daily	None	
3		No Change	Daily	None	
4		No Change	Daily	None	
5		No Change	Daily	None	
6		No Change	Daily	None	
7		No Change	Daily	None	
8		No Change	Daily	None	
9		No Change	Daily	None	
10		No Change	Daily	None	

Save Changes

Question or Comments about this device? Please contact eaton.com/powerquality for support.

All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 21. Scheduler Page (Typical)

Table 21. Scheduler Settings

Field	Description
Outlet/Group	Type the exact name of an outlet or group, or clear this field and click Save Changes to remove an event. NOTE Names are case-sensitive.
Command	Select a command: • Immediate On • Immediate Off • Reboot
Day/Week	Outlet commands can be issued Daily or Weekly.
Day	If Day/Week is set to Daily, this option must be None. If Day/Week is set to Weekly, this option should be set to a day of the week.
Time (24hr)	Enter the time of day when the outlet/group command is issued.

Environmental Configuration

On the Environmental Configuration page (see Figure 22) you can:

- Configure the temperature and humidity thresholds for individual outlets or groups of outlets (see Table 22 for field descriptions).
- Enable or disable the contact switch for individual outlets or groups of outlets (see Table 23 for field descriptions).
- Set the high and low thresholds for voltage and current (see Table 24 for field descriptions).

EATON

SWITCHED ePDU

Unit Name: Switched ePDU (0) User Name: Admin
IP: 66.231.7.229 Up Time: 20 day(s) 5 hour(s) 38 minute(s)
Time: 15:35 Date: 02/16/2009

ENVIRONMENTAL CONFIGURATION

Temperature						
Name	Enabled	High Threshold	Low Threshold	Ctrl Outlet/Group	Outlet/Group Name	Outlet/Group To Off
Temperature 1	☐	21.2	32	☐		☐
Temperature 2	☐	21.2	32	☐		☐

Humidity						
Name	Enabled	High Threshold	Low Threshold	Ctrl Outlet/Group	Outlet/Group Name	Outlet/Group To Off
Humidity 1	☐	100	0	☐		☐

Contact Switch				
Name	Enabled	Ctrl Outlet/Group	Outlet/Group Name	Outlet/Group To Off
Switch 1	☐	☐		☐
Switch 2	☐	☐		☐
Switch 3	☐	☐		☐

Voltage and Current						
	High Voltage Threshold	Low Voltage Threshold	High Current Threshold	Low Current Threshold	Ctrl Outlet/Group	Outlet/Group Name
Outlets 1-8	210	95	25	0	☐	
Outlets 9-16	210	95	25	0	☐	

Save Changes

Question or Comments about this device? Please contact eaton.com/powerquality for support.
All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 22. Environmental Configuration (Typical)

Temperature and Humidity Settings

Temperature and humidity probes are available as accessories from your Eaton sales representative.

Switched ePDUs have four RJ-45 ports on the face, one of which is labeled “Temp J29”. This port supports three types of external probes:

- T1 probe (contains a temperature sensor wired to the Temperature 1 input)
- T1H1 probe (the same as T1 probe, plus a humidity sensor)
- T2 probe (contains a temperature sensor wired to the Temperature 2 input).

The T1 or T1H1 probe can be used simultaneously with a T2 probe by connecting them to the Temp port through an RJ-45 “Y” adapter (also available from Eaton). Contact your Eaton sales representative for more information.



NOTE If a temperature sensor is enabled in software but an actual sensor is not connected, a temperature reading of 121.1°C (249.9°F) displays. If a humidity sensor is enabled in the software but is not connected, a humidity reading of 100% displays.

Table 22. Temperature and Humidity Settings

Field	Description
Name	The name of the temperature or humidity sensor. Up to 20 characters. The sensor name displays in the interface and logs.
Enabled	Enabled must be selected before the readings can display.
High Threshold	When the readings cross above this threshold, e-mail alerts and/or SNMP traps are sent if configured to do so in the Log Manager and SNMP Settings configuration. Set Fahrenheit or Celsius in the Unit Configuration (see page 77).
Low Threshold	When the readings cross below this threshold, e-mail alerts and/or SNMP traps are sent if configured to do so on the Log Manager and SNMP Settings configuration. Set Fahrenheit or Celsius in the Unit Configuration page (see page 77).
Ctrl Outlet/Group	If the sensor is to report the temperature or humidity readings, set to No. If this setting is set to Yes, an outlet or group name must also be entered.
Outlet/Group Name	Up to 20 characters. NOTE Outlet and group names are case-sensitive. If an outlet or group name is later changed, control from the sensors does not work until they are reconfigured with the new name.
Outlet/Group to ON	If the Outlet/Group to ON check box is selected, the outlet or group turns on when the temperature or humidity is above the upper threshold or below the lower threshold; the outlet or group turns off when the temperature or humidity is between the upper and lower thresholds. If the Outlet/Group to ON check box is clear, the outlet or group turns off when the temperature or humidity is above the upper threshold or below the lower threshold; the outlet or group turns on when the temperature or humidity is between the upper and lower thresholds.

Contact Switch Settings

Switched ePDUs have four RJ-45 ports on the face, one of which is labeled “Switch”. This port supports three external contact closures that can be either **Open** or **Closed**. See “Contact Sensor Wiring” on page 94 for detailed information.

After connecting a contact, the appropriate sensor must be enabled in software. If a contact closure is enabled but an actual switch or sensor is not connected, the contact state displays as Open. Contact closures can also be set up to control outlets or groups based on their state.

Table 23. Contact Switch Settings

Field	Description
Name	The name of the contact switch sensor. Up to 20 characters can be used to describe the sensor.
Enabled	The Enabled check box must be selected before the contact state displays.
Ctrl Outlet/Group	If the sensor is to report only the contact sensor status, clear the check box. If the check box is selected, an outlet or group name is required.
Outlet/Group Name	Up to 20 characters. NOTE Outlet and group names are case-sensitive. If an outlet or group name is later changed, control from the contact closures does not work until they are reconfigured with the new name.
Outlet/Group to ON	If the Outlet/Group to ON check box is selected, the outlet or group turns on when the contact state is Closed; the outlet or group also turns off when the contact state is Open. If the Outlet/Group to ON check box is clear, the outlet or group turns off when the contact state is Open; the outlet or group also turns on when the contact state is Closed.

Voltage and Current Settings

Each voltage and current measurement can be configured to have both a lower and upper voltage and current threshold. For all single-phase Switched ePDUs (8-outlet, 16-outlet, and some 24-outlet Switched ePDUs), these thresholds correspond to what is measured for each outlet section. For all three-phase Switched ePDUs (most 24-outlet Switched ePDUs), these thresholds are for phase voltage and phase current; thresholds for section 1 correspond to phase X, those for section 2 correspond to phase Y, and those for section 3 correspond to phase Z. Be sure to read the label next to the measurements for an exact description.

Table 24. Voltage and Current Settings

Field	Description
High Voltage Threshold	When the voltage measurement crosses above the upper threshold or below the lower threshold, e-mail alerts and/or SNMP traps may be sent, depending on the Log Manager and SNMP Settings configuration.
Low Voltage Threshold	
High Current Threshold	When the current measurement crosses above the upper threshold or below the lower threshold, e-mail alerts and/or SNMP traps may be sent, depending on the Log Manager and SNMP Settings configuration).
Low Current Threshold	
Ctrl Outlet/Group	If the thresholds are not being used, or if they are needed only to report a possible power problem, the Ctrl Outlet/Group check box should be clear. If the Ctrl Outlet/Group check box is selected, an outlet or group name must also be entered. The selected outlet or group turns off when the voltage or current goes above the upper threshold or below the lower threshold. The outlet or group does not turn back on when the voltage or current returns to a value between the two thresholds.
Outlet/Group Name	Up to 20 characters. NOTE Outlet and group names are case-sensitive. If an outlet or group name is later changed, control from the voltage and current measurements does not work until they are reconfigured with the new name.

Unit Configuration

On the Unit Configuration page (see Figure 23) you can apply changes to the Switched ePDU, such as naming the unit, changing the password, and setting the inactivity timeout period. See Table 25 for unit configuration field descriptions and Table 26 for advanced options field descriptions.

EATON

SWITCHED ePDU

UNIT CONFIGURATION

Unit Name: Switched ePDU (0) User Name: Admin
 IP: 66.231.7.229 Up Time: 20 day(s) 5 hour(s) 40 minute(s)
 Time: 15:37 Date: 02/16/2009

Unit Configuration		
Firmware Revision	2.0.J	
Unit Name	Switched ePDU	
Strapping ID	0	(0 = Primary Unit)
Admin User Name	Admin	
Admin Password	****	
Unit Time	15:37	(15:30)
Unit Date	02/16/2009	(04/15/2004)
Unit Day of Week	Monday	
Power Log Interval	Disabled	
Keyboard Timeout	300	
Invert Display	☐	
Fahrenheit or Celsius	☒ F ☐ C	

Save Changes

Advanced Options

Soft Reboot Reset to Defaults Update Firmware

Note: All three of these options will cause the unit to reboot. Rebooting will not affect the outlet state.

Question or Comments about this device? Please contact eaton.com/powerquality for support.
 All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 23. Unit Configuration Page (Typical)

Table 25. Unit Configuration Settings

Field	Description
Firmware Revision	Firmware version installed on the Switched ePDU.
Unit Name	Switched ePDU name. Up to 20 characters. The unit name displays in the interface and logs.
Strapping ID	Each Switched ePDU connected together on a strapping bus must have a unique strapping ID. The Switched ePDU with a strapping ID of 0 is the primary (or master) Switched ePDU, and those with strapping IDs of 1 to 23 are secondary (or slave) Switched ePDUs. See “Advanced Boot Configuration” on page 91 for information on changing the strapping ID.
Admin User Name	Cannot be changed from the default Admin (case-sensitive).
Admin Password	The default Admin password is ipc (case-sensitive). The password can be modified using any combination of a–z, A–Z, and 0–9 characters and must be from 1 to 20 characters in length.
Unit Time	Time is stored using 24-hour format. For example, enter 5:20 p.m. as 17:20.
Unit Date	Dates are stored in mm/dd/yyyy format.
Unit Day of Week	Select the day of the week that matches the date. This setting is important when scheduling events and sending logs.

Table 25. Unit Configuration Settings (continued)

Field	Description
Power Log Interval	Options are 5 minutes, 15 minutes, 60 minutes, or disabled. The Power Log tool multiplies the measured voltage and current to calculate the apparent power and records the result at the interval specified by this setting. When set to disabled, the Power Log does not record the apparent power values.
Keyboard Timeout	Enter any integer between 30 and 999 seconds. This setting refers to the length of inactivity before a user is automatically logged off. The default is 300 seconds.
Invert Display	Normal or Inverted. The meter display on the face of the Switched ePDU displays the current for each outlet section or phase. These readings can be inverted for easier reading depending on the ePDU's mounting orientation.
Fahrenheit or Celsius	Fahrenheit or Celsius. This setting displays temperature readings from an external temperature probe.

Table 26. Advanced Options

Field	Description
Soft Reboot	To reboot the Switched ePDU, select this option and click Save Changes. The outlet state is not changed during a soft reboot.
Reset to Defaults	Select this option and click Save Changes to reset the Switched ePDU to its factory-default settings. All settings are reset except the IP address, subnet mask, and default gateway.
Update Firmware	At this point the FTP server is ready to receive the firmware upgrade. Using an FTP program, such as FTP Commander or the command line FTP program available with Microsoft Windows, connect to the Switched ePDU's IP address (port 21) with the Admin username and password (default is ipc), upload the image.bin file, and disconnect from the Switched ePDU. Once the FTP connection has been disconnected, the FTP server automatically reboots the Switched ePDU into the upgraded software application. <i>NOTE To ensure proper Switched ePDU operation of the upgraded application software, set the system defaults after upgrading the firmware. Select Set System Defaults under the Administrative Utilities menu.</i>

Network Configuration

On the Network Configuration page you can configure the Switched ePDU communications (see Figure 24). See Table 27 for network configuration field descriptions.

EATON

SWITCHED ePDU

STATUS
Unit
Power Log

CONTROL
Outlets
Groups

CONFIGURATION
Outlets
Groups
Scheduler
Environmental
Unit
Network
Users
Log
Select Unit
Web
Log Out

Unit Name: Switched ePDU (0)
IP: 66.231.7.229
Time: 15:42

User Name: Admin
Up Time: 20 day(s) 5 hour(s) 45 minute(s)
Date: 02/16/2009

NETWORK CONFIGURATION

Network Settings	
*Use DHCP	☐
*Unit IP Address	66.231.7.229
*Subnet Mask	255.255.255.240
*Default Gateway	66.231.7.225
MAC Address	00:04:F3:00:36:C2

Serial Settings	
*Baud Rate	9600
Data bits	8
Parity	None
Stop bits	1
Flow Control	None

Telnet Settings	
*Enable Access	☒
*Port	23

Web Settings	
*Enable Access	☒
*Port	80
*Enable Secure Web	☐
Secure Web Port	443

Ping Settings	
Enable Ping	☐
Ping Interval	60

SNMP Settings	
*Public Community Name	public
*Private Community Name	private
*Trap Community Name	public
Trap IP Address	0.0.0.0
*SNMP Enabled	Disabled
Trap User Login/Logout	☐
Trap Failed Login Attempt	☐
Trap Outlet Activity	☐
Trap System On/Off	☐
Trap Voltage/Current Threshold	☐
Trap Temperature Threshold	☐
Trap Humidity Threshold	☐
Trap Contact Closure Threshold	☐

(*) - Require a soft reboot to take effect.

Save Changes

Question or Comments about this device? Please contact eaton.com/powerquality for support.
All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 24. Network Configuration Page (Typical)

Table 27. Network Configuration Settings

Section	Field	Description
Network Settings	Use DHCP*	Select the Use DHCP check box to enable DHCP or clear the check box to disable. If DHCP is enabled, the IP address, subnet mask, and default gateway values are obtained from the network DHCP server, and these obtained values overwrite whatever static settings have been entered. If DHCP is disabled, the static IP address, subnet mask, and default gateway values entered below are used to communicate on the network.
	Unit IP Address*	Enter in standard dot notation (for example, 192.168.168.168).
	Subnet Mask*	Enter in standard dot notation (for example, 255.255.255.0).
	Default Gateway*	Enter in standard dot notation (for example, 192.168.168.1).
	MAC Address	This value is unique to this Switched ePDU and cannot be changed from this page. If customization is necessary, see "Advanced Boot Configuration" on page 91 for instructions.
Serial Settings	Baud Rate*	9600, 19200, or 38400 baud (default is 9600). All other serial settings are fixed at 8 data bits, no parity, 1 stop bit, and no flow control.
	Data bits	Cannot be changed from this page.
	Stop bits	Cannot be changed from this page.
	Flow control	Cannot be changed from this page.
Telnet Settings	Enable Access*	Select the Telnet Enable Access check box to enable.
	Port*	Telnet port, any integer from 1 to 65535 (default is 23).
Web Settings	Enable Access*	Select the Web Enable Access check box to enable.
	Port*	Web port, any integer from 1 to 65535 (default is 80). The Web Port setting only affects Web access when the Enable Secure Web check box is clear.
	Enable Secure Web*	Select the Web Enable Secure Web check box to enable. Each time the Switched ePDU reboots (or power is applied to the Switched ePDU when the Secure Web is enabled), the boot process takes up to five minutes to generate a new secure server certificate. During this time the Switched ePDU is unavailable from all interfaces, and outlet operations, such as power on sequencing, is delayed until the certificate is generated (the boot process can be monitored over a serial connection). After the Switched ePDU reboots, the secure Web interface is available at port 443 (this port number is fixed) using the secure URL format (for example, https://192.168.168.168).
	Secure Web Port	Fixed port number for the Web interface.
Ping Settings	Enable Ping	Select the Enable Ping check box to enable the Switched ePDU to ping the IP address set up for each outlet (see Outlet Configuration) according to the time specified in the Ping Interval field. Changes take effect immediately. If there is no ping response, the outlet reboots. If the ping fails and the outlet reboots three times in a row, the ping feature for that outlet stops until the Switched ePDU reboots or the Enable Ping check box is cleared and then reselected.
	Ping Interval	Any integer from 5 to 60 minutes; changes take effect immediately.

* Requires a soft reboot to take effect (select Soft Reboot from the Unit Configuration page, then click Save Changes).

Table 27. Network Configuration Settings (continued)

Section	Field	Description
SNMP Settings	Public Community Name*	Up to 20 characters long (default is “public”).
	Private Community Name*	Up to 20 characters long (default is “private”).
	Trap Community Name*	Up to 20 characters long (default is “public”).
	Trap IP Address	Enter in standard dot notation (for example, 192.168.168.100). All traps are sent to this address at port 161.
	SNMP Enabled*	Enabled or Disabled. When running, the SNMP server is bound to port 162.
	Trap User Login/Logout	Select the Trap User Login/Logout check box to enable a trap to be sent to the Trap IP Address each time a user logs in to or logs out of the serial, Telnet, or Web interfaces.
	Trap Failed Login Attempt	Select the Trap Failed Login Attempt check box to enable a trap to be sent to the Trap IP Address when a user fails to log in three times in a row with an invalid username or password to the serial, Telnet, or Web interfaces.
	Trap Outlet Activity	Select the Trap Outlet Activity check box to enable a trap to be sent to the Trap IP Address each time an outlet action takes place.
	Trap System On/Off	Select the Trap System On/Off check box to enable a trap to be sent to the Trap IP Address each time the ePDU completes booting up.
	Trap Voltage/Current Threshold	Select the Trap Voltage/Current Threshold check box to enable a trap to be sent to the Trap IP Address each time the measured voltage or current rises above the upper threshold or falls below the lower threshold (as set in the Power Monitor Setup on the Environmental Configuration page).
	Trap Temperature Threshold	Select the Trap Temperature Threshold check box to enable a trap to be sent to the Trap IP Address each time the measured temperature for an enabled temperature sensor rises above the upper threshold or falls below the lower threshold (as set in the Temperature Sensor Setup on the Environmental Configuration page).
	Trap Humidity Threshold	Select the Trap Humidity Threshold check box to enable a trap to be sent to the Trap IP Address each time the measured humidity for an enabled humidity sensor rises above the upper threshold or falls below the lower threshold (as set in the Humidity Sensor Setup on the Environmental Configuration page).
	Trap Contact Closure Threshold	Select the Trap Contact Closure Threshold check box to enable a trap to be sent to the Trap IP Address each time an enabled contact sensor changes state from Closed to Open or from Open to Closed.

* Requires a soft reboot to take effect (select Soft Reboot from the Unit Configuration page, then click Save Changes).

User Configuration

Up to 11 non-Admin users can be set up with separate user accounts and access rights. Non-admin users can log in to the serial, Telnet, and Web interfaces, but they have limited access. The menus available allow the non-Admin user to view only outlet and environmental status and control outlets to which the user has been given access. See Figure 25 for an example of the User Configuration page and Table 28 for a description of the fields.

SWITCHED ePDU

STATUS

Unit

Power Log

CONTROL

Outlets

Groups

CONFIGURATION

Outlets

Groups

Scheduler

Environmental

Unit

Network

Users

Log

Select Unit

Help

Log Out

USER CONFIGURATION

Unit Name: Switched ePDU (0)

IP: 66.231.7.229

Time: 15:50

User Name: Admin

Up Time: 20 day(s) 5 hour(s) 53 minute(s)

Date: 02/16/2009

Outlets 1-8

Outlets 9-16

	User Name	User Password	User Enabled	Outlet Access							
				1	2	3	4	5	6	7	8
1	Jack Jones	*****	☒	☒	☒	☒	☒	☒	☒	☒	☒
2			☐	☐	☐	☐	☐	☐	☐	☐	☐
3			☐	☐	☐	☐	☐	☐	☐	☐	☐
4			☐	☐	☐	☐	☐	☐	☐	☐	☐
5			☐	☐	☐	☐	☐	☐	☐	☐	☐
6			☐	☐	☐	☐	☐	☐	☐	☐	☐
7			☐	☐	☐	☐	☐	☐	☐	☐	☐
8			☐	☐	☐	☐	☐	☐	☐	☐	☐
9			☐	☐	☐	☐	☐	☐	☐	☐	☐
10			☐	☐	☐	☐	☐	☐	☐	☐	☐
11			☐	☐	☐	☐	☐	☐	☐	☐	☐

Save Changes

Question or Comments about this device? Please contact eaton.com/powerquality for support.

All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 25. User Configuration Page (Typical)

Table 28. User Configuration Settings

Field	Description
User Name	Up to 20 characters. Clear this field and click Save Changes to remove a user.
User Password	One to 20 characters. Only letters and numbers (a–z, A–Z, and 0–9) can be used.
User Enabled	Select the User Enabled check box to activate the user account. If this check box is not selected, the user account is created with the login disabled.
Outlet Access	Select the outlets that the user can view status of and control.



NOTE To select outlets from an outlet section different from what is shown, click **Save Changes** to store the changes on the current page, then use the Outlet section buttons to change to a different section. Changing sections without clicking **Save Changes** results in lost data.

Log Configuration

The Log Configuration page contains all settings related to logs and alerts (see Figure 26). Logs are kept of the items selected under Events To Log and sent by e-mail either on a periodic basis or every time the log is full. Alerts are also enabled for the items selected under Alerts To Send and are sent immediately after the event occurs. Both logs and alerts are sent through e-mail only and cannot be viewed from any of the user interfaces. See Table 29 for a description of the Log Configuration fields.

EATON

SWITCHED ePDU

STATUS
Unit
Power Log

CONTROL
Outlets
Groups

CONFIGURATION
Outlets
Groups
Scheduler
Environmental
Unit
Network
Users
Log

Select Unit

Help
Log Out

LOG CONFIGURATION

Unit Name: Josiah (0)
IP: 166.99.182.214
Time: 12:23

User Name: Admin
Up Time: 1 day(s) 0 hour(s) 31 minute(s)
Date: 02/18/2009

Sending the Log

Mail Server: 0.0.0.0 (IP Address)

Sending Log To 1: (E-Mail Address)

Sending Log To 2: (E-Mail Address)

Send Alerts To 1: (E-Mail Address)

Send Alerts To 2: (E-Mail Address)

Send Log From: ePDU@eaton.com (E-Mail Address)

Send Log: Weekly

Day: Monday

Time: 07 : 00

Events To Log	Alerts To Send
User Login/Logout ☐	User Login/Logout ☐
Failed Login Attempt ☐	Failed Login Attempt ☐
Outlet Activity ☐	Outlet Activity ☐
System Off/On ☐	System Off/On ☐
	Voltage/Current Threshold ☐
	Temperature Threshold ☐
	Humidity Threshold ☐
	Contact Closure Threshold ☐

Save Changes

Question or Comments about this device? Please contact eaton.com/powerquality for support.
All contents copyright © 2009 Eaton Corporation. All Rights Reserved.

Figure 26. Log Configuration Page (Typical)

Table 29. Log Configuration Settings

Section	Field	Description
Sending the Log	Mail Server	Enter standard dot notation (for example, 192.168.168.1). All e-mail is sent through this server using the SMTP protocol.
	Send Log To 1	Up to 30 characters. Specifies an e-mail address where all logs are to be sent.
	Send Log To 2	Up to 30 characters. Specifies a second e-mail address where all logs are to be sent.
	Send Alerts To 1	Up to 30 characters. Specifies an e-mail address where all alerts are to be sent.
	Send Alerts To 2	Up to 30 characters. Specifies a second e-mail address where all alerts to be sent to.
	Send Log From	Up to 30 characters. Specifies the e-mail address from which the logs and alerts are sent. This setting appears as the “From” e-mail address in all sent e-mail messages
	Send Log	Options for how often logs sent: • Daily (every day) • Weekly (once a week) • When Full (only when the log buffer is full) NOTE Logs are sent when the log buffer reaches capacity even if Daily or Weekly is selected for the Send Log option (the log buffer holds approximately 70 events).
	Day	If Send Log is set to Weekly, select a day of the week to send the log. Options are: • Sunday • Monday • Tuesday • Wednesday • Thursday • Friday • Saturday • No Day (select this option if Send Log is set to Daily or When Full)
Events to Log	Time	Enter in the 24-hour format. This setting is only meaningful if Send Log is set to Daily or Weekly. It is used to select the time of day to send the log.
	User Login/Logout	Select the User Login/Logout check box to have an entry added to the log each time a user fails to log in three times in a row with an invalid username or password to the serial, Telnet, or Web interfaces.
	Failed Login Attempt	Select the Failed Login Attempt check box to have an entry added to the log when a user fails to log in three times in a row with an invalid username or password to the serial, Telnet, or Web interfaces.
	Outlet Activity	Select the Outlet Activity check box to have an entry added to the log each time an outlet action occurs.
	System Off/On	Select the System Off/On check box to have an entry added to the log each time the Switched ePDU completes booting up.

Table 29. Log Configuration Settings (continued)

Section	Field	Description
Alerts to Send	User Login/Logout	Select the User Login/Logout check box to have an e-mail alert sent each time a user logs in to or logs out of the serial, Telnet, or Web interfaces.
	Failed Login Attempt	Select the Failed Login Attempt check box to have an e-mail alert sent when a user fails to log in three times in a row with an invalid username or password to the serial, Telnet, or Web interfaces.
	Outlet Activity	Select the Outlet Activity check box to have an e-mail alert sent each time an outlet action takes place.
	System Off/On	Select the System Off/On check box to have an e-mail alert sent each time the Switched ePDU completes booting up.
	Voltage/Current Threshold	Select the Voltage/Current Threshold check box to have an e-mail alert sent each time the measured voltage or current rises above the upper threshold or falls below the lower threshold (as set in the Power Monitor Setup on the Environmental Configuration page).
	Temperature Threshold	Select the Temperature Threshold check box to have an e-mail alert sent each time the measured temperature for an enabled temperature sensor rises above the upper threshold or falls below the lower threshold (as set in the Temperature Sensor Setup on the Environmental Configuration page).
	Humidity Threshold	Select the Humidity Threshold check box to have an e-mail alert sent each time the measured humidity for an enabled humidity sensor rises above the upper threshold or falls below the lower threshold (as set in the Humidity Sensor Setup on the Environmental Configuration page).
	Contact Closure Threshold	Select the Contact Closure Threshold check box to have an e-mail alert sent each time an enabled contact sensor changes state from Closed to Open or from Open to Closed.

Select Strapping Unit

Strapping is an advanced feature of the Switched ePDU. See “Strapping” on page 89 for more information.

EATON

SWITCHED ePDU

STATUS
Unit
Power Log

CONTROL
Outlets
Groups

CONFIGURATION
Outlets
Groups
Scheduler
Environmental
Unit
Network
Users
Log

Select Unit
Help
Log Out

SELECT STRAPPING UNIT

Unit Name: Josiah (0)
IP: 166.99.182.214
Time: 12:26

User Name: Admin
Up Time: 1 day(s) 0 hour(s) 31 minute(s)
Date: 02/18/2009

Unit ID	Unit Name
0	Primary Unit

Select Strapping ID:

Note: Strapping connection may take 15 seconds to initialize.

Question or Comments about this device? Please contact eaton.com/powerquality for support.
All contents copyright © 2008 Eaton Corporation. All Rights Reserved.

Figure 27. Select Strapping Unit Page (Typical)

This page intentionally left blank.

Chapter 10

Switched ePDU Admin Using the SNMP Interface

The Switched ePDU SNMP interface conforms to version 2c of the SNMP protocol. To use this interface, the Switched ePDU must first have valid network settings and be accessible from one other interface (serial, Telnet, or Web) for setup purposes. A MIB file for a Switched ePDU should also be downloaded from www.eaton.com/powerquality.

SNMP is disabled by default. The Admin user can enable SNMP and configure community settings. See “Network Settings” on page 52 to change the settings from the serial or Telnet interface or “Network Configuration” on page 79 to change the settings from the Web interface.

SNMP traps can also be configured from the same menu or Web page. Once SNMP is enabled and the Switched ePDU has been rebooted (a soft reboot is required after changing this setting), the Switched ePDU responds to SNMP requests over the network interface on port 161.

This page intentionally left blank.

Chapter 11

Switched ePDU Advanced Features

This chapter explains the following advanced features of the Switched ePDU:

- Strapping (connecting Switched ePDUs together)
- Advanced boot configuration
- Contact sensor wiring
- Recovering from a lost password

Strapping

Strapping is an advanced feature of the Switched ePDU that enables you to connect up to 24 Switched ePDUs together under one common network address using RS-485 serial communication. Strapping allows for control of up to 576 outlets through one interface.

The strapping feature applies to Switched ePDU models that have four RJ-45 ports on the face, two of which are marked “Strapping” (see Figure 28). Up to 24 Switched ePDUs can be strapped together using lengths of straight-through Ethernet cable (rated Category 5, 5e, or 6) with RJ-45 connectors on both ends. One Switched ePDU is designated the primary (master) Switched ePDU, and all the other secondary (slave) ePDUs are accessible through the primary's serial, Telnet, or Web interface. Strapping is useful in situations where IP addresses are limited or where all Switched ePDUs need to be controlled from one serial interface.

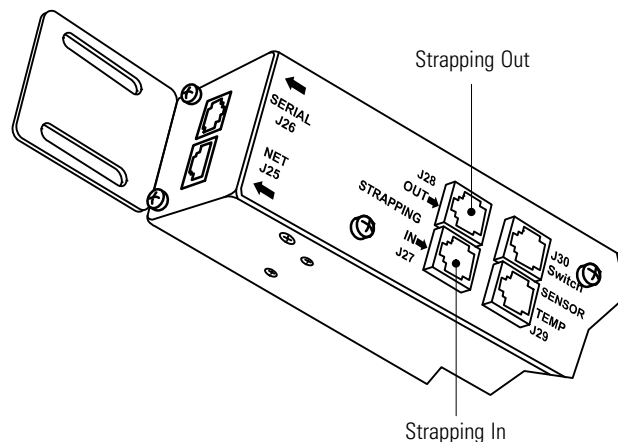


Figure 28. Strapping Ports (Typical)

After initiating a strapping connection to a secondary (slave) Switched ePDU, all of the primary (master) Switched ePDU's serial, Telnet, and Web interface pages change to present the secondary Switched ePDU's state and configuration. From the interface it is easy to view the secondary Switched ePDU's outlet status, control an outlet or group of outlets, schedule outlet events, view the Power Log, and check sensor or switch closure status.

There are some communication limitations due to the lack of Ethernet connectivity. Because secondary Switched ePDUs are not connected directly to the network, some functionality is disabled, including the Web interface, the Telnet interface, the SNMP interface, SNMP traps, and e-mail logs and alerts. Authentication is done solely through the primary Switched ePDU, and only the primary Switched ePDU's Admin user has the ability to use strapping.

Also the secondary ePDUs cannot be accessed through the master's SNMP interface, and SNMP traps and log events/alerts are not able to be sent for alarms that might occur on the secondary unit.

To set up strapping:

1. Determine the Strapping IDs of the Switched ePDUs. The primary (master) Switched ePDU must have a Strapping ID of 0, and secondary Switched ePDUs can have IDs between 1 and 23. Follow the steps in "Advanced Boot Configuration" on page 91 to set up each Switched ePDU with the appropriate Strapping ID.



NOTE Confirm that no two Switched ePDUs have the same strapping ID or strapping will not work correctly.

2. Connect a straight-through Ethernet cable (rated Category 5, 5e, or 6) between the RJ-45 receptacle labeled Strapping Out on one Switched ePDU to the RJ-45 receptacle labeled Strapping In on another Switched ePDU. Strap all the Switched ePDUs together by daisy-chaining them in this manner.
3. Wait 5 to 10 minutes to allow the primary Switched ePDU to discover all of the secondary Switched ePDUs.
4. **Serial or Telnet interface.** Log in to the primary Switched ePDU as the Admin user and select the **Choose Strapping Device** menu option. The Switched ePDU displays a list with the Strapping IDs and Switched ePDU names of all the secondary Switched ePDUs connected to the strapping bus.
5. **Web interface.** Log in to the primary Switched ePDU as the Admin user and select the **Select Unit** menu option. The Switched ePDU displays a list with the Strapping IDs and Switched ePDU names of all the secondary Switched ePDUs connected to the strapping bus.
6. To connect to a secondary Switched ePDU, enter the Strapping ID of any secondary Switched ePDU. The strapping connection may take 30 seconds to load all the settings and data from the secondary Switched ePDU to the primary Switched ePDU.



NOTE Status and measurement data are not dynamically updated during the strapping session. The strapping connection must be reinitialized to update status information.

Once the connection has been initialized, all of the menu options display the secondary Switched ePDU's data.

7. To return to the primary Switched ePDU, select **Select Strapping Device** and enter a Strapping ID of 0.

Advanced Boot Configuration

The Switched ePDU offers advanced configuration options using the serial interface.

To access these options:

1. Establish a serial connection to the Switched ePDU (follow the steps in Chapter 7, "Initial Configuration" on page 27).
2. If the Switched ePDU is connected to a power source, log in and go to the Main Menu, then select option **6** to do a Soft Reboot. If the Switched ePDU does not have power, connect it to a power source.
3. As the Switched ePDU boots, it should display the following text. At the prompt to "Press any key in 5 seconds to change these settings," quickly press the **m** key.

```
Bootloader Version 1.0.B
■ Decompressing Image into RAM, please wait...
```

```
Eaton Corporation
Data Center Solutions ■ Eaton
Support and Sales:
Call: 1-800-843-9433
Email: powerquality@eaton.com
NET+WORKS Version 6.0
PLATFORM: ePDU3600
APPLICATION: Eaton Switched ePDU Firmware 2.0.H
```

NETWORK INTERFACE PARAMETERS:

```
IP address on LAN is 166.99.182.215
LAN interface`s subnet mask is 255.255.255.0
IP address of default gateway to other networks is 166.99.182.250
```

HARDWARE PARAMETERS:

```
Serial channels will use a baud rate of 9600
This board`s MAC Address is 00:04:F3:00:06:35
After board is reset, start-up code will wait 5 seconds
Default duplex setting for Ethernet connection: Half Duplex
The unit is configured for 16 outlets
Resetting system defaults: No
Strapping ID: 0
```

```
FS=FORTH NVRAM Format. START_OF_FREE_NVRAM=0x140
```

```
Press any key in 5 seconds to change these settings.
```

4. To enter the boot setup, press the **m** key again to modify the settings. The Switched ePDU prompts you for the root password. This password is the same as the Admin password (the default is **ipc**).
5. The Switched ePDU prompts you to confirm each one of the advanced settings.

The previous value for most of the settings is included at the end of the prompt between [braces]. Press [Enter] at the prompt to accept the previous setting. Table 30 describes the settings in the following sample menu.

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

Enter the root password: ***

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]

Static IP address [166.99.182.215]?

Subnet Mask IP address [255.255.255.0]?

Gateway address IP address [166.99.182.250]?

SECURITY PARAMETERS:

Would you like to update the Root Password? [N]

HARDWARE PARAMETERS:

Set the baud rate of Serial channels [9600]?

The new baud rate is 9600

The baud rate will be changed on next power up

Please set the baud rate for your terminal accordingly

Each development board must have a unique Ethernet MAC address.

Set the board's Ethernet MAC Address [00:04:F3:00:06:35]?

How long (in seconds) should CPU delay before starting up [5]?

Normally the board will automatically negotiate with the network hub (or switch) to determine the Ethernet duplex setting, however some hubs do not support autonegotiation. In this case, the Ethernet driver can force the PHY to half duplex, force it to full duplex, or allow the PHY to use its default setting (usually half duplex).

Default Ethernet duplex setting (Full, Half, or phy Default)? [Half Duplex]

Reset system defaults (Y/N)?

n

Make selection for the number of Outlets (1-4):

1. 8 Outlets

2. 16 Outlets

3. 24 Outlets Single Phase

4. 24 Outlets Three Phase

: 4

The unit has been configured as a 24 outlet three phase system.

Enter the unit's Strapping ID (0 = Primary 1-23 = Secondary):

0

This device can reboot into an FTP server application which allows new firmware to be uploaded. This feature should ONLY be used if new firmware is actually going to be loaded.

Reboot to FTP Server (Y/N)?n

Saving the changes in NV memory...Done.

Table 30. Settings Description

Parameter Type	Description
Network Interface Parameters	These parameters include whether DHCP is enabled, as well as the static IP address, subnet mask, and default gateway values. These parameters are also available from the Network Settings menu.
Security Parameters	The root password is the same as the Admin password. Changing the root password here also changes the Admin password.
Hardware Parameters	The serial port baud rate can be changed to 9600, 19200, or 38400. The MAC address must be a unique number on your network; if the MAC address needs to be changed, it can be modified here. By default the CPU delays for 5 seconds to allow the user a chance to press any key to enter this boot setup; this delay time can be lengthened or shortened. Normally the Ethernet port auto-negotiates with the hub or switch, but the duplex setting is used if auto-negotiation fails.
Reset System Defaults	Resetting to defaults restores all settings (except the DHCP, IP address, subnet mask, and default gateway settings) to factory defaults.
Select the Number of Outlets	Select the number of outlets that are present on your Switched ePDU.
Strapping ID	This setting is the most important part of configuring strapping. Each Switched ePDU connected together on a strapping bus must have a unique strapping ID. The Switched ePDU with a strapping ID of 0 is the primary (or master) Switched ePDU, and those with strapping IDs of 1 to 23 are secondary (or slave) Switched ePDUs.
Reboot to FTP Server	Select Y only when loading new firmware. The Switched ePDU reboots into the FTP loader application after making this selection.

Contact Sensor Wiring

Switched ePDUs have four RJ-45 ports on the face, one of which is labeled “Switch.” This port supports three external contact closures that are sensed as being either open or closed. These inputs can be connected to a mechanical switch or any sensor with an electrically isolated switch output, such as a cabinet door or water sensor.

An 8-conductor cable connected to an 8-pin RJ-45 connector can be used to break out the wires from the port labeled “Switch” according to the wiring diagram below. The color codes correspond to a straight-through Category 5 Ethernet cable with standard T568A or T568B wiring. See Figure 29 and Table 31 for pin position and wiring.

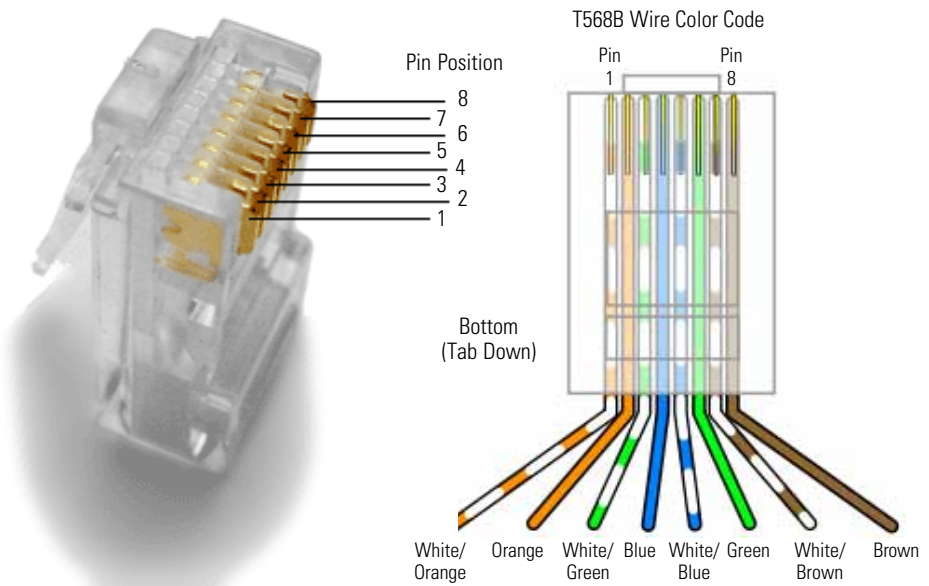


Figure 29. Pin Position and Color Code

Table 31. Wiring

Pin Number	T568A Wire Color	T568B Wire Color	Description
1	White/Green	White/Orange	Contact Sensor 1
2	Green	Orange	Common
3	White/Orange	White/Green	Contact Sensor 2
4	Blue	Blue	Common
5	White/Blue	White/Blue	Contact Sensor 3
6	Orange	Green	Common
7	White/Brown	White/Brown	Reserved
8	Brown	Brown	Reserved

Recovering From a Lost Password

Passwords can only be recovered from the serial interface.

To change a lost password:

1. Establish a serial connection to the Switched ePDU (follow the steps in Chapter 7, “Initial Configuration” on page 27).
2. Reboot the Switched ePDU:
 - **Models with a reset hole.** Press and release the reset hole located on the face of the Switched ePDU.

- **Models without a reset hole.** Disconnect and reconnect the power source.

The Switched ePDU displays network and hardware parameters as it boots.

3. Note the MAC address displayed in the hardware parameters section.
4. At the prompt to “Press any key in 5 seconds to change these settings,” quickly press the **m** key.
5. To enter the boot setup, press the **m** key again to modify the settings. The Switched ePDU prompts you for the root password.
6. Enter the backdoor password for the Switched ePDU. This password is unique to each Switched ePDU and is composed of the letters “ipc” plus the last six hexadecimal digits of the MAC address as they are displayed in the hardware parameters section of the boot screen. For example, if the MAC address is 00:04:F3:00:06:35, the backdoor password is “ipc000635.”
7. Follow the instructions starting with Step 5 in “Advanced Boot Configuration” on page 91 to update the root (Admin) password.

This page intentionally left blank.

Chapter 12

Service and Support

If you have any questions or problems with the ePDU, call your **Local Distributor** or the **Help Desk** at one of the following telephone numbers and ask for an ePDU technical representative.

United States: **1-800-843-9433 or 1-919-870-3028**
Canada: **1-800-461-9166 ext 260**
All other countries: **Call your local service representative**

Please have the following information ready when you call the Help Desk:

- Model number
- Serial number
- Version number (if available)
- Date of failure or problem
- Symptoms of failure or problem
- Customer return address and contact information

If repair is required, you will be given a Returned Material Authorization (RMA) Number. This number must appear on the outside of the package and on the Bill Of Lading (if applicable). Use the original packaging or request packaging from the Help Desk or distributor. Units damaged in shipment as a result of improper packaging are not covered under warranty. A replacement or repair unit will be shipped, freight prepaid for all warrantied units.



NOTE *For critical applications, immediate replacement may be available. Call the **Help Desk** for the dealer or distributor nearest you.*

This page intentionally left blank.

Chapter 13

Warranty

Two-Year Limited Warranty (US and Canada)

Eaton Enclosure Power Distribution Units (ePDUs)

WARRANTOR: The warrantor for the limited warranties set forth herein is Eaton Corporation, an Ohio Corporation company ("Company").

LIMITED WARRANTY: This limited warranty (this "Warranty") applies only to the original End-User (the "End-User") of any Eaton-branded Rack-Mounted Power Distribution Units (the "Product") purchased on or after June 1, 2004 and cannot be transferred. This Warranty applies even in the event that the Product is initially sold by Company for resale to an End-User.

LIMITED WARRANTY PERIOD: The period covered by this Warranty for the Product installed [and currently located] in the fifty (50) United States, the District of Columbia, and Canada is twenty-four (24) months from the date of purchase.

WHAT THIS LIMITED WARRANTY COVERS: The warrantor warrants that the Product (the "Warranted Item") is free from defects in material and workmanship. If, in the opinion of Company, a Warranted Item is defective and the defect is within the terms of this Warranty, Company's sole obligation will be to repair or replace such defective Warranted Item (including by providing service, parts and labor, as applicable), at the option of Company.

PROCEDURES FOR REPAIR OR REPLACEMENT OF WARRANTED ITEMS: The Warranted Item will be repaired or replaced at a Company site or such other location as determined by Company.

If the Warranted Item is to be replaced by Company, and the End-User supplies a credit card number or purchase order for the value of the replacement Product, Company will use commercially reasonable business efforts to ship (via standard ground shipment and at no cost to the End-User) the replacement Warranted Item to the End-User within one (1) business day after Company receives notice of the warranty claim. In such case, the End-User must return (at Company's expense) the defective Warranted Item to Company in the same packaging as the replacement Warranted Item received by the End-User or as otherwise instructed by Company. If Company does not receive the defective Warranted Item, Company will either charge the End-User's credit card, or send the End-User an invoice (which the End-User agrees to pay), for the value of the replacement Product.

If the Warranted Item is to be replaced by Company, but the End-User is unwilling or unable to supply a credit card number or purchase order for the value of the replacement Product, Company will use commercially reasonable business efforts to ship (via standard ground shipment and at no cost to the End-User) the replacement Warranted Item to the End-User within one (1) business day after Company receives the defective Product from the End-User.

In any case, Company will provide shipping instructions and will pay its designated carrier for all shipping charges for return of defective equipment and replacement of Warranted Items. Any returned Warranted Item or parts that are replaced may be new or reconditioned. All Warranted Items returned to Company and all parts replaced by Company shall become the property of Company.

WHAT THIS LIMITED WARRANTY DOES NOT COVER: This Warranty does not cover any defects or damages caused by: (a) failure to properly store the Product before installation; (b) shipping and delivery of the Product if shipping is FOB Factory; (c) neglect, accident, abuse, misuse, misapplication, or incorrect installation; (d) repair or alteration not authorized in writing by Company personnel or performed by an authorized Company Customer Service Engineer or Agent; (e) improper testing, operation, maintenance, adjustment, or modification of any kind not authorized in writing by Company personnel or performed by an authorized Company Customer Service Engineer or Agent; or (f) use of the Product under other than normal operating conditions or in a manner inconsistent with the Product's labels or instructions.

This Warranty is not valid if the Product's serial numbers have been removed or are illegible. Any Warranted Items repaired or replaced pursuant to this Warranty will be warranted for the remaining portion of the original Warranty subject to all the terms thereof.

Company shall not be responsible for any charges for testing, checking, removal or installation of Warranted Items.

COMPANY DOES NOT WARRANT EQUIPMENT NOT MANUFACTURED BY COMPANY. IF PERMITTED BY THE APPLICABLE MANUFACTURER, COMPANY SHALL PASS THROUGH SUCH MANUFACTURER'S WARRANTIES TO END-USER.

COMPANY DOES NOT WARRANT SOFTWARE (IF APPLICABLE TO THE PRODUCT), INCLUDING SOFTWARE EMBEDDED IN PRODUCTS, THAT IS NOT CREATED BY COMPANY. WITHOUT LIMITING THE FOREGOING, COMPANY SPECIFICALLY DOES NOT WARRANT SOFTWARE (SUCH AS LINUX) THAT WAS CREATED USING AN "OPEN SOURCE" MODEL OR IS DISTRIBUTED PURSUANT TO AN OPEN SOURCE LICENSE.

THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY OFFERED BY COMPANY WITH RESPECT TO THE PRODUCTS AND SERVICES AND, EXCEPT FOR SUCH FOREGOING WARRANTY COMPANY DISCLAIMS ALL OTHER WARRANTIES INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE. CORRECTION OF NON-CONFORMITIES IN THE MANNER AND FOR THE PERIOD OF TIME PROVIDED ABOVE SHALL CONSTITUTE COMPANY'S SOLE LIABILITY AND END-USER'S EXCLUSIVE REMEDY FOR FAILURE OF COMPANY TO MEET ITS WARRANTY OBLIGATIONS, WHETHER CLAIMS OF THE END-USER ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY), OR OTHERWISE.

LIMITATION OF LIABILITY: The remedies of the End-User set forth herein are exclusive and are the sole remedies for any failure of Company to comply with its obligations hereunder. In no event shall Company be liable in contract, in tort (including negligence or strict liability) or otherwise for damage to property or equipment other than the Products, including loss of profits or revenue, loss of use of Products, loss of data, cost of capital, claims of customers of the End-User or any special, indirect, incidental or consequential damages whatsoever. The total cumulative liability of Company hereunder whether the claims are based in contract (including indemnity), in tort (including negligence or strict liability) or otherwise, shall not exceed the price of the Product on which such liability is based.

Company shall not be responsible for failure to provide service or parts due to causes beyond Company's reasonable control.

END-USER'S OBLIGATIONS: In order to receive the benefits of this Warranty, the End-User must use the Product in a normal way; follow the Product's user's guide; and protect against further damage to the Product if there is a covered defect.

OTHER LIMITATIONS: Company's obligations under this Warranty are expressly conditioned upon receipt by Company of all payments due to it (including interest charges, if any). During such time as Company has not received payment of any amount due to it for the Product, in accordance with the contract terms under which the Product is sold, Company shall have no obligation under this Warranty. Also during such time, the period of this Warranty shall continue to run and the expiration of this Warranty shall not be extended upon payment of any overdue or unpaid amounts.

COSTS NOT RELATED TO WARRANTY: The End-User shall be invoiced for, and shall pay for, all services not expressly provided for by the terms of this Warranty, including without limitation, site calls involving an inspection that determines no corrective maintenance is required. Any costs for replacement equipment, installation, materials, freight charges, travel expenses or labor of Company representatives outside the terms of this Warranty will be borne by the End-User.

OBTAINING WARRANTY SERVICE: In the USA, call the Customer Reliability Center 7x24 at 800-356-5737. Outside of the USA, contact your local Eaton product sales or service representative, or call the Customer Reliability Center in the USA at 919-870-3149. For comments or questions about this Warranty, write to the Customer Quality Representative, 3301 Spring Forest Road, Raleigh, North Carolina 27616 USA.



164202115 1