

Powerware Series

Eaton® ConnectUPS™ Web/SNMP Card
User's Guide
X, BD, and E Models



Powering Business Worldwide

Class B EMC Statements

FCC Part 15

NOTE This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ICES-003

This Class B Interference Causing Equipment meets all requirements of the Canadian Interference Causing Equipment Regulations ICES-003.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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- Harmonized Standards: EN 50091-1-1 and EN 50091-2; IEC 60950 Third Edition
- EU Directives: 73/23/EEC, Council Directive on equipment designed for use within certain voltage limits
93/68/EEC, Amending Directive 73/23/EEC
89/336/EEC, Council Directive relating to electromagnetic compatibility
92/31/EEC, Amending Directive 89/336/EEC relating to EMC

The EC Declaration of Conformity is available upon request for products with a CE mark. For copies of the EC Declaration of Conformity, contact:

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Chapter 1 Introduction

The Eaton® ConnectUPS™ Web/SNMP Card is a network device for your uninterruptible power system (UPS) that provides both SNMP and HTTP compatibility.

The ConnectUPS Web/SNMP Card is available in three models:

- **ConnectUPS-X** – a card for UPSs with an X-Slot™
- **ConnectUPS-BD** – a card for UPSs with a BestDock™ slot
- **ConnectUPS-E** – an external adapter for Eaton 9305 and 9150 UPSs

Features

All models can connect to a twisted-pair Ethernet network (10/100BaseT) using an RJ-45 connector.

The ConnectUPS-X has a built-in switching hub that allows three additional network devices to be connected to the network without the requirement of additional network drops.

With the ConnectUPS Web/SNMP Card, you can monitor the UPS several different ways:

- using a Web browser such as Microsoft® Internet Explorer to monitor and manage the connected UPS
- using your Internet-ready cell phone or PDA (personal digital assistant)
- using SNMP-compatible network management software (user-supplied) to monitor the UPS in a method similar to that of other network devices

The ConnectUPS Web/SNMP Card also supports remote monitoring and shutdown of UPS-protected computer systems. NetWatch client software for use with a ConnectUPS Card is supplied on the Software Suite CD or on the Web at:

<http://powerquality.eaton.com/Support/Software-Drivers/default.asp>

Client software is available for Microsoft Windows®, Mac OS® X, Novell® NetWare®, Linux®, and UNIX®. These programs communicate through TCP/IP with the ConnectUPS Card and automatically shut down the protected system during extended power outages.

In addition, the ConnectUPS Card has the following features:

- Hot-swappable, simplifying installation by allowing you to install the card safely without powering down the critical UPS load.
- Configuration from serial port, Telnet, SSH, HTTP Web browser, Bootp, or DHCP.
- Management from HTTP Web browser, Internet-ready cell phone or PDA, or SNMP management software.
- E-mail notification of changes in the UPS status through SMTP (simple mail transport protocol) via e-mail client software, a PCS (personal communication services) phone, or alphanumeric pager.
- Support for Eaton (XUPS.MIB) and RFC-1628 Standard UPS (STDUPSV1.MIB) management information bases.
- Firmware upgradable through a Microsoft Windows utility using a network connection.
- Scheduling function to control UPS shutdowns and startups.
- History log files (data and events) for recording power problems.
- UPS status information available to registered NetWatch clients for automatic shutdown of Microsoft Windows, Mac OS X, Novell NetWare, Linux, and UNIX.
- With a special Status@aGlance page, a color-coded background on your Web browser providing quick visibility of the UPS status.
- Monitoring of multiple ConnectUPS Web/SNMP Cards by using free MultiView software.
- Monitoring of two normally-open or normally-closed contact devices through a connection to the configuration port (see page 35).
- Compatible with the Environmental Monitoring Probe (EMP).

System Application

The following diagram shows how the ConnectUPS Web/SNMP Card can be used in a network application.

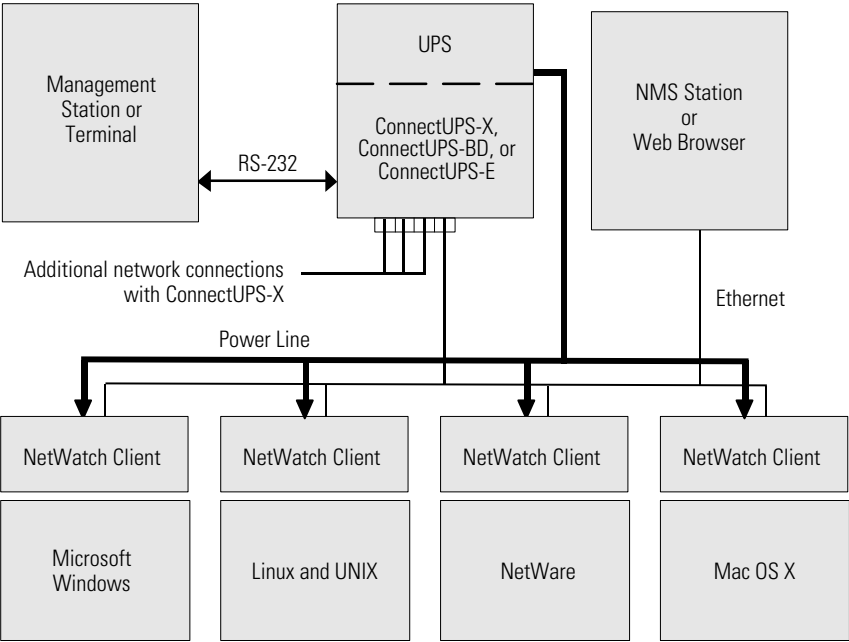


Figure 1. ConnectUPS Web/SNMP Card System Application Diagram

Chapter 2 Remote Configuration

Use the following procedures to access the ConnectUPS Web/SNMP Card's configuration menus through a Web browser or Telnet utility.



NOTE *Not all settings are configurable through both interfaces. For example, the following security-related and hardware parameters cannot be configured through a Web browser: Network Connection Test (Ping utility), Enable/disable TFTP, Telnet, HTTP control and security settings, and HTTP port number setting.*

If you prefer to configure the card locally instead, refer to the Quick Start Instructions.

Set Up the IP Address

To set up the IP address:

1. Verify that an active 10/100BaseT cable is connected to the card's network connector (the Uplink Port 1 Ethernet connector on the ConnectUPS-X).
2. If the IP address of the computer is on the same network with the card, you can run the Web browser directly; continue to the following section, "Configure the Card." Otherwise, continue to the following step.



NOTE *The default IP address of the card is 192.168.7.18.*

3. If the IP address of the computer is not on the same network with the card, set up the computer's TCP/IP protocol parameters temporarily to the 192.168.7.x subnet.



NOTE *Refer to the operating system documentation for additional details on changing the computer's IP address.*

NOTE *The computer and the card must be on the same subnet for configuration. You can change the card's IP address to match your local subnet during configuration.*

Configure the Card

You can configure the card through a Web browser or Telnet:

- To set parameters through a Web browser, continue to the following section, "Configure through a Web Browser."
- To establish a Telnet connection and set parameters, go to "Configure through a Telnet Connection" on page 15.

Configure through a Web Browser

To configure the card through a Web browser:

1. Run the Web browser and connect to the card IP address (the default is 192.168.7.18). The home page of the card displays (see Figure 2).

Eaton | Powerware **ConnectUPS™ Web/SNMP Card**

[Summary](#) [UPS History](#) [Configuration](#) [Control](#) [Registered Clients](#) [Language](#) [Help](#)

[Summary](#) [Help](#)

Summary

Identification

UPS Model	PW9125 1250
UPS Firmware version	FP: 7.14 INV: 7.14
VA Rating	1250 VA
User-Assigned Name	UPS Web Card
Card's IP Address	10.222.42.116

Current Status

Overall Status	Status@aGlance SYSTEM NORMAL
Runtime (minutes)	88
Last Battery Test Status	Unavailable
Last Logged Events	09/01/2005 08:19:18 UPS Load Segment 1 Turn On command sent 09/01/2005 08:19:18 UPS Load Segment 2 Turn On command sent 09/01/2005 08:19:19 Turn UPS On command sent

Input

Voltage In (VAC)	116
Current In (AC Amps)	2.2
Frequency (Hertz)	60.3

Output

Voltage Out (VAC)	120
Current Out (AC Amps)	0.8
Frequency (Hertz)	60.3
True Power (Watts)	48
Apparent Power (VA)	93
UPS Load (%)	7

Battery

Battery Status	Normal
Voltage (VDC)	52.5

Statistics

UPS Internal Temperature (Degrees C)	27
Number of Registered NetWatch Clients	0
ConnectUPS Up-Time	27 days 4 hours 36 mins 17.43 secs.
Date (mm/dd/yyyy)	09/01/2005
Time (hh:mm:ss)	13:15:00

Links

[Powerware](#)
[Download ConnectUPS MultiView](#)

[Become Superuser](#)

Figure 2. Sample ConnectUPS Web/SNMP Card Home Page

- 2. Select **Configuration** from the menu at the top of the home page, then **Web/SNMP Card Configuration** to set the card parameters (see Figure 3).

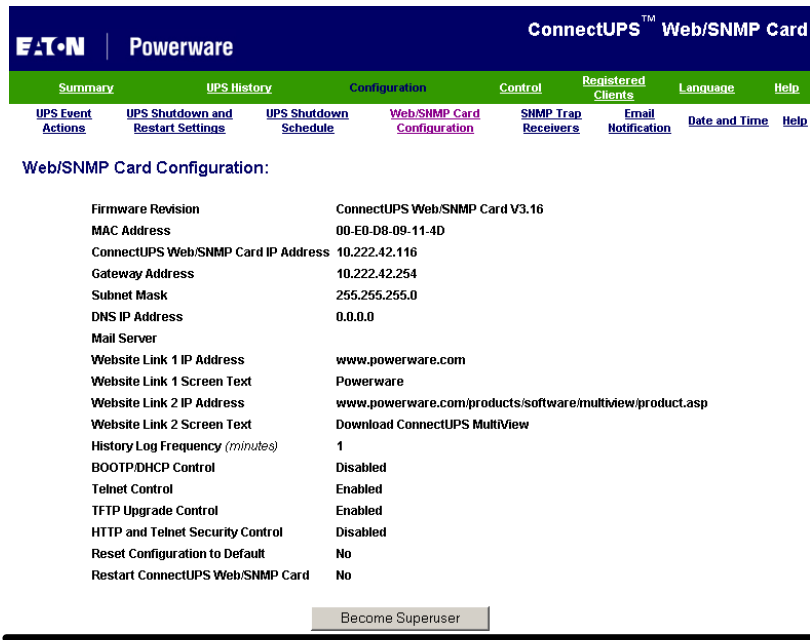


Figure 3. Sample ConnectUPS Web/SNMP Card Configuration Page

- 3. Select **Become Superuser** and log in with the *Username* and *Password*. The default username and password is admin (see Figure 4).

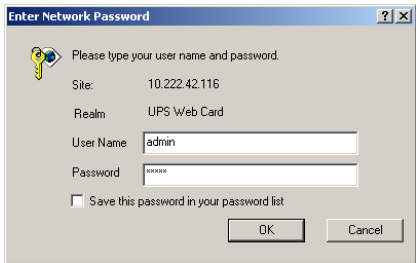


Figure 4. Log In Screen

4. Select and edit the **ConnectUPS Web/SNMP Card IP Address** (see Figure 5).
5. Select and edit the **Gateway Address** for the network.
6. Select and edit the **Subnet Mask** of the network.
7. Select **Set Values** to save the new settings.
8. If you changed the IP address in Step 4, restart the browser using the new IP address to restore communication with the card.



NOTE If you changed the computer's IP address to allow access to the card's default IP address, reconfigure the computer as necessary.

9. Select **Configuration** from the menu at the top of the home page to continue configuring the card.

Eaton Powerware		ConnectUPS™ Web/SNMP Card	
Summary	UPS History	Configuration	Control
UPS Event Actions	UPS Shutdown and Restart Settings	UPS Shutdown Schedule	Web/SNMP Card Configuration
		SNMP Trap Receivers	Registered Clients
		Email Notification	Language
		Date and Time	Help

Web/SNMP Card Configuration:

Firmware Revision	ConnectUPS Web/SNMP Card V3.16
MAC Address	00-E0-D8-09-11-4D
ConnectUPS Web/SNMP Card IP Address	10.222.42.116
Gateway Address	10.222.42.254
Subnet Mask	255.255.255.0
DNS IP Address	0.0.0.0
Mail Server	
Website Link 1 IP Address	www.powerware.com
Website Link 1 Screen Text	Powerware
Website Link 2 IP Address	www.powerware.com/products/sc
Website Link 2 Screen Text	Download ConnectUPS MultiView
History Log Frequency (minutes)	1
BOOTP/DHCP Control	Disabled
Telnet Control	Enabled
TFTP Upgrade Control	Enabled
HTTP and Telnet Security Control	Disabled
Reset Configuration to Default	No
Restart ConnectUPS Web/SNMP Card	No

Figure 5. Web/SNMP Card Configuration Screen

- 10. Select **Date and Time** from the menu at the top of the page (see Figure 6).
- 11. Enter the appropriate date and time information in the specified format.

Synchronize with computer time is the default. You can also synchronize with an NTP server or set the date and time manually.

- 12. Select **Set Values** to save the date and time settings.

The card is now configured for operation on your network. See “Configuration Menu Settings” on page 39 or the online help for detailed information about each menu selection.

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ConnectUPS™ Web/SNMP Card

Summary

UPS History

Configuration

Control

Registered Clients

Language

Help

UPS Event Actions

UPS Shutdown and Restart Settings

UPS Shutdown Schedule

Web/SNMP Card Configuration

SNMP Trap Receivers

Email Notification

Date and Time

Help

Date and Time:

Date (mm/dd/yyyy)

09/01/2005

Time (hh:mm:ss)

13:20:09

☒ Synchronize with computer time

Computer Date (mm/dd/yyyy)

09/01/2005

Computer Time (hh:mm:ss)

13:19:48

☐ Synchronize with NTP server

NTP server address

128.105.201.11

DNS Address

0.0.0.0

Time Zone

[GMT-05:00] Eastern Time (US & Canada)

☐ Enable Daylight Saving Time

☐ Set manually

Date (mm/dd/yyyy)

09/01/2005

Time (hh:mm:ss)

13:20:06

Set Values

Figure 6. Date and Time Screen

Configure through a Telnet Connection

To configure the card parameters through a Telnet connection:

1. Run your Telnet utility to connect to the card. The card's default IP address is 192.168.7.18.
2. Open the connection. A login prompt displays.
3. Enter your *username* and *password*. The menu of the ConnectUPS device displays. The default username and password is admin.
4. Configure the card parameters as described in "Configuration Menu Settings" on page 39.

Install Shutdown Software

Refer to the Quick Start Instructions to install the NetWatch shutdown software. For other software, such as LanSafe® Power Management Software or PowerVision Software, refer to those user guides for installation and configuration instructions.

Chapter 3 UPS Power Management

You can manage the UPS from a Web browser or from an SNMP network management system.

UPS Management from a Web Browser

When using a Web browser to access the ConnectUPS Web/SNMP Card, the majority of UPS-related information is available by selecting any of the following menu options:

- Summary
- UPS History
- Configuration
- Control
- Registered Clients
- Language
- Help

Each menu and submenu selection has online help available.

Viewing Status@aGlance

Status@aGlance is a page that provides a simple, intuitive way to view UPS status information and is accessed through a Status@aGlance link on the Summary page. It changes the background color of the page to reflect the UPS status:

- Green indicates normal UPS operation.
- Yellow indicates the UPS is responding to a problem (the UPS is on battery during a power outage; the UPS has one or more alarms present; or the UPS has been bypassed).
- Red indicates a low battery condition and shutdown is imminent.
- Black indicates a loss of communication between the UPS and the ConnectUPS Web/SNMP Card.

If you leave the browser pointed to this page, it automatically updates when new UPS information is available. To return to the Summary page, point and click the mouse pointer anywhere within the colored background area.

MultiView Software

The Status@aGlance pages of several ConnectUPS Web/SNMP Cards may be monitored simultaneously by installing the MultiView software on a PC with Microsoft Windows.

The software is included on the CD-ROM supplied with the ConnectUPS Web/SNMP Card or it can be downloaded from the link on the ConnectUPS Web/SNMP Card Summary page.

The MultiView software works in tandem with Internet Explorer to discover and display multiple browser windows, each representing a different ConnectUPS Web/SNMP Card. You also have the flexibility to pick other Web pages as presented by the ConnectUPS Web/SNMP Card during configuration. MultiView software can also monitor the Status@aGlance feature within the LanSafe Power Management Software.

Becoming the Superuser

Several menus allow UPS and ConnectUPS Web/SNMP Card parameters to be modified by the user. However, many of these are password-protected for the Superuser. To become the Superuser, you must log in with a username and provide a password. Both are configurable by serial or Telnet connection. The default username and password is admin.



NOTE *Once you have become the Superuser, it is important to completely exit the browser to set the security level back to the standard read-only level.*

Turning the UPS On and Off

The ConnectUPS Web/SNMP Card supports the ability to remotely turn off the UPS and its supported load. You can also reboot the UPS (cycling output power off and then back on), as well as schedule shutdowns and startups on a predetermined basis.

Selecting **Control** from the menu at the top of the home page provides a page that allows the Superuser to turn off the UPS. In addition, you may initiate a battery test and enable or disable any scheduled shutdowns or startups as specified in the UPS shutdown schedule table (accessed from the Configuration menu).



CAUTION

- Selecting **Turn UPS Off** turns off the output of the UPS. Any equipment powered by the UPS shuts down immediately. Prepare the protected equipment for the shutdown.
 - If you select **Turn UPS Off** with **Load Segment to Restart following the Return of AC Power** set to **NO**, you will have to manually restart the UPS after the shutdown occurs.
-

Forcing the UPS to Shut Down

1. Select **Configuration** from the menu at the top of the home page, then **UPS Event Actions**.
2. Log in as the Superuser.
3. Select **UPS Shutdown and Restart Settings**.
4. Verify **Load Segment to Turn Off following OS Shutdown** is set to **YES**.
5. Set the appropriate **Delay Before Segment Turns Off following the start of the Client's OS Shutdown** in seconds to ensure that any NetWatch clients and their respective operating systems have enough time to complete their shutdown. The default is 180 seconds, but you may wish to increase or decrease this value as appropriate for your system.
6. To turn off the UPS and have it stay off (requiring local interaction to turn it back on), change **Load Segment to Restart following the Return of AC Power** to **NO**.

If you want to effectively reboot the UPS and the associated load, then set **Load Segment to Restart following the Return of AC Power** to **YES** and set **Delay Before Segment Restart** to a valid delay value to allow the UPS to restart after the specified delay.

7. After choosing the desired values, select **Set Values** to update the card with the new information.
8. Select **Control** from the ConnectUPS Web/SNMP Card menu at the top of the home page and select **Load Segment "ALL"** or the appropriate load segment **"NUMBER(S)"**. Then select **Turn UPS Off**.
9. To initiate the shutdown sequence select **Set Values**. The card sends the appropriate information to the UPS and any clients running the NetWatch client software.

Planning a Scheduled UPS Shutdown and Restart



NOTE Before scheduling any shutdowns or startups, you must configure the date and time within the ConnectUPS Web/SNMP Card.

You may use the ConnectUPS Web/SNMP Card to schedule the day of the week and time of a shutdown and a startup. The ability to schedule shutdowns and startups is UPS dependent (consult your UPS documentation for more information).

1. Select **Configuration** from the menu at the top of the home page, then **UPS Shutdown Schedule**.
2. Log in as the Superuser.
3. You may configure up to seven event pairs. Enter the upcoming **Shutdown Day** and **Shutdown Time** and, if needed, the **Restart Day** and **Restart Time**. Times are in 24-hour format based on the date and time set within the ConnectUPS Web/SNMP Card.
4. Select **Set Values** to update the card.
5. Once the values are set, select **Control** from the menu at the top of the home page.
6. Select **Enable UPS Shutdown Schedule**, then select **Set Values** to start the process. Any shutdown/restart events repeat until you change the table or select **Disable UPS Shutdown Schedule**.

Configuring E-Mail Notification

You may use the ConnectUPS Web/SNMP Card to inform selected e-mail accounts of events and changes in status as they occur in the UPS or to provide a daily status message at a predetermined time.

- 1. Select **Configuration** from the menu at the top of the home page, then **Email Notification**.
- 2. Become the Superuser and then enter the IP address or Hostname of the SMTP **Mail Server** that will be used to send the e-mail messages (see Figure 7).

If you entered a host name for the mail server, you must enter the IP address of your network DNS Server in the **DNS Address** block.

- 3. To receive a daily status report, enter the time of day to send the e-mail (in 24-hour format).
- 4. Enter the **Mail Account**, **Description**, **Mail Type**, **Event Level**, and **Event Type** for each recipient. The Mail Account must be a valid e-mail address. Refer to the online help file for more details about these fields.
- 5. Select **Set Values** to save your changes.

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ConnectUPS™ Web/SNMP Card

Summary

UPS History

Configuration

Control

Registered Clients

Language

Help

UPS Event Actions

UPS Shutdown and Restart Settings

UPS Shutdown Schedule

Web/SNMP Card Configuration

SNMP Trap Receivers

Email Notification

Date and Time

Help

Email Notification:

Mail Server

DNS Address

0.0.0.0

Mail Daily Status Report At (hh:mm)

00:00

Advanced Settings

View & Configure

Index	Mail Account	Description	Mail Type	Event Level	Event Type
1			None	Minor	RFC 1628 MIB Traps
2			None	Minor	RFC 1628 MIB Traps
3			None	Minor	RFC 1628 MIB Traps
4			None	Minor	RFC 1628 MIB Traps

Set Values

Send Test

Figure 7. Email Notification Configuration Screen

6. For **Advanced Settings**, select **View & Configure**.

Enter the **Sender's Email Address**, **Optional SMTP Username**, **Optional SMTP Password**, **SMTP Reply to Address**, and **SMTP Port Number** (see Figure 8). Refer to the online help file for more details about these fields.

Select **Set Values** to save your changes.

The screenshot shows the 'Email Advanced Settings' screen within the ConnectUPS Web/SNMP Card interface. The top navigation bar includes 'Eaton Powerware' and 'ConnectUPS Web/SNMP Card'. Below this is a menu with tabs: 'Summary', 'UPS History', 'Configuration', 'Control', 'Registered Clients', 'Language', and 'Help'. Under the 'Configuration' tab, there are sub-tabs: 'UPS Event Actions', 'UPS Shutdown and Restart Settings', 'UPS Shutdown Schedule', 'Web/SNMP Card Configuration', 'SNMP Trap Receivers', 'Email Notification', 'Date and Time', and 'Help'. The 'Email Notification' sub-tab is selected, showing the 'Email Advanced Settings' section. This section contains five input fields: 'Sender's Email Address' (with value 'UPS.Web.Card@10.222.42.116'), 'Optional SMTP Username' (empty), 'Optional SMTP Password' (empty), 'SMTP Reply to Address' (with value 'UPS.Web.Card@10.222.42.116'), and 'SMTP Port Number' (with value '25'). At the bottom of the form are two buttons: 'Back to Email Notification' and 'Set Values'.

Figure 8. Email Notification Advanced Settings Screen

7. Test your settings by pressing the **Send Test** button.



NOTE When changing any e-mail configuration items, it is strongly recommended to use the **Send Test** function to test your changes. Any e-mail errors are logged in the ConnectUPS Web/SNMP Card Event Log. Review the Event Log within a few minutes of testing the e-mail to see if any errors are logged.

Performing a Manual UPS Battery Test

You can use the ConnectUPS Web/SNMP Card to manually perform a UPS battery test. The ability to test the UPS is model dependent (consult your UPS documentation for more information).

1. To manually start a battery test on a specific UPS, select **Control** from the menu at the top of the home page.
2. Become the Superuser.
3. Select **Initiate Battery Test**, followed by **Set Values** to start the process.

Viewing the UPS History Logs

Select **UPS History** from the menu at the top of the home page to choose the current **UPS Data Log** and **UPS Event Log**:

- The data log provides numerical data logged once a minute from the UPS.
- The event log contains text messages regarding the status of the UPS and the ConnectUPS Web/SNMP Card.

Past data and event logs are also accessible, as well as a data log applet that displays the data in a graphical format.

UPS Management from an SNMP NMS

To access the ConnectUPS Web/SNMP Card via SNMP:

1. Use these Community strings:

GET Community string: *public*

SET Community string: *private*

By default, the ConnectUPS Web/SNMP Card's Write Access Managers table is configured for read-only SNMP access to any NMS with a *public* community string. An NMS with a *private* community string has read/write SNMP access.



NOTE *For security, it is recommended to change the Write Access Managers table using specific IP addresses and nonstandard community strings.*

2. The *xups.mib* and *stdupsv1.mib* files (on the supplied CD-ROM or at <http://powerquality.eaton.com/Support/Software-Drivers/default.asp>) contain the MIB for the ConnectUPS Web/SNMP Card. Add these files to the MIB database of your SNMP management software (such as HP OpenView,[™] IBM[®] Director, and Sun NetManager).
3. Using the facilities provided by the SNMP management software, you can access the individual MIB objects. Refer to the MIB files on the supplied CD-ROM for more information.

Viewing UPS Monitoring Parameters

The ConnectUPS Web/SNMP Card supports several MIB groups that separate specific UPS parameters into related areas. The groups used in the MIB for the card include:

- Ident
- Battery
- Input
- Output
- Config
- Control
- Test
- Alarms
- Bypass
- Traps

Forcing the UPS to Shut Down

The ConnectUPS Web/SNMP Card supports MIB groups containing objects that enable the user to shut down and restart the UPS.

Receiving Event Traps

The ConnectUPS Web/SNMP Card supports several event-related traps that can be reported to the SNMP network management software.

Refer to the MIB files found on the supplied CD-ROM for more information.

Automatic Shutdown of UPS-Protected Computers

NetWatch client software supports remote UPS monitoring and automatic shutdown of UPS-protected computer systems and is available on the supplied CD-ROM or from <http://powerquality.eaton.com/Support/Software-Drivers/default.asp>.

Clients are available for the following operating systems:

- Microsoft Windows
- Novell NetWare
- Linux
- UNIX
- Mac OS X

Each NetWatch client uses its IP address to register with a specified ConnectUPS Web/SNMP Card via the network. Once a client has registered, any change in UPS status is communicated to NetWatch. Depending on the operating system, NetWatch typically alerts the user(s) whenever the UPS begins supplying AC power from its batteries (for example, the AC line fails). Then, if AC line power does not return and the remaining battery time is low, NetWatch takes over and completes an operating system shutdown prior to the UPS running out of battery power.

Settings found in the UPS Event Actions and UPS Shutdown page and the Restart Settings page are related to the automatic shutdown of the UPS-protected computer system using NetWatch. By default, the ConnectUPS Web/SNMP Card initiates an automatic operating system shutdown only during a low battery condition. The ConnectUPS Web/SNMP Card (firmware v2.03 and higher) no longer instructs the UPS to power off after the operating system shutdown.

Appendix

The appendix contains:

- The card panel details (connections and LEDs)
- Technical card specifications
- DIP switch and jumper settings
- Serial Pass-Through mode
- Upgrading the firmware
- External contact monitoring feature
- Configuration menu settings
- Secure Sockets Layer (SSL) certificate installation
- Secure Shell (SSH) Installation
- Service and support
- Warranty

ConnectUPS Web/SNMP Card Panel Details

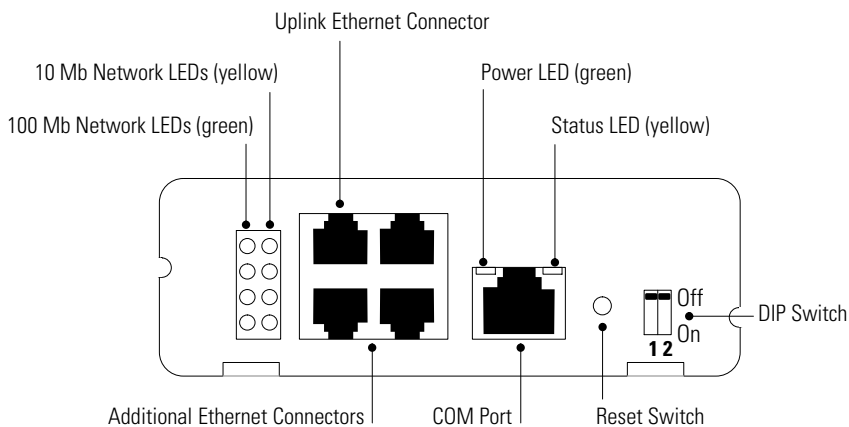


Figure 9. ConnectUPS-X Panel Details



NOTE Three additional 10/100 Mb Ethernet connectors are available on the ConnectUPS-X and are served by an internal switching hub. If you frequently move devices between these connectors or make configuration changes, it may be necessary to clear the cache by pressing the RESET switch on the card with a pen or paperclip.

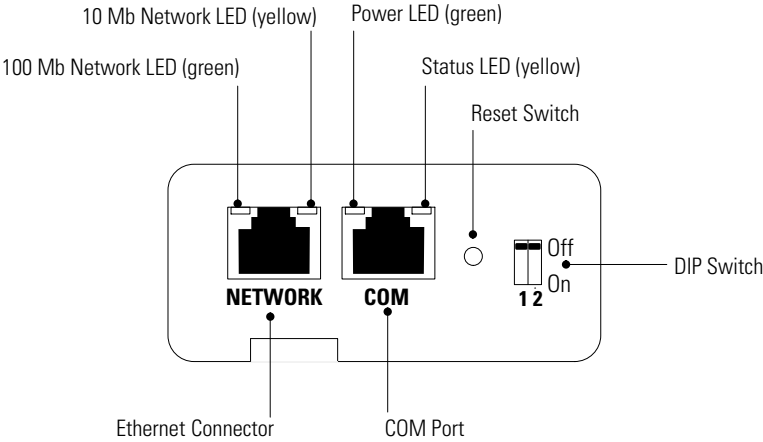


Figure 10. ConnectUPS-BD Panel Details

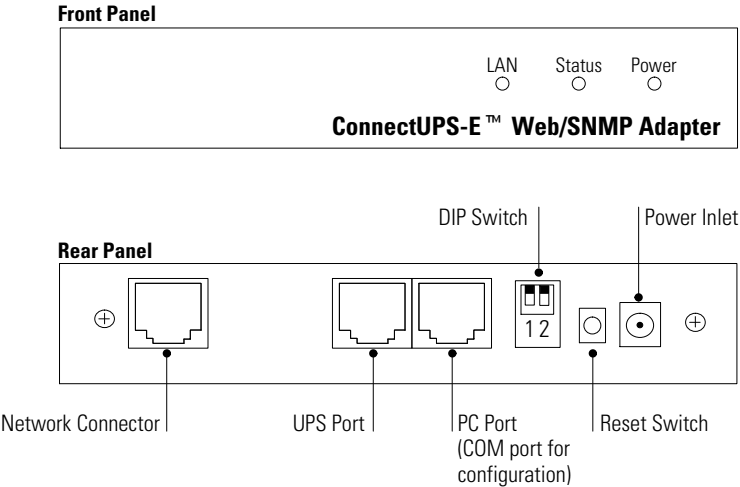


Figure 11. ConnectUPS-E Panel Details

LED Description

The functions of the ConnectUPS Web/SNMP Card are indicated by the Status LED and either the 10 Mb or 100 Mb LEDs, as listed in the following tables.

Table 1. ConnectUPS-X and ConnectUPS-BD LEDs

Status LED	10 Mb or 100 Mb LED	Card Function Description
Flickering	On/Flickering	Normal operation with Ethernet traffic
On	On	ConnectUPS Web/SNMP Card error
Off	Off	UPS power low (no power to the ConnectUPS Web/SNMP Card)
Flashing	Flashing	No connection to UPS (alternate flashing as the ConnectUPS Web/SNMP Card restarts)

Table 2. ConnectUPS-E LEDs

Status LED	Network LED	ConnectUPS-E Function Description
Off	On	Normal operation
Off	Flashing	Ethernet traffic
Flashing	Off	IP address is default value
On	On	ConnectUPS-E error
Off	Off	UPS power low
Flashing	Flashing	No connection to UPS
On	Flashing	Setup mode

Technical Specifications

Table 3. Technical Specifications

CPU	AC1101
Memory	1024k × 8 Static DRAM 1024k × 8 Flash ROM
LAN Controller	AC1102
Network Connection	10/100BaseT RJ-45 network connector (ConnectUPS-X provides 3 additional connectors for your devices)
UPS Protocol	Eaton UPS communication protocol
Network Protocol	HTTP over TCP/IP SNMP over UDP/IP SMTP, ARP, RARP, and TFTP BOOTP, DHCP
Supported MIB	Eaton PowerMIB (XUPS.MIB) RFC-1628 Standard UPS (STDUPSV1.MIB)
OS Supported for Shutdown	Microsoft Windows Novell NetWare Linux UNIX Mac OS X
Operating Temperature	0–40°C (32–104°F)
Operating Humidity	10–80%, noncondensing
Power Input	9 Vdc unregulated ConnectUPS-E requires 12 Vdc
Power Consumption	3.5 watts maximum
Size (L x W x H)	ConnectUPS-X: 12 cm x 11.4 cm x 3.9 cm (4.7" x 4.5" x 1.5") ConnectUPS-BD: 13.4 cm x 8.1 cm x 3.3 cm (5.3" x 3.2" x 1.3") ConnectUPS-E: 13.4 cm x 9 cm x 3 cm (5.3" x 3.5" x 1.2")
Weight	200 gm (7 oz)
EMC Statements	Class B: FCC Part 15, ICES-003, CE

DIP Switch Description

DIP switch definitions for the ConnectUPS Web/SNMP Cards are listed in Table 4.

Table 4. DIP Switch Modes

SW1	SW2	Description
Off	Off	Operational Mode (default)
Off	On	BOOTP/DHCP Enable Mode (overrides the serial/Telnet configuration)
On	Off	Reserved
On	On	Reserved

Jumper 1 Settings

Jumper 1 (JP1) is found on all three models (ConnectUPS-X, ConnectUPS-BD, and ConnectUPS-E). The JP1 pins are NOT jumpered by factory default. Table 5 shows the jumper definitions.

Table 5. JP1 Definitions

Jumper Setting	Definition
1 and 2	Allows admin to be entered as the password when the programmed Superuser password has been forgotten
3 and 4	Disables all changes to the card's configuration

NOTE On the ConnectUPS-BD, jumper positions 5 and 6, 7 and 8 are undefined; DO NOT jumper these positions.

Serial Pass-Through Mode



NOTE Serial pass-through functionality is available only with the ConnectUPS Card firmware v3.20 and higher (with older, non-RoHS hardware) and v4.20 and higher (with RoHS hardware). Updates to the ConnectUPS Card firmware are available at <http://powerquality.eaton.com/Support/Software-Drivers/default.asp>.

During normal operation, the ConnectUPS Card controls the communication path to the UPS and allows network-based access to UPS data through the Web and SNMP. Some situations require direct serial communication to the UPS in a pass-through mode, such as:

- The UPS firmware requires a field upgrade with a 9600 baud serial port connection to the UPS.
- The user wants to run a local copy of LanSafe software with serial communication to the UPS.

The card's Normal mode of operation must be disabled for Serial Pass-Through mode to be available.

Reconfiguring the Card for Serial Pass-Through Mode



NOTE In Serial Pass-Through mode, communication through the ConnectUPS Card Ethernet port stops, and any existing connections (such as to NetWatch software clients or SNMP management tools) cease. However, the Ethernet switch functionality of the ConnectUPS Card continues to function.

The following steps disable Normal mode by changing the switches on the ConnectUPS Card and restarting the card in Serial Pass-Through mode.

To reconfigure the card for Serial Pass-Through mode:

1. Note the current position of DIP switches on the card [the default setting for both switches is the **0** (off) position]. Write them here for later reference.

 DIP Switch 1 ____ **0** (off) ____ **1** (on)

 DIP Switch 2 ____ **0** (off) ____ **1** (on)
2. Set both DIP switches to the **1** (on) position for Serial Pass-Through mode.

3. Using a pen or paperclip, press the RESET switch on the card to restart the card in the Serial Pass-Through mode.
4. Locate the configuration cable (labeled "PC") that was supplied with the ConnectUPS Card.
5. Plug the RJ-45 end of the configuration cable into the COM port on the card.

Verify that you have used the port labeled "COM." The other ports on the card will not work for configuration.

6. Plug the other end of the configuration cable into the serial COM port on the computer.
7. Set up the PC to communicate with the UPS serially:
 - Open your terminal emulation program (such as HyperTerminal®).
 - Select the appropriate serial connection (such as COM1).
 - Set the serial line to 9600 baud, No parity, 8 data bits, 1 stop bit, and no flow control.

Returning the Card to Normal Operation

After using the card in Serial Pass-Through mode, restart the card in Normal mode:

1. Disconnect the configuration cable from the card and PC.
2. Return the card's switches to the original settings noted in Step 1 on page 32.
3. Using a pen or paperclip, press the RESET switch on the ConnectUPS Card to restart the card in Normal mode.

Upgrading the Card Firmware

During the upgrade process, the ConnectUPS Web/SNMP Card is inaccessible, but restarts automatically within a minute after completing the upgrade.

To upgrade the firmware:

1. Locate a networked PC with Microsoft Windows.
2. Download the Firmware Upgrade Utility (*Upgrade100.exe*) program and the applicable firmware, available on the Web at:

<http://powerquality.eaton.com/Support/Software-Drivers/default.asp>



NOTE Review the firmware history file (*History100.pdf*) for a list of current enhancements.

3. Run the Firmware Upgrade Utility by selecting **Start**, **Run**, and then entering the path and filename *Upgrade100.exe*.
4. Select **Discover**. The utility attempts to find all reachable 10/100 ConnectUPS Web/SNMP Cards on the network. The table displays all cards that are found.

Discover searches only the current subnet. To upgrade a card that is reachable but not on the subnet, click the **Add** button and provide the requested information.
5. Activate the checkbox by the ConnectUPS Web/SNMP Card(s) to be upgraded (up to four cards at a time under most network conditions).
6. Highlight the ConnectUPS Web/SNMP Card IP address to select the individual card. Click **Modify** and enter the Superuser name and password. Repeat this step for each card that will be upgraded.

7. Select **Open** next to **Filename** and select the binary upgrade file that was previously downloaded or otherwise received and copied to the PC.

Select **Upgrade** to start the process. After the process starts, do not cancel or interrupt the upgrade process. Otherwise, the ConnectUPS Web/SNMP Card receives a corrupted image, preventing the card from operating correctly.

8. When the Firmware Upgrade Utility completes, exit the program by selecting **Quit** and then answering **Yes** to confirm.

External Contact Monitoring Feature

The status of the two user-provided contact devices is monitored via pins on the ConnectUPS Card COM (configuration) port and reported several different ways:

- **SNMP** – via the PowerMIB, the card sends traps indicating the active or inactive state of the contact.
- **E-mail notification** – if this feature has been configured on the ConnectUPS Card, the specified recipients receive an e-mail whenever the contact status changes. The body of the e-mail contains the Contact Number, Contact Type, Contact State, and Contact Description.

If these recipients have been configured to receive notification of “All” event levels via e-mail, they also receive notification whenever the contact monitoring is enabled or disabled and when the contact monitoring cable is installed or removed.

- **ConnectUPS Card Web pages** – the Summary and Status@aGlance pages reflect the change in state of the contact. The Event Log is updated with all External Contact Monitoring-related messages, including the Contact Number to assist with identification of the contact.

Cabling

To use the Contact Monitoring features, construct a cable with an RJ-45 connector that will plug into the ConnectUPS Web/SNMP Card COM (configuration) port.

You can use a CAT5 Ethernet cable and remove the other RJ-45 connector. Only four of the eight wires present in the cable are required to connect the two contact devices. See Figure 12 and Table 6 to construct the cable.

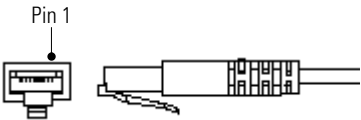


Figure 12. RJ-45 Connector

Table 6. RJ-45 Pin Functions

Function	RJ-45 Pin Number and Signal Name	
Signal Source	2 (DTR)	
Cable Sense Input	5 (DCD)	Connect to Pin 2 so that the ConnectUPS Card can sense the installed cable.
Contact Input 1	7 (DSR)	Connect to Pin 2 so that the ConnectUPS Card can sense the first user-supplied contact device.
Contact Input 2	8 (CTS)	Connect to Pin 2 so that the ConnectUPS Card can sense the second user-supplied contact device.

SNMP Specifics for All Supported Contacts

The ConnectUPS generates PowerMIB trap number 30 (*xupstdContactActiveNotice*) to indicate the change from normal state of either contact.

The trap text is "The Contact indicated by *xupsContactIndex* is in its Active State." The severity level of this trap is MAJOR.

Table 7. xupstdContactActiveNotice Trap Variables

Variable	Description	Comments
xupsContactIndex	The number of the supported contact	
xupsContactType	normallyOpen(1) or normallyClosed(2)	Since the monitoring of the contact is assumed to be enabled if you receive the trap, the Type notUsed(4) would never be sent. Since Type anyChange(3) is not supported by the ConnectUPS, it is also not a valid type.
xupsContactState	The current "notice" state of the contact	Valid states for the trap would be openWithNotice(3) or closedWithNotice(4). Open(1) and closed(2) are assumed to be the "normal" (at rest) states of the contacts being monitored and would not be valid during the sending of this trap.
xupsContactDescr	The user-friendly External Contact Name for the appropriate contact	The default for each contact being monitored is "External Contact #_ Status" where the '_' is the number (index) of the contact.

The ConnectUPS generates PowerMIB trap number 31 (*xupstdContactInactiveNotice*) to indicate the return to the normal state of either contact.

The trap text is "The Contact indicated by *xupsContactIndex* has changed to its Inactive state." The severity level of this trap is INFORMATIONAL.

Table 8. xupstdContactInactiveNotice Trap Variables

Variable	Description	Comments
xupsContactIndex	The number of the supported contact	
xupsContactType	normallyOpen(1) or normallyClosed(2)	Since the monitoring of the contact is assumed to be enabled if you receive the trap, the Type notUsed(4) would never be sent. Since Type anyChange(3) is not supported by the ConnectUPS, it is also not a valid type.

Variable	Description	Comments
xupsContactState	The current “normal” state of the contact	Valid states for the trap would be open(1) and closed(2) since these are the normal (at rest) states of the contacts being monitored. OpenWithNotice(3) or closedWithNotice(4) are the “notice” states for the contacts being monitored and would not be valid during the sending of this trap.
xupsContactDescr	The user-friendly External Contact Name for the appropriate contact	The default for each contact being monitored is “External Contact #_ Status” where the ‘_’ is the number (index) of the contact.

E-mail Notification Specifics for All Supported Contacts

E-mail recipients configured to receive PowerMIB-related events with Event Level set to **Major** will receive the following e-mails whenever the state of the contact being monitored changes from its normal state:

Table 9. Event Level Major E-mail Examples

Subject Line	Message	Example
UPS Event #30	MAJOR: [xupsContactDescr] is Active	MAJOR: Contact #1 Status is Active
UPS Event #31	INFORMATIONAL: [xupsContactDescr] is Inactive	INFORMATIONAL: Contact #1 Status is Inactive

E-mail recipients configured to receive PowerMIB-related events with Event Level set to **All** will also receive:

Table 10. Event Level All E-mail Examples

Subject Line	Messages
ConnectUPS Agent Event	External Contact [xupsContactIndex] Monitoring Enabled External Contact [xupsContactIndex] Monitoring Disabled External Contact Monitoring Cable Installed External Contact Monitoring Cable Removed

Event Log Specifics

If the External Contact Monitoring feature is enabled, the following events will be written to the log as necessary:

```
[xupsContactDescr] Monitoring Enabled
[xupsContactDescr] Monitoring Disabled
External Contact Monitoring Cable Installed
External Contact Monitoring Cable Removed
[xupsContactDescr] is Active
[xupsContactDescr] is Inactive
```

HTML Summary Page Specifics

For each contact being monitored (enabled by the user), the appropriate status line is displayed on the card's Summary page. If the contact is enabled, the default text is the *xupsContactDescr* for that contact.

Table 11. Summary Page HTML Text

Default Text	Valid States	Description
External Contact #1 Status	Active	External contact notice exists
External Contact #2 Status	Inactive	External contact notice does not exist
	Disabled	External contact monitoring has been disabled (contact monitoring cable installed, but user has not enabled the particular contact to be monitored)

NOTE If the user removes the contact monitoring cable from the card, the status line is dynamically removed from this page.

Configuration Menu Settings

This section describes the available settings provided by the built-in menus.

Set the IP Address, Gateway Address and MIB System Group

Use this function (option 1) to set the IP address, the gateway address, or the management information base (MIB) parameters of the card, as listed in Table 12.

Table 12. Parameters with Examples

No.	Function	Description	Example
1	IP Address	IP address of the card	192.72.173.188
2	Gateway Address	Default IP address of the network gateway	192.72.173.254
3	Network Mask	Subnet mask setting	255.255.255.0
4	sysContact	System contact string of MIB (up to 127 characters)	Eaton
5	sysName	System name parameter for MIB (up to 127 characters)	ConnectUPS Web/SNMP Card
6	sysLocation	System location parameter for MIB (up to 127 characters)	TEST LAB

Set Web/SNMP Card Control Group

For those users who intend to use BOOTP/DHCP, Telnet, or secure HTTP in order to configure, control, update, or manage the card, certain control parameters must be enabled or disabled. Use this function to modify those parameters (option **2**).



NOTE To prevent unauthorized viewing of the Web pages presented by the ConnectUPS Web/SNMP Card, use this function to enable HTTP Security Control.

NOTE To obtain an IP address using BOOTP/DHCP (instead of serial configuration), set DIP Switch 2 on the front panel to the ON position (OFF is the default).

Set Write Access Managers

For those users who intend to use an SNMP-compatible NMS to manage the ConnectUPS Web/SNMP Card, the IP address of the management station must be added to the list on the ConnectUPS Web/SNMP Card in order to receive read (get) or write (set) access rights. Community strings may be different for read or write access. Use this function to add or delete the IP address of the management station (option **3**).

Set Trap Receivers

For those users who intend to use an SNMP-compatible NMS to manage the ConnectUPS Web/SNMP Card, the IP address of the machine intended to be the trap receiver must be added to the list on the ConnectUPS Web/SNMP Card. Use this function to add or delete the IP address of the trap receivers (option **4**). This information is accessible via the HTTP interface for easy modification after the card is on the network.

Set IP Addresses of Primary and Secondary Date Server

Use this function to set the IP addresses of the primary and secondary date servers (option **5**). This information is accessible via the HTTP interface for easy modification after the card is on the network.

Computer systems with the ConnectUPS Web/SNMP Card-compatible NetWatch client software are periodically monitored by the ConnectUPS Web/SNMP Card to maintain a consistent date and time with your network. The computer's IP address must be listed as the Primary or Secondary Date Server.

UPS Event Actions

Use this function to configure actions that the ConnectUPS Web/SNMP Card performs during AC Fail and Low Battery events (option **6**). This information is accessible via the HTTP interface for easy modification after the card is on the network.

Set UPS Information

Use this function to enter additional information about the UPS including date of installation and date of last battery replacement (option **7**). In addition, set timing values relating to the shutdown and restart of the UPS. This information is accessible via the HTTP interface for easy modification after the card is on the network.

Set Superuser Name and Password

Use this function to set or change the username and password of the administrator who will use a Web browser to configure the ConnectUPS Web/SNMP Card (option **8**).

Email Notification

Use this function to inform selected e-mail accounts of events and changes in the status as they occur in the UPS or to provide a daily status message at a predetermined time (option **9**). This information is accessible via the HTTP interface for easy modification after the card is on the network.

Set Website Links

Use this function to set links to different Web sites (option **10**). Links appear on the Web pages of the ConnectUPS Web/SNMP Card. This information is accessible via the HTTP interface for easy modification after the card is on the network.

Card Settings and Event Log Summary

Use this function to display each configuration menu and the current settings (option **11**). The card's current data and event logs are also displayed.

This data may be accessed via a terminal program using the configuration cable or through a Telnet connect. Displaying and capturing the configuration items and log entries is helpful in service-related situations.

Set External Contact Monitoring

With the ConnectUPS Web/SNMP Card (firmware v3.00 and higher), two separate contact closures are supported. Examples of contact devices include rack-door switches, water detectors, and fire detectors. Select option **12** to configure this feature. The External Contact Monitoring screen opens (see Figure 13).

```

=====+
|           [ ConnectUPS Web/SNMP Card Configuration Menu ]           |
+=====+

  1. External Contact #1 Name: External Contact #1 Status
  2. External Contact #1 Type: Disabled
  3. External Contact #2 Name: External Contact #2 Status
  4. External Contact #2 Type: Normally Closed

  0. Return to previous menu

Please Enter Your Choice =>_

```

Figure 13. External Contact Monitoring Screen

By changing the External Contact Name (maps to PowerMIB *xupsContactDescr*), you can define the label text of the contact status field as displayed on the Summary page. The defaults are *External Contact #1 Status* and *External Contact #2 Status*.

The External Contact Type selection has three possible values:

- **Disabled** (Default) – maps to PowerMIB *xupsContactType = notUsed(4)*
- **Normally Open** – maps to PowerMIB *xupsContactType = normallyOpen(1)*
- **Normally Closed** – maps to PowerMIB *xupsContactType = normallyClosed(2)*

See “External Contact Monitoring Feature” on page 35 for required cabling and MIB variable information.

SSL Certificate Installation

Install the SSL security certificate according to the applicable instructions for your Web browser: Internet Explorer or Java Plug-in.



NOTE You can choose not to install the security certificate, although this is not recommended. Accessing the ConnectUPS Web/SNMP Card home page without the certificate will generate a warning message indicating the site may not be trustworthy (see Figure 14). You can accept the warning and continue; the SSL secure connections will still function.



Figure 14. Internet Explorer Warning Message



Figure 15. Java Plug-in Warning Message

Internet Explorer

To install the SSL certificate using Internet Explorer:

1. Open Internet Explorer.
2. Type `http://<IP Address>/rootcert.html` where <IP Address> is the one assigned to the card, and press Enter. The Download page opens (see Figure 16).

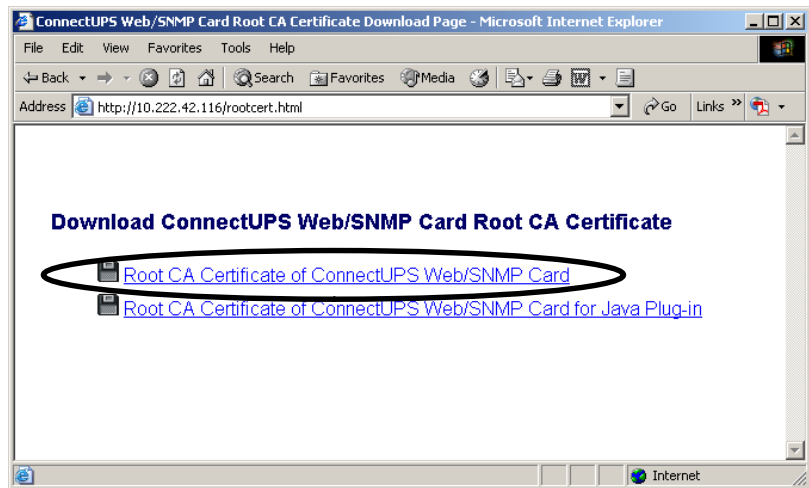


Figure 16. Download Page

3. Select **Root CA Certificate of ConnectUPS Web/SNMP Card**. The File Download dialog opens (see Figure 17).

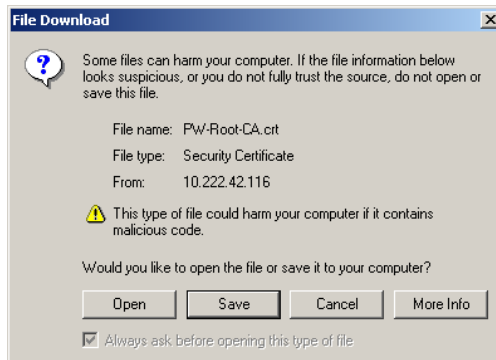


Figure 17. File Download Dialog

4. Select **Open**. The Certificate page opens (see Figure 18).

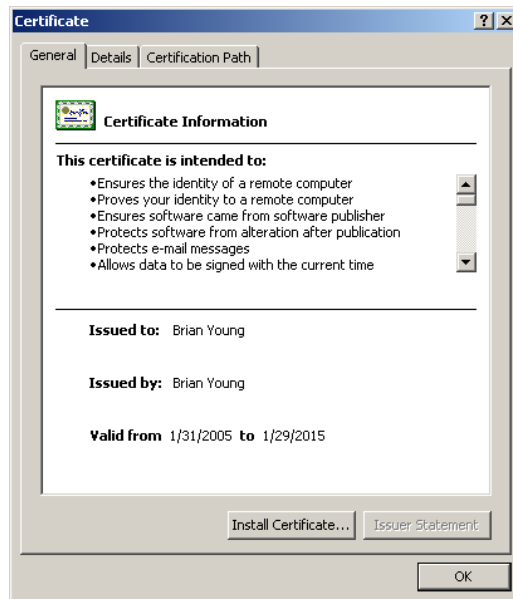


Figure 18. Certificate Page

5. Select **Install Certificate**. The Certificate Import Wizard starts (see Figure 19).
6. Select **Next**.



Figure 19. Certificate Import Wizard

7. Select **Automatically select the certificate store based on the type of certificate** and select **Next** (see Figure 20).

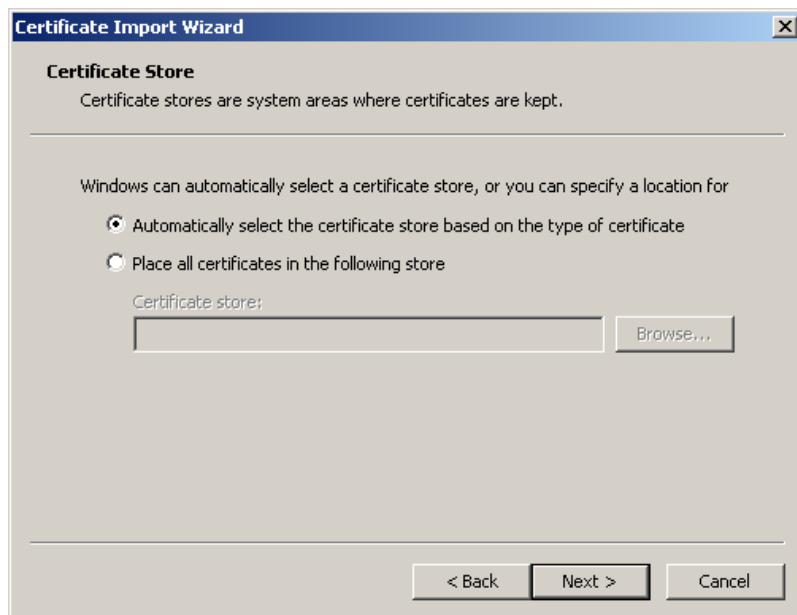


Figure 20. Certificate Store Menu

8. Select **Finish** and then **OK** to complete the installation (see Figure 21 and Figure 22).

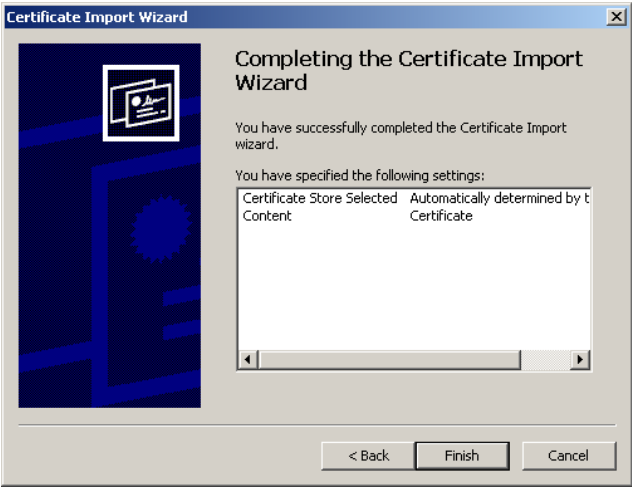


Figure 21. Completing the Certificate Import Wizard Screen

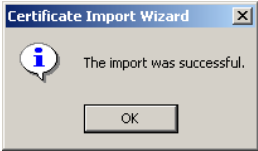


Figure 22. Success Screen

9. Request a secure, encrypted SSL Web connection by typing the URL of the card and pressing Enter. For example:

`https://<IP Address>/rootcert.html`

where <IP Address> is the one assigned to the card.

10. To verify that you have accessed a secure server, check the web address to confirm that it begins with "https://" and that a picture of a lock is in the lower right hand corner of the browser's window (see Figure 23).

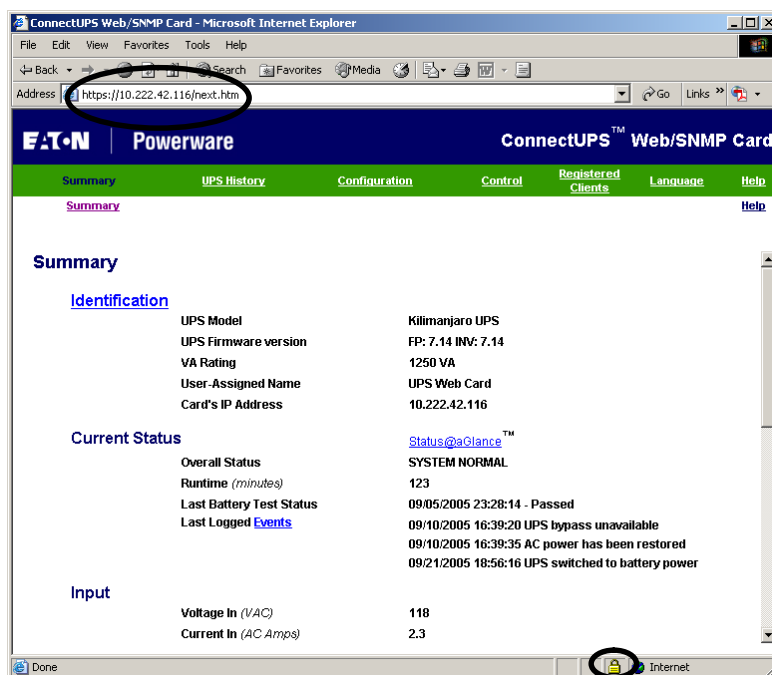


Figure 23. Secure Connection Window

Java Plug-in

To install the SSL certificate using Java Plug-in:

1. Open your browser.
2. Type `http://<IP Address>/rootcert.html` where <IP Address> is the one assigned to the card, and press Enter. The Download page opens (see Figure 24).

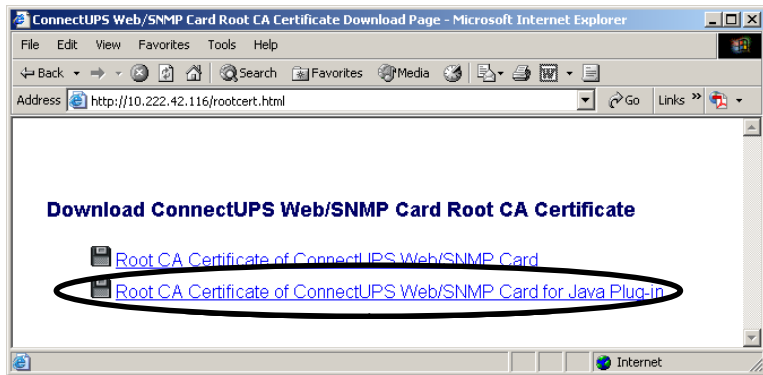


Figure 24. Download Page

3. Select **Root CA Certificate of ConnectUPS Web/SNMP Card for Java Plug-in**. The File Download dialog opens (see Figure 25).
4. Select **Save**.

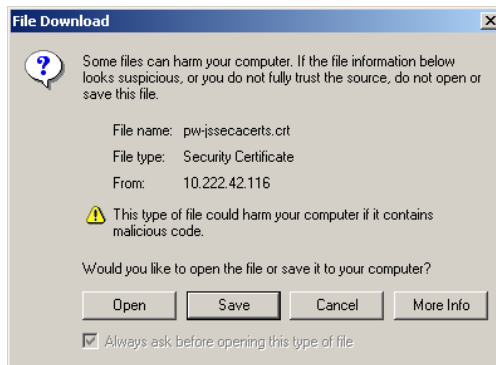


Figure 25. File Download Dialog

5. Specify the *lib\security* subdirectory in your Java Plug-in program folder for saving the certificate; then select **Save** (see Figure 26). The file begins downloading.

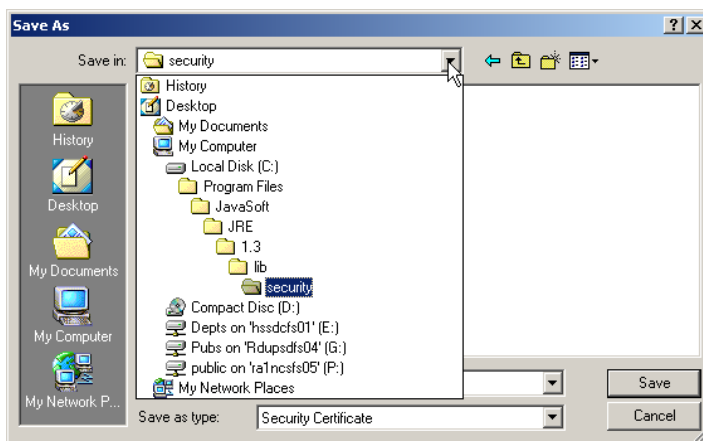


Figure 26. Save Menu

6. When the download is finished, rename the certificate file *pw-jssecacerts.crt* to *pw-jssecacerts* (see Figure 27).

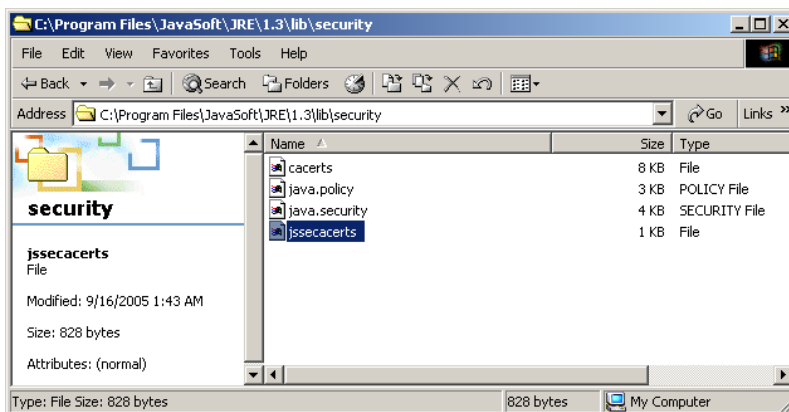


Figure 27. Rename Screen

SSH Installation

SSH is a software application used to log into another computer over a network and execute commands in a remote machine (typically a UNIX system, but also Microsoft Windows systems). It provides strong authentication and secure communication over unsecured channels.

Establishing an SSH Connection

To establish an SSH connection:

1. Install the SSL certificate (see “SSL Certificate Installation” on page 44).
2. Start your SSH-compatible application (such as *putty.exe*).
3. On the Session Screen, enter the card's Host Name or IP address (see Figure 28).

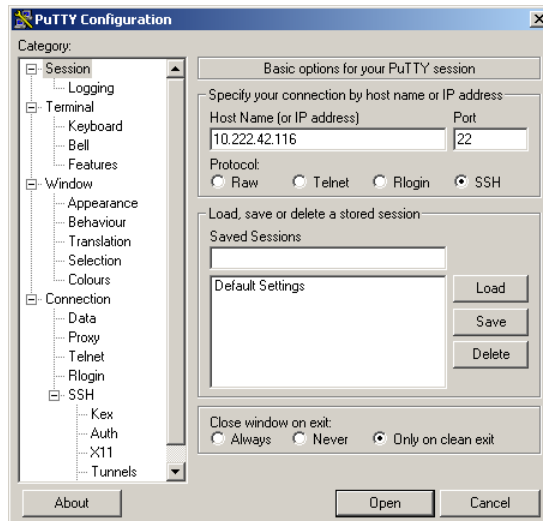


Figure 28. Example Configuration - Session Screen

4. Select **SSH** in the Category column. The SSH Connection screen opens (see Figure 29).
5. Select **1 only** for the Preferred SSH protocol version.

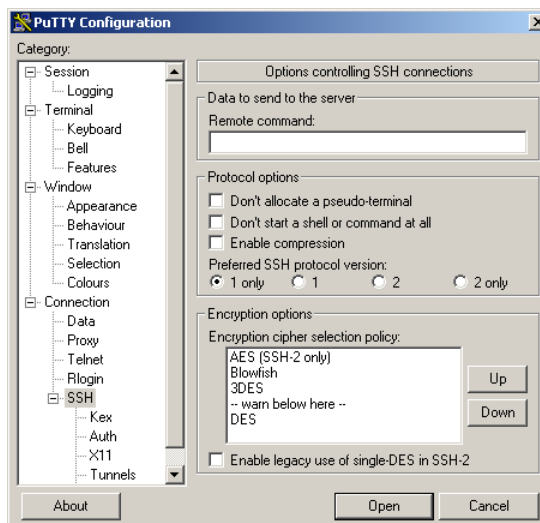


Figure 29. Example Configuration - SSH Connection Screen

6. Select **Open**. The login prompt window opens (establishing communication may take 10–20 seconds). See Figure 30.

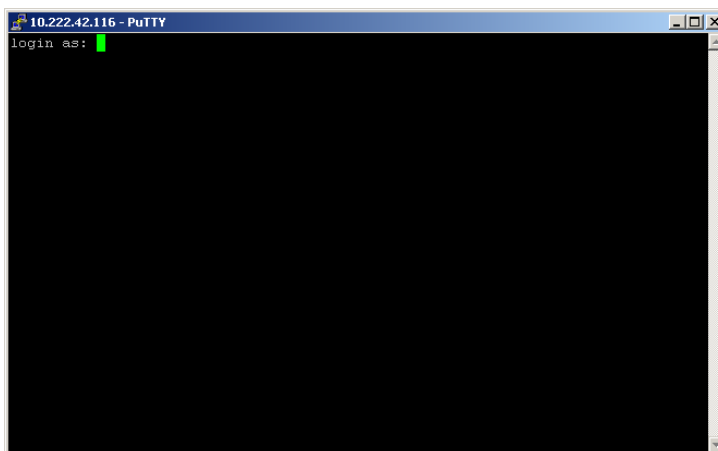


Figure 30. Login Prompt Window

- 7. Log in with the *username* and *password*. The default username and password is admin (see Figure 31).

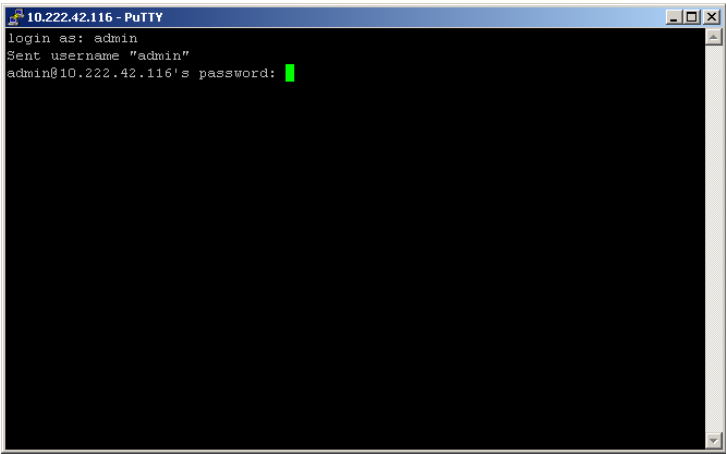


Figure 31. Username and Password Window

- 8. Press Enter. The ConnectUPS Web/SNMP Card menu window opens (see Figure 32).

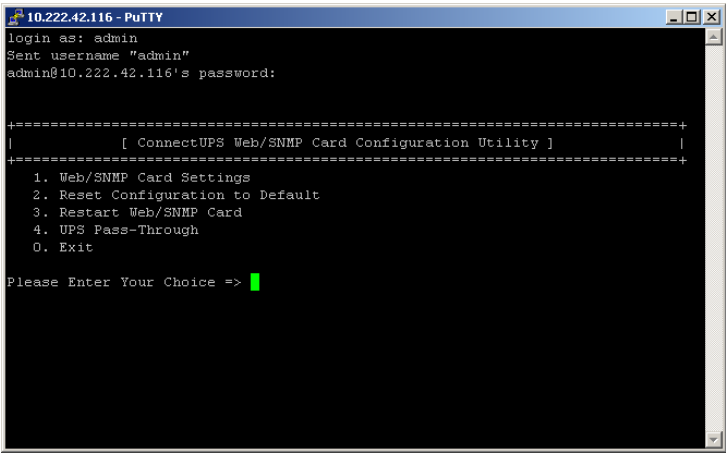


Figure 32. ConnectUPS Web/SNMP Card Menu Window

Service and Support

If you have any questions or problems with the ConnectUPS Web/SNMP Card, call your **Local Distributor** or the **Help Desk** at one of the following telephone numbers and ask for a ConnectUPS Web/SNMP Card technical representative.

United States: **1-800-356-5737 or 1-919-870-3149**
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.

Two-Year Limited Warranty (USA and Canada)

Eaton Connectivity Devices

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 3, 5, and 9 series Connectivity Devices (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. For comments or questions about this Warranty, write to the Customer Quality Representative, 3301 Spring Forest Road, Raleigh, North Carolina 27616 USA.