



Hewlett Packard
Enterprise

HPE UPS Network Module

User Guide

Abstract

This document includes installation, configuration, and operation information for the HPE UPS Network Module. This document is for the person who installs and maintains power products. Hewlett Packard Enterprise assumes you are qualified in the servicing of high-voltage equipment and trained in recognizing hazards in products with hazardous energy levels.

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Introduction

Overview

The HPE UPS Network Module works with HPE Power Protector software to monitor, manage, and protect power environments. The UPS Network Module can send email and text notification messages to configured recipients and alert traps to specified SNMP management programs, such as HPE Systems Insight Manager, or used as a stand-alone management system.

NOTE: Text notification on mobile phones require the use of an external provider that converts emails into text notifications on mobile phones.

The HPE UPS Network Module includes:

- HPE UPS Network Module web interface—A graphical interface that is accessed with a web browser
- HPE UPS Network Module Configuration Menu—A text-based menu that is accessed through a terminal emulation session

For a detailed list of supported UPSs, see the Hewlett Packard Enterprise website (<http://www.hpe.com/info/rackandpower>).

Features

The UPS Network Module is a minislots card that requires UPSs equipped with a minislots. The UPS Network Module:

- Monitors the status, performs UPS diagnostics, and transmits periodic reports.
- Manages independent UPS load segments to provide separate power control of connected equipment.
- Prioritizes the timing of equipment shutdown and reboots connected equipment by load segment.
- Delays restart by load segment after a power outage to sequence the startup of system components.
- Shuts down and reboots the UPS and attached equipment, based on a user-specified schedule.
- Sends customized email, broadcast, and text notification messages and SNMP traps.
- Displays logs for analysis.
- Includes enhanced HPE SIM integration.
- Includes multi-language support.
- Supports IPv4 and IPv6.
- Provides automatic date and time adjustment through an NTP server.
- Supports fast Ethernet 10/100 MB compatibility with auto-negotiation on the RJ-45 network port.
- Allows for installation while the UPS is online, to maintain the highest system availability.

When used in conjunction with the UPS Network Module, HPE Power Protector:

- Manages an automatic, graceful shutdown of attached equipment during a utility power failure.
- Issues computer commands at power failure.
- Supports network-attached server communications.

- Supports a customizable Events script.
- Provides redundancy feature support.
- Is compatible with the R1500 G4 UPS, R/T2200 G4 UPS, R/T3000 G4 UPS, R5000 UPS and R7000 UPS.

For more information, see the *HPE Power Protector User Guide* on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/rackandpower>).

UPS models other than G4 have two groups of load segments. G4 UPS has three groups of load segments. Throughout this document, references to "entire UPS" apply to UPS models other than G4 and references to "master outlets" apply to the G4 UPS. Where applicable, screens are provided for both types of UPS models.

HPE Power Protector overview

HPE Power Protector is a UPS software management application that can be used standalone without the UPS Network Module in an Administrator/Client configuration or with the UPS Network Module in a Client configuration only.

The HPEPP Client runs on a local or network server and allows the UPS Network Module to gracefully shut down the operating system of that server and optionally run a script during power failure. Install the HPEPP Client on any machine that is powered by the UPS and any machine that the UPS Network Module uses to initiate a shutdown command.

For more information, see the *HPE Power Protector User Guide* on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/rackandpower>).

You can also use a third-party SNMP manager to monitor the power protection. For more information, see "SNMP monitoring (on page 54)."

Supported hardware configurations

The UPS Network Module can be attached in any of the following configurations:

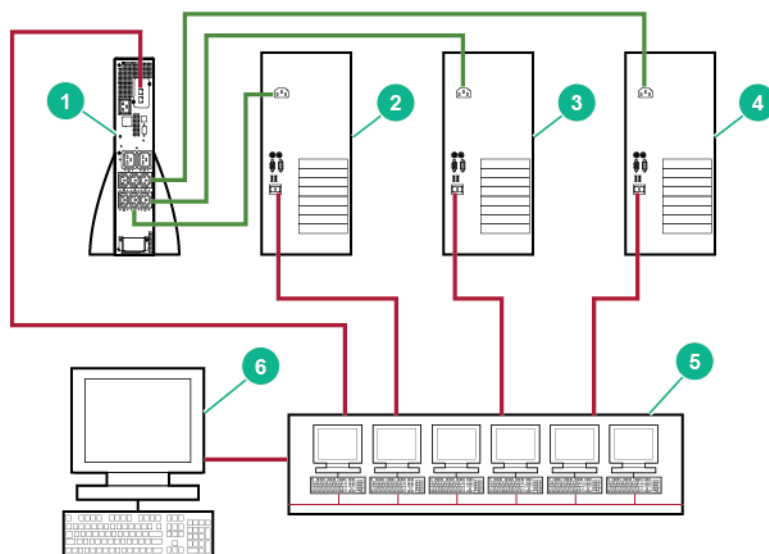
- Configuration A—One or more HPEPP Clients are powered by a UPS and communicate with one UPS Network Module over the network.
- Configuration B (on page 7)—One or more HPEPP Clients are redundantly powered by two UPSs and communicate with two UPS Network Modules over the network.

Configuration A

This figure illustrates one or more HPEPP Clients powered by a UPS and communicating with one UPS Network Module over the network to begin a graceful shutdown in the event of a power failure or other configured shutdown event.



IMPORTANT: Up to 35 HPEPP Clients can be managed by one HPE UPS Network Module. No dedicated HPEPP Administrator server is needed.

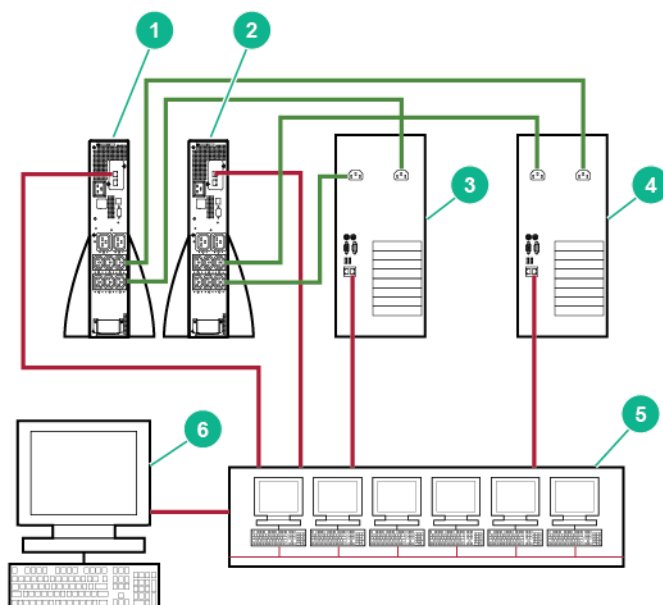


Item	Description
1	UPS with an HPE UPS Network Module
2	HPEPP Client server
3	HPEPP Client server
4	HPEPP Client server
5	Network
6	Remote workstation browsing into the HPE UPS Network Module or HPEPP Client over the network
Green	Power connection
Red	Communication path

Configuration B

This figure illustrates one or more HPEPP Clients are redundantly powered by two UPSs and communicate with two UPS Network Modules over the network to begin a graceful shutdown in the event of a power failure or other configured shutdown events.

NOTE: Up to 35 HPEPP Clients can be managed by one HPE UPS Network Module.



Item	Description
1	UPS with an HPE UPS Network Module
2	UPS with an HPE UPS Network Module
3	HPEPP Client server
4	HPEPP Client server
5	Network
6	Remote workstation browsing into the UPS Network Module or HPEPP Client over the network
Green	Power connection
Red	Communication path

Web interface requirements

The following table lists the minimum requirements necessary to operate the UPS Network Module web interface.

Software	Browser
Internet Explorer	- Windows Internet Explorer 10 - Windows Internet Explorer 11
Mozilla	Mozilla Firefox 31.0
Google	Chrome 35.0.1916

Operating system requirements

The following table lists the supported environments to operate the UPS Network Module system.

Software	Operating system
Microsoft Windows	• Windows Server 2012 • Windows Server 2012 R2 • Windows Server 2008 • Windows Server 2008 R2 • Windows Server 2003 R2 • Windows 8.1 • Windows 8.0 • Windows 7.0 • Windows Vista
Linux	• Red Hat Enterprise Linux 7.0 • Red Hat Enterprise Linux 6.6 • Red Hat Enterprise Linux 6.5 • Red Hat Enterprise Linux 5.11 • Red Hat Enterprise Linux 5.10 • SUSE Linux Enterprise Server 12 • SUSE Linux Enterprise Server 11
UNIX	• HP-UX 11i v3 • HP-UX 11i v2
VMware	• ESXi 6.0 • ESXi 5.5 • ESXi 5.1 (pay version only) • ESXi 5.0 (pay version only) • ESX 4.1 (pay version only) • ESXi 4.1 (pay version only)
Microsoft Hyper-V	• Microsoft Hyper-V Server 2012 • Microsoft Hyper-V Server 2008
Citrix Xen	• Citrix XenServer 6.0 • Citrix XenServer 5.6

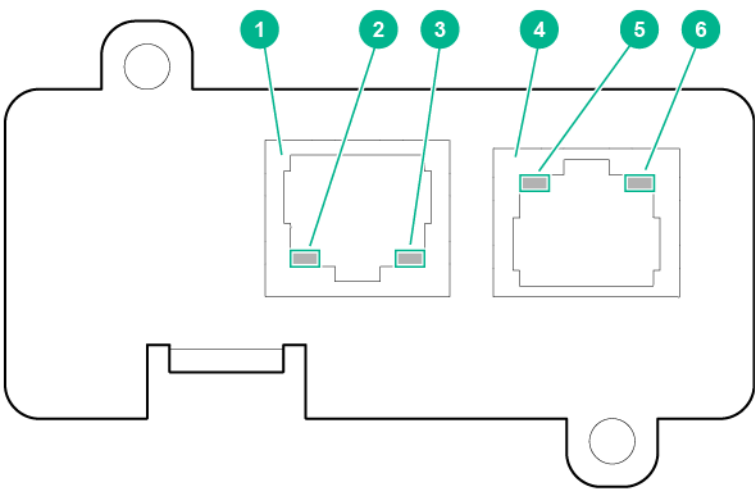
Quick installation and setup overview

1. Install the UPS Network Module and configure the network settings. For more information, see "Installing the UPS Network Module (on page 11)."
2. Access the web interface.
3. Configure the power fail settings using the Shutdown Parameters screen (on page 35).
4. Configure additional settings using the menus under Settings (on page 29), (optional).
5. Install and configure the HPEPP Client on all servers to be protected by the UPS. After all Clients are configured at the servers, they are automatically added by the UPS Network Module and appear on the Notified Applications screen (on page 43).

For more information, see the *HPE Power Protector User Guide* on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/rackandpower>).

Component identification

Front panel connectors and LED indicators



Item	Connector/LED	Description
1	Network connector	Ethernet port
2	Network Activity LED	- Off—UPS Network Module not connected to the network - Solid green—UPS Network Module connected to the network, but no activity detected - Flashing green—UPS Network Module connected to the network and sending or receiving data
3	Network Speed LED	- Off—Port operating at 10 Mb/s - Solid orange—Port operating at 100 Mb/s
4	Settings/AUX connector	Configuration port
5	UPS Data LED	- Off—UPS Network Module starting - Solid green—UPS Network Module communicating with UPS - Flashing green—Normal operation (communication link established)
6	Configuration Menu LED	- Off—Configuration menu activated - Solid orange—Normal operation (Configuration menu not activated)

Installing the HPE UPS Network Module

Precautions

See the *Important Safety Information* guide (included in the UPS kit) before installing this product.



WARNING: A risk of personal injury from electric shock and hazardous energy levels exists. The installation of options and routine maintenance and service of this product must be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with AC power products.

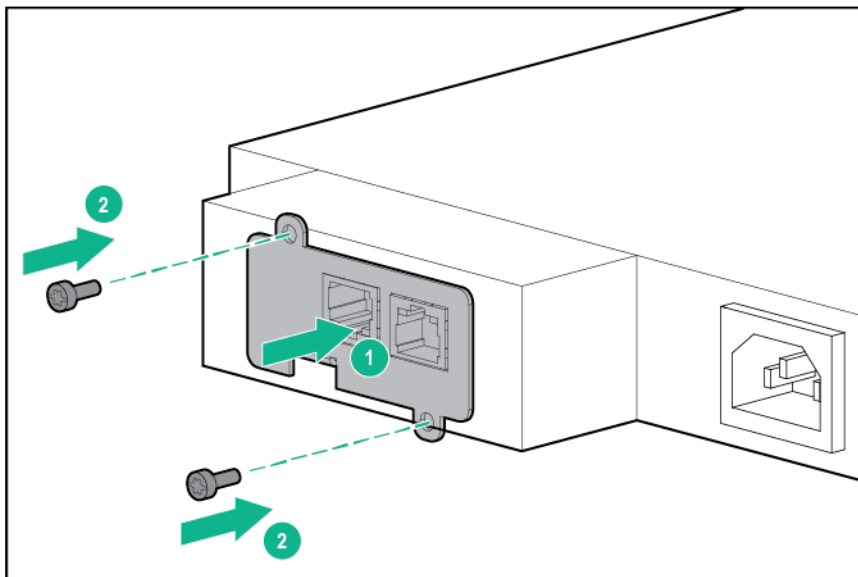
Required tools

No. 2 Phillips screwdriver

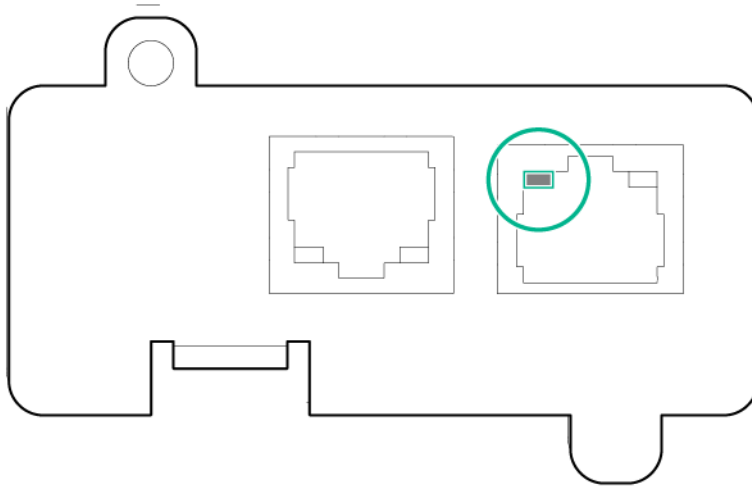
Installing the UPS Network Module

NOTE: It is not necessary to power down the UPS before installing the UPS Network Module.

1. Remove the two screws securing the UPS option slot cover plate and slide the plate out.
2. Install the UPS Network Module along the alignment channels in the option slot.



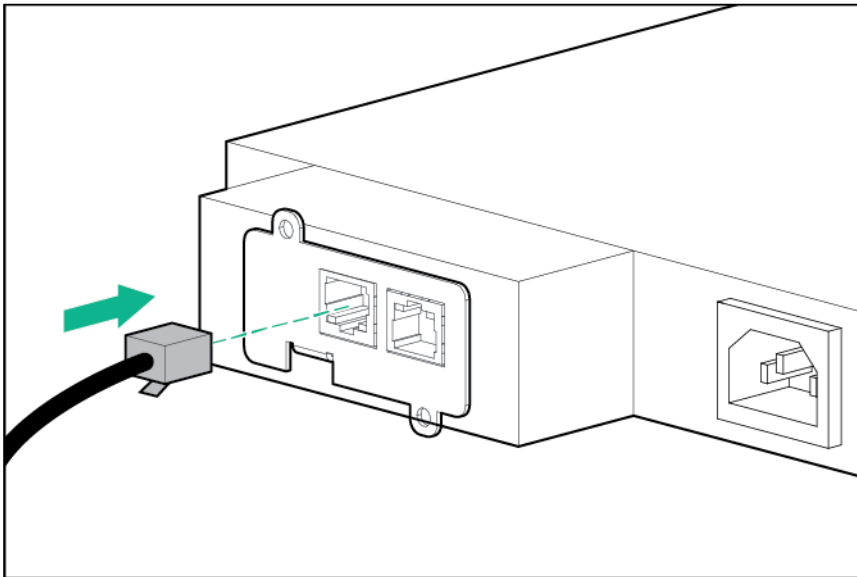
3. If the UPS is powered up, you can be sure that the UPS Network Module is seated properly and communicating with the UPS by verifying that the UPS Data LED illuminates solid green, and then flashes regularly after 2 minutes.



4. Secure the UPS Network Module using the two screws you removed in step 1.

Connecting the network cable

Connect a standard Ethernet cable between the network connector on the UPS Network Module and a network jack.

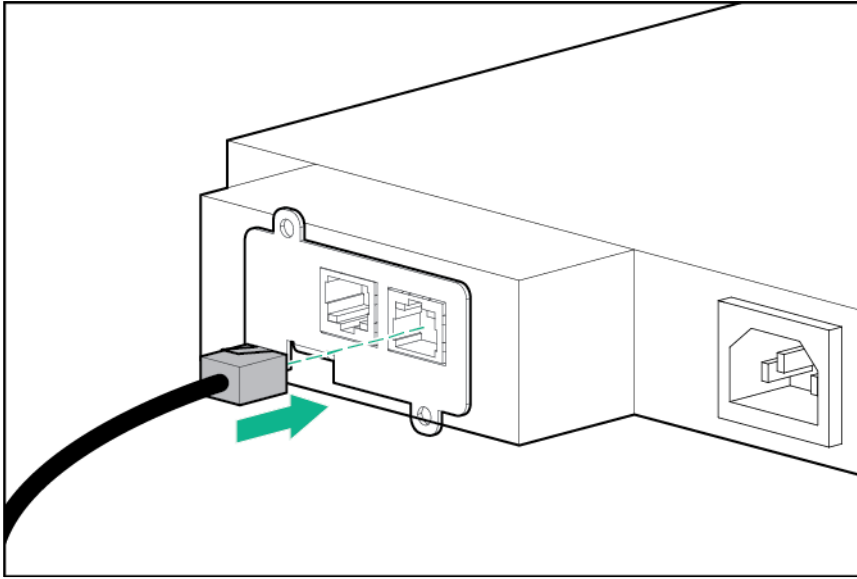


This connection is used to access the UPS Network Module remotely through the web interface. The UPS Network Module also uses the network connection to communicate to the configured HPE Power Protector Clients and to facilitate SNMP-based monitoring.

Connecting the configuration cable

1. Connect the DB-9 connector on the DB-9 to RJ-45 cable to a serial connector on the host computer.

2. Connect the RJ-45 connector on the DB-9 to RJ-45 cable to the Settings/AUX connector on the UPS Network Module.



This connection is used to access and configure the UPS Network Module network settings locally through a terminal emulation program.

Launching a terminal emulation program

NOTE: HyperTerminal is the serial communication program provided with Microsoft® Windows® and is used in this section as an example for setting up a terminal emulation session. If you are using another utility, the steps might be different.

1. Be sure that the UPS is powered on.
2. On the host computer, click **Start**, and select **Programs>Accessories>Communications>HyperTerminal**.
The Connection Description window appears.
3. Enter a description, select an icon for the connection, and then click **OK**. The Connect To window appears.
4. Select the serial connector on the host computer to which the DB-9 to RJ-45 adapter is attached, and then click **OK**. The COM Properties window appears.
5. Select the following parameter values, and then click **OK**.
 - Bits per second—9600
 - Data bits—8
 - Parity—None
 - Stop bits—1
 - Flow control—None

Configuring the UPS Network Module network settings

On the terminal emulation session screen running on the host computer:

1. Press any key. The initialization process completes, and then you are prompted to enter the password.
2. At the prompt, enter `admin`. The HPE UPS Network Module Configuration Menu appears.
Use the HPE UPS Network Module Configuration Menu to configure the minimum settings required to access the UPS Network Module remotely.



IMPORTANT: The IP address assigned to the UPS Network Module must be fixed. If the IP address changes:

- The HPE Power Protector Client loses communication with the UPS Network Module.
 - You can lose track of the UPS Network Module URL.
-

3. If your network is configured with a DHCP server, the network settings are automatically assigned. To view the settings:
 - a. On the Main menu, enter `2` to display the Network Configuration submenu.
 - b. Enter `1` to view the network settings.
 - c. Record the IP address.
 - d. Enter `0` to return to the Main menu.
 - e. Enter `0` to exit the Configuration Menu. The UPS Network Module is operational.

NOTE: You can configure the DHCP server to permanently assign the same IP address for each UPS Network Module using the MAC address of the card.

4. If your network is not configured with a DHCP server:
 - a. On the Main menu, enter `2` to display the Network Configuration submenu.
 - b. Enter `2` to modify the network settings.
 - c. Follow the on-screen instructions to enter the static IP parameters. A `Done` message appears when the parameters are saved.
 - d. Enter `0` to return to the Main menu.
 - e. Enter `1` to reset the UPS Network Module, and then enter `2` to restart the UPS Network Module with the new IP settings.

HPE UPS Network Module web interface

HPE UPS Network Module web interface overview

The web interface graphically displays various measurements and warning and alarm messages from the UPS Network Module. Also, system values and power fail settings can be configured through the web interface and saved to the UPS Network Module.

NOTE: Network settings included on the UPS Network Module web interface can also be configured using the HPE UPS Network Module Configuration Menu.

Accessing the web interface



CAUTION: It is highly recommended that browser access to the UPS Network Module is isolated from outside access using a firewall or isolated network.

To access the web interface:

1. On a network computer, launch a supported browser. The browser window appears.
2. In the URL field, enter:

`http://xxx.xxx.xxx.xxx`

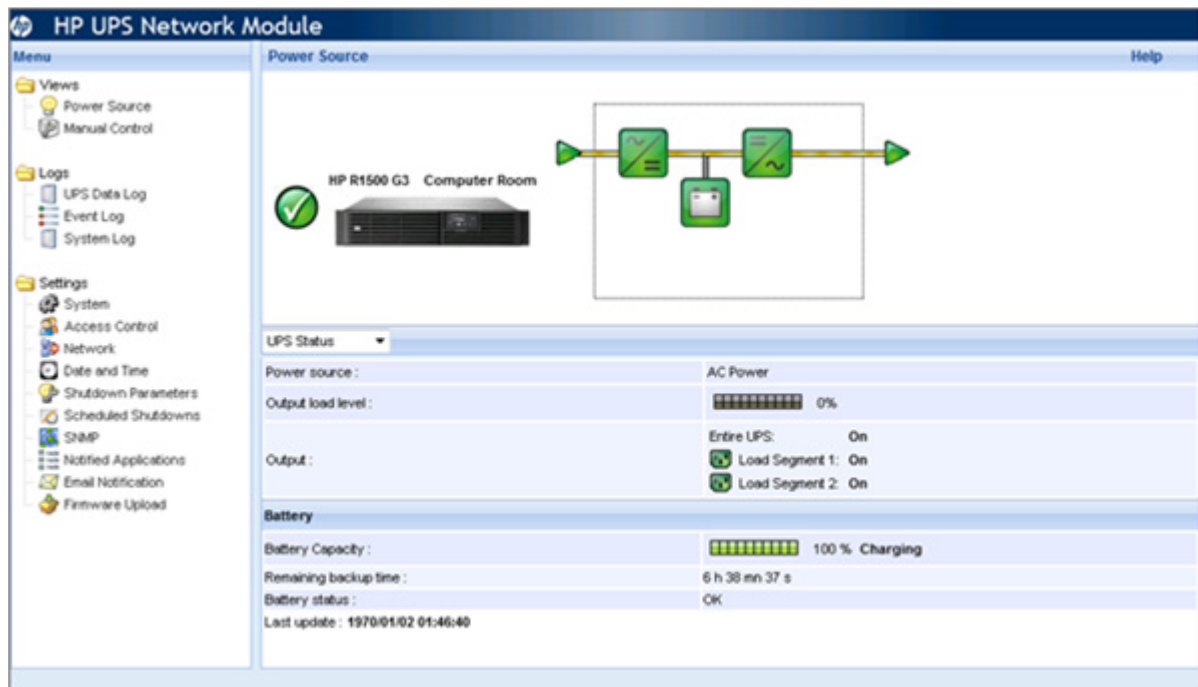
-or-

`https://xxx.xxx.xxx.xxx`

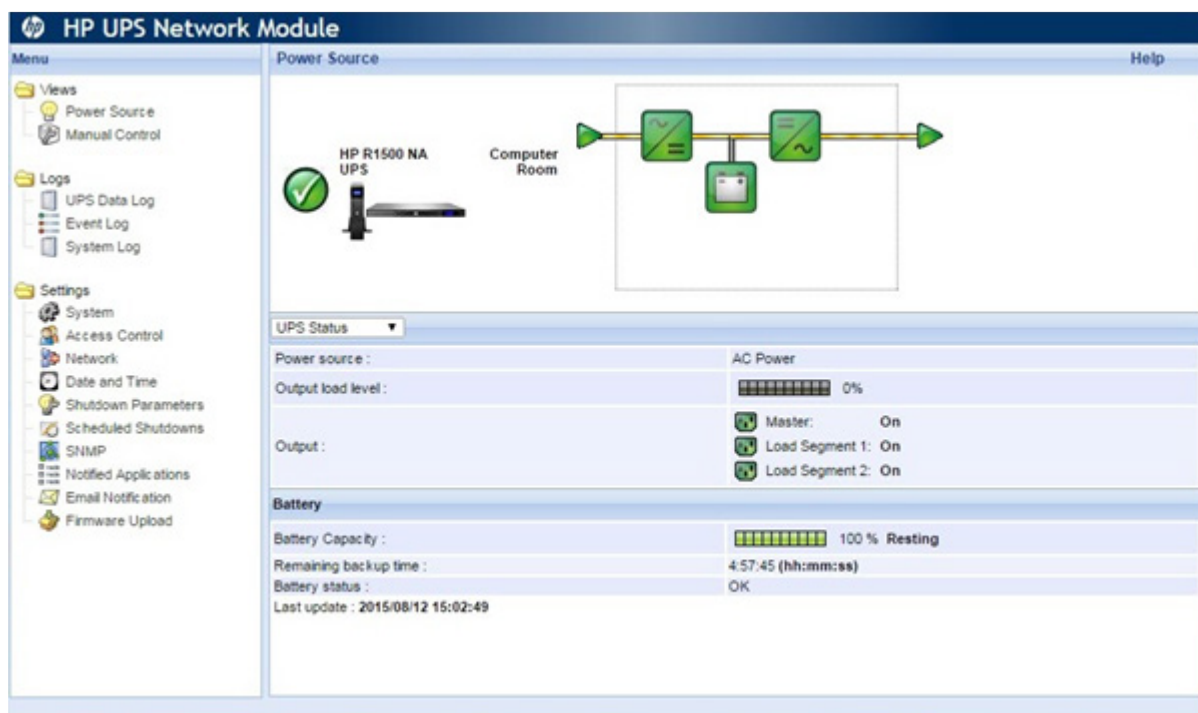
where `xxx.xxx.xxx.xxx` is the static IP address of the UPS Network Module. The login screen appears.

3. Enter the user name in the User Name field. The default user name is `admin`.
4. Enter the password in the Password field. The default password is `admin`.
5. Click **Sign In**. The HPE UPS Network Module web interface appears.

UPS models other than G4



G4 UPS



Browser security alert

Secure browsing requires the use of SSL. SSL is a protocol layer that lies between HTTP and TCP that provides secure communication between a server and a client, and is designed to provide privacy and message integrity. SSL is commonly used in web-based transactions to authenticate the web server, which indisputably identifies the server to the browser. SSL also provides an encrypted channel of

communication between the server and the browser. The encrypted channel ensures the integrity of the data between the web server and the browser, so that data can neither be viewed nor modified while in transit. The UPS Network Module uses a system generated and unique key.

An integral part of SSL is a security certificate, which identifies the UPS Network Module. If your browser displays a security alert when browsing to the UPS Network Module, it can be for one of several reasons:

- The certificate is untrusted, meaning it was signed by a certifying authority that is unknown to your browser.
- The certificate has expired or is not yet valid. This condition can occur if you issue your own certificate and it has expired.
- The name on the certificate does not match the name of the site in the browser address field.

For more information about security considerations, see "Security considerations overview (on page 68)."

Establishing a secure session for Internet Explorer

The first time you browse to the UPS Network Module, the Secure Session screen appears. To ensure a secure connection, verify that you are browsing to the desired UPS Network Module:

1. Click **View Certificate**.
2. Verify that the name in the Issued To field is the name of your UPS Network Module.
3. Perform any other steps necessary to verify the identity of the UPS Network Module.



CAUTION: If you are not sure this is the desired UPS Network Module, do not proceed. Importing a certificate from an unauthorized source relays your login credentials to that unauthorized source. Exit the certificate window and contact the system administrator.

After verifying the UPS Network Module, do one of the following:

- Import the certificate and proceed.
 - a. Click **View Certificate**. The certificate appears.
 - b. Click **Install Certificate**. The Certificate Import wizard runs.
 - c. Click **Next**. The Certificate Store screen appears.
 - d. Select **Automatically select the certificate store based on the type of certificate**, and then click **Next**.
 - e. Click **Finish**. A message appears, asking for verification of the root store.
 - f. Click **Yes**.
- Proceed without importing the certificate by clicking **Yes** at the Security Alert window. You continue to receive the Security Alert each time you log in until you import the certificate. Your data is still encrypted.
- Exit and import the certificate into your browser from a file provided by the administrator.
 - a. Click **No** at the Security Alert window.
 - b. Obtain an exported certificate file from the administrator.

NOTE: If using Internet Explorer, you can manually import the file into the browser by clicking **Tools>Internet Options>Content>Certificates>Import**.

Establishing a secure session for Mozilla

The first time you browse to the UPS Network Module, the Secure Session screen appears. To ensure a secure connection, verify that you are browsing to the desired UPS Network Module:

1. Click **Examine Certificate**.

2. Verify that the name in the Issued To field is the name or IP address of your UPS Network Module.
3. Perform any other steps necessary to verify the identity of the UPS Network Module.
4. After verifying the UPS Network Module, do one of the following:
 - a. Click either **Accept this certificate permanently** or **Accept this certificate temporarily for this session**.
 - b. Click **OK**.

NOTE: If using Mozilla, you can manually import the file into the browser by clicking **Edit>Preferences>Privacy & Security>Certificates>Manage Certificates>Authorities>Import**.

Establishing a secure session for Firefox

The first time you browse to the UPS Network Module, the Secure Session screen appears. To ensure a secure connection, verify that you are browsing to the desired UPS Network Module:

1. Click **I Understand the Risks**.
The Add Exception button appears.
2. Click **Add Exception**.
The Add Security Exception window appears.
3. To verify the certificate, click **View**.
4. Verify that the Issued To, Issued By, and Validity fields are accurate for your iPDU.
5. Perform any other steps necessary to verify the identity of the UPS Network Module.
6. After verifying the UPS Network Module, click either **Enable Permanently store this exception** to save the certificate permanently or **Disable Permanently store this exception** to accept the certificate temporarily for this session.
7. Click **Confirm Security Exception**.

NOTE: If using Firefox, you can manually import the file into the browser by clicking **Options>Advanced>View Certificates>Authorities>Import**.

Establishing a secure session for Google Chrome

To establish a secure session:

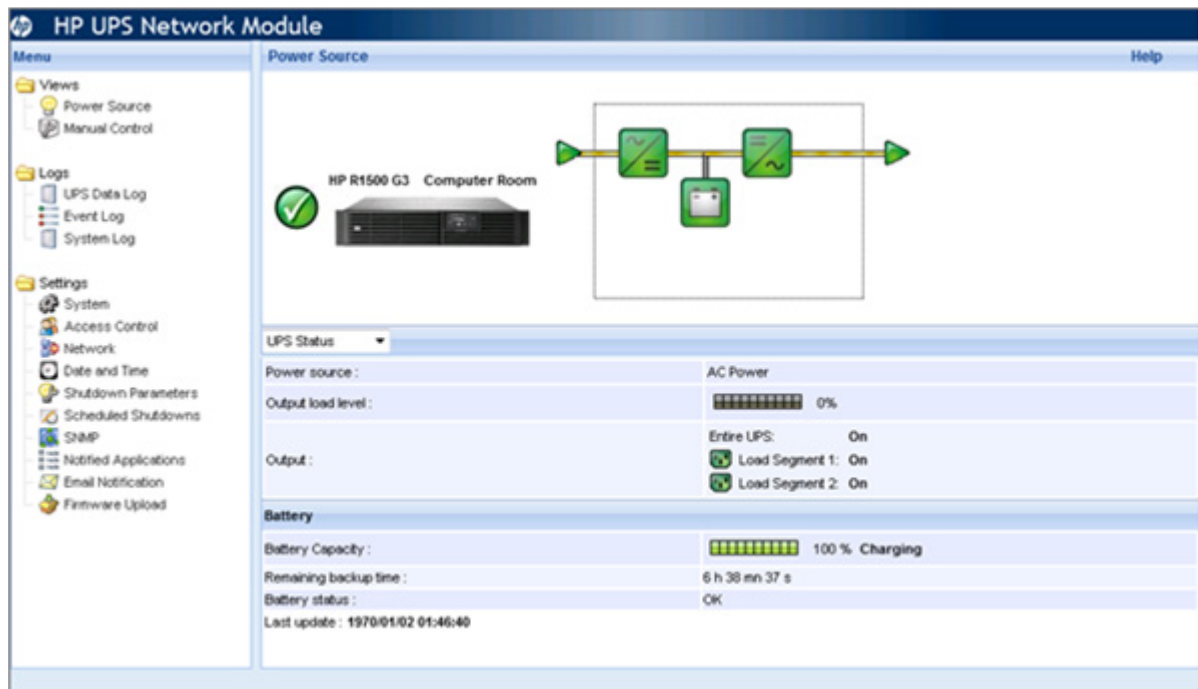
1. Browse to the UPS Network Module through a secure connection.
The certificate appears with a warning.
2. Click **Proceed anyway**, and then login to the UPS Network Module web interface.

Navigating the web interface

The web interface is divided into two frames:

- **Menu tree**—Contains a list of menu options on the left side of the screen
- **Main frame**—Contains the various interface screens based on the menu option selected in the left navigation frame

Click **Help** to view online help.



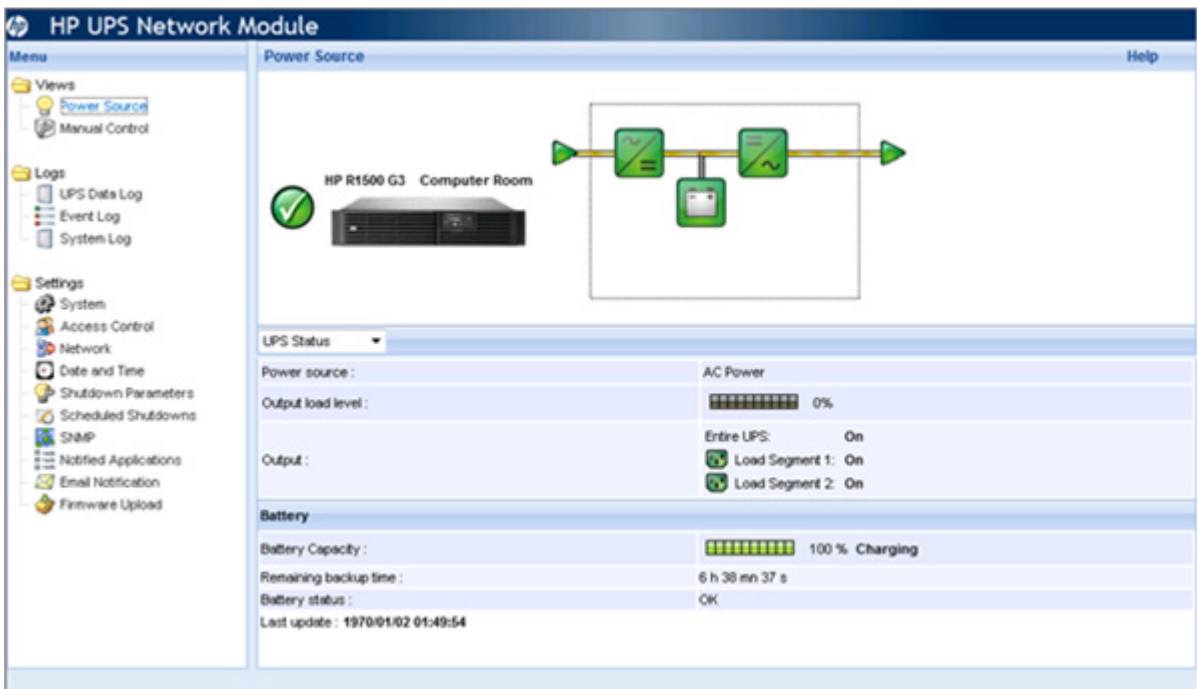
Views

Menu options listed under Views include:

- Power Source ("Power Source screen" on page 20)
- Manual Control

Power Source screen

Click **Power Source** in the menu tree to display the Power Source screen. This screen displays the overall status of the UPS. The status information refreshes every 10 seconds.



The top part of the screen displays the following UPS information:

- **UPS status icon**—The current UPS status

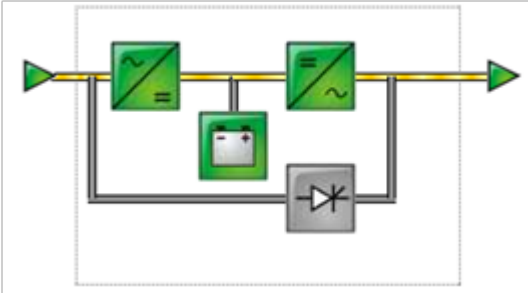
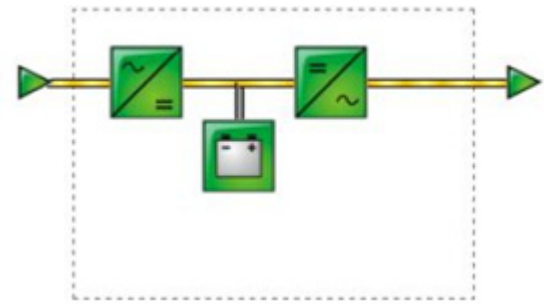
Status icon	Description
	Green—Normal operation
	Red—Alarm present Click the icon to display the UPS alarms.
	Gray—UPS communication loss

- **UPS name**—The name of the UPS
The UPS name is the generic name of the UPS model, and this name displays throughout the interface.
- **UPS location**—The location of the UPS
The UPS location can be modified on the System Settings screen (on page 30).
- **UPS graphical representation**—A graphical representation of the UPS model
- **UPS operating mode diagram**—An animated graphical representation of the UPS operating mode showing the main UPS components and the electrical flow powering the load
If communication with the UPS is lost, the diagram appears gray. Diagrams do not display for line-interactive UPSs.
- **UPS measurements**—A popup box that displays UPS data details
Hover your mouse over an element in the UPS operating mode diagram to display UPS data details. UPS data is available for Normal mode, Battery mode, and Bypass mode. The available UPS data depends on the UPS range. Available UPS information includes:

- **AC Output Voltage**—The UPS output voltage
- **AC Output Current**—The UPS output current
- **AC Output Frequency**—The UPS output frequency
- **Load Level**—The percentage of load at the UPS output
- **Apparent Power**—The UPS apparent power
- **Active Power**—The UPS active power

AC Output	
Voltage	209 V
Current	0.0 A
Frequency	60.0 Hz
Load level	0 %
Apparent Power	0.0 kVA
Active Power	0.0 kW

The following table describes the possible UPS operating mode diagrams.

Diagram	UPS operating mode
	UPS with automatic bypass
	UPS without automatic bypass

The following table describes the possible diagram elements.

Diagram element	Description
AC Normal Input	
	Green—In tolerance
	Gray—Out of tolerance
AC Normal Flow	
	Yellow—AC to DC converter powered by normal AC
	Gray—AC to DC converter not powered by normal AC
AC to DC Converter	

Diagram element	Description
	Green—Powered
	Gray—Not powered
	Red—Internal failure
<i>Battery</i>	
	Green—Remaining capacity > 50%
	Orange—Remaining capacity < 50%
	Red—Battery to be checked (battery test result)
<i>Battery Output Flow</i>	
	Yellow—AC to DC converter powered by battery
	Gray—AC to DC converter not powered by battery
<i>DC to AC Converter Input Flow</i>	
	Yellow—Energy flow present
	Gray—No energy flow
<i>DC to AC Converter</i>	
	Green—Powered
	Gray—Not powered
	Red—Internal failure
<i>DC to AC Converter Output</i>	
	Yellow—Energy flow present
	Gray—No energy flow
<i>AC Bypass Input</i>	
	Green—In tolerance
	Red—Out of tolerance
<i>AC Automatic Bypass Flow</i>	
	Yellow—Energy flow present
	Gray—No energy flow

Diagram element	Description
<i>AC Automatic Bypass Status</i>	
	Green—Powered
	Gray—Not powered
	Red—Internal failure
<i>AC Output Flow</i>	
	Yellow—Energy flow present
	Gray—No energy flow
<i>AC Output</i>	
	Green—Load protected
	Red—Load not protected

The bottom part of the screen displays various tables containing UPS information. The table that displays depends on your selection in the pull-down menu. Available options include:

- **UPS Status**—Provides essential information about the power status of the UPS
- **UPS Alarms** ("**UPS Alarms table**" on page 24)—Displays a list of current alarms
- **About your UPS** ("**About your UPS table**" on page 24)—Provides information about the model range and software version of the UPS and the UPS Network Module

UPS Status table

The UPS Status table displays the following basic information about power and output:

- **Power source**—Indicates whether the UPS is on utility power or running on the UPS battery
- **Output load level**—The power percentage used at the UPS output
- **Output**—Indicates whether the individual UPS outputs are protected
 - Entire UPS/Master Outlets—Indicates whether the UPS is on or the master outlets are on
 - Load segment 1 and Load segment 2—Indicates whether the controlled load segments (if available) are powered

A green outlet icon () indicates that the load segment is on. A red outlet icon () indicates that the load segment is off. A gray outlet icon () indicates that the load segment status is unknown.

- **Battery capacity**—The remaining percentage of battery charge and the battery status
 - Charging—Utility power is present and the battery charge is in progress
 - Discharging—The UPS is operating on battery power
 - Fault—The battery is faulty
- **Remaining backup time**—The estimated maximum battery backup time remaining before UPS shutdown
- **Battery status**—The result of the last automatic battery test run by the UPS

- OK—The test completed correctly.
- NOK—The battery needs to be checked.
- Deactivated—The automatic battery test was not validated on the UPS.
- Aborted—The automatic battery test was not completed on the UPS.

UPS Alarms table

The UPS Alarms table displays a list of current alarms with the following information:

- **Alarm type**—The date and time the alarm occurred
- **Alarm description**—A description of the alarm
- **Severity**—An icon that indicates the severity of the alarm

Icon	Alarm severity
	Normal
	Critical
	Warning
	Unknown

For a complete list of UPS alarms, see "UPS alarms (on page 69)."

About your UPS table

The About your UPS table displays the following hardware and firmware information for the UPS and the UPS Network Module.

- **UPS**
 - **UPS Name**—The name of the UPS
 - **UPS Part Number**—The part number for the UPS
 - **UPS Serial Number**—The serial number for the UPS
 - **UPS Firmware Revision**—The firmware version for the UPS
 - **Communication Board Firmware Revision**—The firmware version for the UPS internal communication board
- **UPS Network Module**
 - **Card Firmware Revision**—The firmware version for the UPS Network Module
 - **Card Part Number**—The model number for the UPS Network Module
 - **Card Technical Level**—The technical revision for the UPS Network Module
 - **Card Hardware Revision**—The hardware version for the UPS Network Module
 - **Card Serial Number**—The serial number for the UPS Network Module
 - **Card Ethernet MAC Address**—The MAC address for the UPS Network Module
 - **Card Ethernet Speed**—The port speed of the UPS Network Module

Manual Control screen

Click **Manual Control** in the menu tree to display the Manual Control screen. This screen allows an administrator to execute shutdown and restart sequences for the UPS and its controlled load segments. To prevent data loss, configure the time required to shut down each registered server using the Shutdown Parameters screen (on page 35).

UPS models other than G4

HP UPS Network Module

Manual Control

HP R1500 G3

Computer Room

Load Segment	Status	Control	Off Delay	Toggle Duration	On Delay
Entire UPS	On	None	0 sec	0 sec	0 sec
Load Segment 1	On	None	0 sec	0 sec	0 sec
Load Segment 2	On	None	0 sec	0 sec	0 sec

Execute Save

G4 UPS

HP UPS Network Module

Manual Control

HP R1500 NA UPS

Computer Room

Load Segment	Status	Control	Off Delay	Toggle Duration	On Delay
Master	On	None	0 sec	0 sec	0 sec
Load Segment 1	On	None	0 sec	0 sec	0 sec
Load Segment 2	On	None	0 sec	0 sec	0 sec

Execute Save

The status of each load segment is indicated by an icon. A green icon () indicates that the load segment is on. A red icon () indicates that the load segment is off. A gray icon () indicates that the load segment status is unknown.



IMPORTANT: The UPS has priority over the controlled load segments. Shutting down the UPS causes the load segments to shut down. Controlled load segments can only be restarted if the UPS is on.

Only users with administrator privileges can save command parameters and execute commands. To configure a command:

1. Select the command you want to run in the Control pull-down menu. Configured commands will not initiate until you click **Execute**.
 - o **Safe power down**—A shutdown sequence for the load segment is launched immediately. Connected equipment powers off, and then the load segment powers off.
 - o **Safe power down & reboot**—A sequence containing a shutdown command followed by a restart command for the load segment is launched immediately. Connected equipment powers off, and then the load segment powers off. The load segment restarts when the Toggle Duration time is reached.
 - o **Immediate On**—A restart sequence for the load segment is launched immediately. The load segment powers on, and then connected equipment powers on.
 - o **Delayed, safe power down**—A shutdown sequence for the load segment is launched when the Off Delay time is reached. Connected equipment powers off, and then the load segment powers off.
 - o **Delayed, safe power down & reboot**—A sequence containing a shutdown command followed by a restart command for the load segment is launched when the Off Delay time is reached. Connected equipment powers off, and then the load segment powers off. The load segment restarts when the Toggle Duration time is reached.
 - o **Delayed On**—A restart sequence for the load segment is launched when the On Delay is reached. The load segment powers on, and then connected equipment powers on. The maximum "Delayed On" value is 32000 seconds.
2. Configure the Off Delay time for delayed power down commands. Enter the number of seconds that should elapse between the time you execute the command and the shutdown sequence initiates.
3. Configure the Toggle Delay time for power down & restart commands. Enter the number of seconds that should elapse between the time the shutdown sequence completes and the restart sequence initiates.
4. Configure the On Delay time for power on commands. Enter the number of seconds that should elapse between the time you execute the command and the restart sequence initiates.
5. Click **Save** to save the Off Delay, Toggle Delay, and On Delay parameters.
6. Click **Execute** to initiate the configured commands.

Click **Help** to view online help.

Logs

Menu options listed under Logs include:

- UPS Data Log ("[UPS Data Log screen](#)" on page 26)
- Event Log ("[Event Log screen](#)" on page 28)
- System Log ("[System Log screen](#)" on page 29)

UPS Data Log screen

Click **UPS Data Log** in the menu tree to display the UPS Data Log screen. This screen displays a log of UPS data collected by the UPS Network Module. The frequency at which data is collected can be modified on the System Settings screen (on page 30). By default, data is collected every 60 seconds.

NOTE: In the UPS Data Log and the Event Log, the date and time stamps are converted to the local time zone.

HP UPS Network Module

UPS Data Log

HP R1500 G3

Computer Room

Save Log Clear Log

Date	Time	AC Normal		AC Output				Battery	
		Voltage	Frequency	Voltage	Frequency	Power(kVA)	Load level(%)	Capacity(%)	Remaining time(mn)
1970/01/01	22:23:32	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:24:37	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:25:36	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:26:37	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:27:37	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:28:37	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:29:37	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:30:37	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:31:37	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:32:38	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:33:37	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:34:37	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:35:38	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:36:39	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:37:38	124	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:38:39	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:39:40	124	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:40:40	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:41:40	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:42:41	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:43:42	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:44:41	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:45:43	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:46:42	124	60.0	124	60.0	0.0	0	100	398
1970/01/01	22:47:43	122	60.0	122	60.0	0.0	0	100	398
1970/01/01	22:48:44	124	60.0	124	60.0	0.0	0	100	398

The following information is displayed for a single phase UPS:

- **AC Input Voltage**—The utility voltage supplying the UPS
- **AC Input Frequency**—The utility frequency supplying the UPS
- **AC Output Voltage**—The UPS output voltage
- **AC Output Frequency**—The UPS output frequency
- **AC Output Power (kVA)**—The UPS output power
- **AC Output Load level (%)**—The percentage of load at the UPS output
- **Battery Capacity (%)**—The percentage of battery charge available
- **Battery Remaining time (min)**—The estimated remaining backup time

NOTE: When the log reaches the maximum of 340 entries, new entries overwrite the oldest entries in the log.

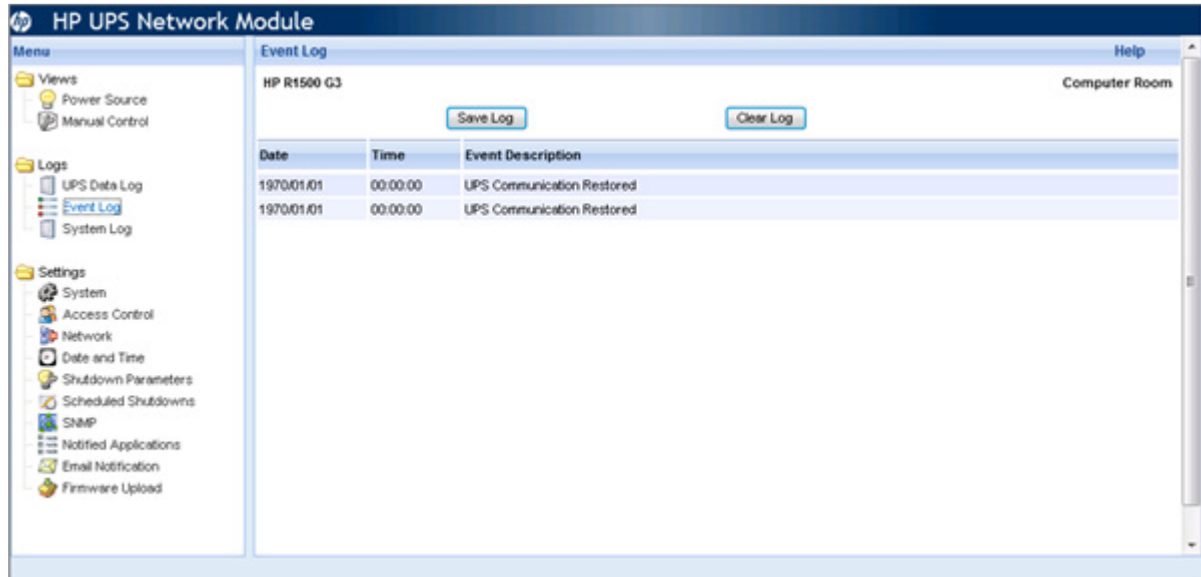
On the screen:

- Click **Save Log** to download the log file (.csv) to your computer.
- Click **Clear Log** to clear the log files. Only users with administrator privileges can clear logs.
- Click **Help** to view online help.

Event Log screen

Click **Event Log** in the menu tree to display the Event Log screen. This screen displays a log of the events that have occurred on the UPS, such as the UPS switching to battery power.

NOTE: In the UPS Data Log and the Event Log, the date and time stamps are converted to the local time zone.



The following information is displayed for each event:

- **Date**—The date at which the event occurred
- **Time**—The time at which the event occurred
- **Event Description**—A description of the event

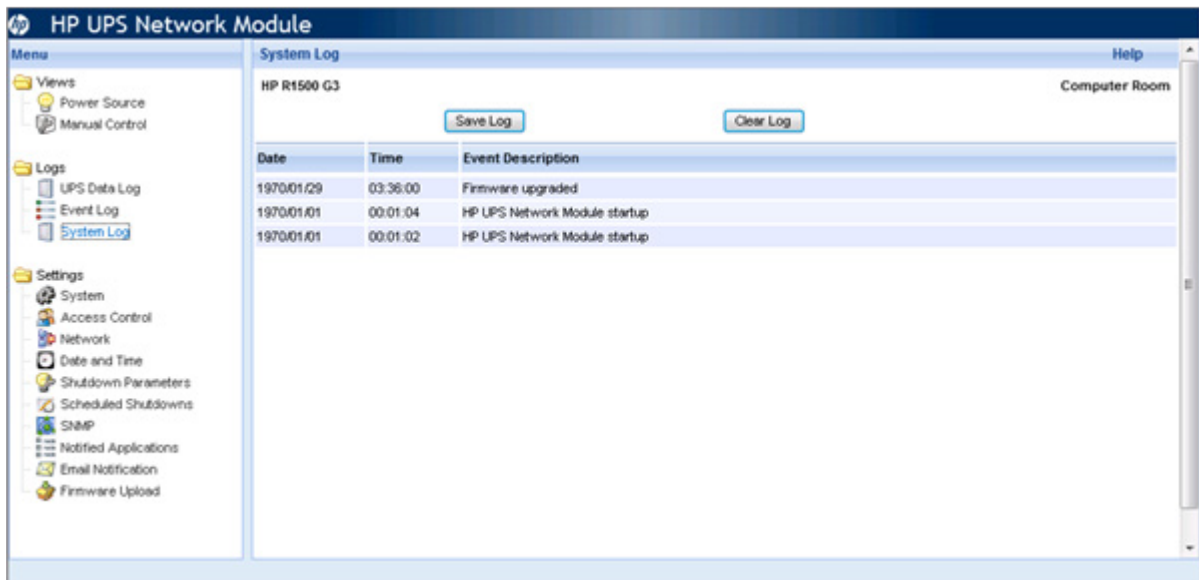
NOTE: When the log reaches the maximum of 435 entries, new entries overwrite the oldest entries in the log.

On the screen:

- Click **Save Log** to download the log file (.csv) to your computer.
- Click **Clear Log** to clear the log files. Only users with administrator privileges can clear logs.
- Click **Help** to view online help.

System Log screen

Click **System Log** in the menu tree to display the System Log screen. This screen displays a log of the events that have occurred on the UPS Network Module, such as a communication failure or system shutdown.



The following information is displayed for each event:

- **Date**—The date at which the event occurred
- **Time**—The time at which the event occurred
- **Event Description**—A description of the event

NOTE: When the log reaches the maximum of 435 entries, new entries overwrite the oldest entries in the log.

On the screen:

- Click **Save Log** to download the log file (.csv) to your computer.
- Click **Clear Log** to clear the log files. Only users with administrator privileges can clear logs.
- Click **Help** to view online help.

Settings

Menu options listed under Settings include:

- System Settings ("System Settings screen" on page 30)
- Access Control ("Access Control screen" on page 31)
- Network Settings ("Network Settings screen" on page 32)
- Time Settings ("Time Settings screen" on page 34)
- Shutdown Parameters ("Shutdown Parameters screen" on page 35)
- Scheduled Shutdown ("Scheduled Shutdown screen" on page 40)
- SNMP Settings ("SNMP Settings screen" on page 41)
- Notified Applications ("Notified Applications screen" on page 43)

- Email Notification ("[Email Notification screen](#)" on page 45)
- Firmware Upload ("[Firmware Upload screen](#)" on page 48)

System Settings screen

Click **System** in the menu tree to display the System Settings screen. This screen allows an administrator to enter contact information, reset communication, and restore factory default settings on the UPS Network Module.

The screenshot displays the 'HP UPS Network Module' web interface. On the left is a 'Menu' tree with categories: Views (Power Source, Manual Control), Logs (UPS Data Log, Event Log, System Log), and Settings (System, Access Control, Network, Date and Time, Shutdown Parameters, Scheduled Shutdowns, SNMP, Notified Applications, Email Notification, Firmware Upload). The 'System' setting is selected. The main panel, titled 'System Settings', shows the device as 'HP R1500 G3' with a 'Computer Room' label. It contains several configuration fields: 'UPS Contact' (Computer Room Manager), 'UPS Location' (Computer Room), 'UPS System Name' (UPS), 'Default Language' (Auto), and 'History log interval (sec)' (60). At the bottom, there is a 'Save modified settings' section with a 'Save' button, a 'Reset Communication' button, a 'Factory Reset' button, and a checked checkbox for 'Keep TCP/IP parameters'. A 'Help' link is visible in the top right corner.

To enter the system information:

1. Enter the name of the person responsible for UPS administration in the UPS Contact field. This text field is limited to 49 characters.
2. Enter a description of the physical location of the UPS in the UPS Location field. This text field is limited to 31 characters. The UPS Location displays throughout the interface.
3. Enter a custom name for the UPS in the System Name field. This name appears throughout the interface and is included in SNMP traps. Use a unique name for each UPS.
4. Select the display language of the web interface in the Default Language pull-down menu. Available options are English, Japanese, or Auto. Select Auto to allow the interface to display the language configured for the web browser. Refresh the browser window for changes to take effect.
5. Enter the time interval for UPS data collection in the History log interval (sec) field. The interval can be between 5 and 99999 seconds. By default, UPS data is collected every 60 seconds.
6. Click **Save**.

To perform a remote reboot of the UPS Network Module without modifying the configuration, click **Reset Communication**. This action is required to enable any changes made on the Network Settings screen (on page 32).

To restore all UPS Network Module parameters to the default configuration, click **Factory Reset**. The UPS Network Module communication will be lost. To maintain communication, select the **Keep TCP/IP parameters** checkbox, and then click **Factory Reset**. The configured IP address, subnet mask, gateway, and BOOTP/DHCP parameters are not reset.

Click **Help** to view online help.

For a summary of the default configuration, see "Default parameters (on page 76)."

Access Control screen

Click Access Control in the menu tree to display the **Access Control** screen. This screen allows three administrator accounts to configure secure access to the UPS Network Module through a web browser. Enter the first administrator account login username and password in **HPPP Clients > Device Discovery > Configure Power Source to access HP UPS Network Module**. The second and third accounts can be enabled or disabled by the administrator.

The screenshot shows the 'HP UPS Network Module' web interface. The left sidebar contains a 'Menu' tree with categories: Views (Power Source, Manual Control), Logs (UPS Data Log, Event Log, System Log), and Settings (System, Access Control, Network, Date and Time, Shutdown Parameters, Scheduled Shutdowns, SNMP, Notified Applications, Email Notification, Firmware Upload). The 'Access Control' page is active, showing the title 'HP R1500 G3' and 'Computer Room'. It lists three administrators. Administrator 1 is active and has fields for 'Enter New Manager Login' (admin), 'Enter New Password' (*****), and 'Confirm New Password' (*****). Administrators 2 and 3 are disabled (checkboxes are unchecked) and have empty fields. Below the administrators is the 'Security mode' section with three radio buttons: 'Authentication for configuration' (selected), 'Full authentication', and 'SSL and full authentication'. At the bottom, there is a 'Save modified settings' label and a 'Save' button.

To configure the administrator account that provides secure access and enables modification of configuration settings and log files:

1. Enter a new user name in the Enter New Manager Login field, and then enter a new password in the Enter New Password field.
Each field requires a minimum of five characters and is limited to a maximum of 31 characters. The default user name and password for the first administrator account is `admin`.
2. Re-enter the new password in the Confirm New Password field.
3. Select the authentication method for the security mode.
 - o **Authentication for configuration**—Configuration screens are protected by a user name and password.
 - o **Full authentication**—All pages are protected by a user name and password.
 - o **SSL and full authentication**—All pages are protected by a user name and password, and are only accessible in SSL. Access to the web interface occurs through HTTPS. The connections to the UPS Network Module remain in standard mode (secure TCP).
4. Click **Save**.

Click **Help** to view online help.

Network Settings screen

Click **Network** in the menu tree to display the Network Settings screen. This screen allows an administrator to configure network settings and authorize remote firmware upgrades for the UPS Network Module.

The screenshot displays the 'HP UPS Network Module' web interface. On the left is a 'Menu' tree with categories: Views (Power Source, Manual Control), Logs (UPS Data Log, Event Log, System Log), and Settings (System, Access Control, Network, Date and Time, Shutdown Parameters, Scheduled Shutdowns, SNMP, Notified Applications, Email Notification, Firmware Upload). The 'Network' option under Settings is selected. The main panel is titled 'Network Settings' and shows configuration for 'HP R1500 G3' in the 'Computer Room'. The settings include: BootP/DHCP (Disabled), IP address (16.83.130.236), Subnet Mask (255.255.254.0), Gateway Address (16.83.130.1), Hostname (R1500G3-1), Domain Name (ups.domain.com), IPv6 Enabled (unchecked), IPv6 Auto Config Enabled (unchecked), IPv6 Address 1, Prefix length, IPv6 Gateway, IPv6 Local Address, IPv6 Address 2, Firmware Upload (Enabled), Primary DNS Server (172.25.234.2), Secondary DNS Server (0.0.0.0), SMTP Server (smtpserver), SMTP server authentication (unchecked), Login (smtplogin), Password (masked), and a 'Save modified settings' button.

To configure the network settings:

1. Select **Enabled** from the BootP/DHCP pull-down menu to allow configuration of network parameters by a BootP or DHCP server. After each restart, the UPS Network Module makes five attempts to recover the network parameters. If a response is not received from the server, the UPS Network Module boots with the last saved parameters from the most recent start.
2. If your network is not configured with a BootP or DHCP server, select **Disabled** from the BootP/DHCP pull-down menu, and then enter the network settings:
 - a. Enter the IP address of the UPS Network Module in the IP Address field. The UPS Network Module must have a unique IP address for use on a TCP/IP network.
 - b. Enter the subnet mask of the UPS Network Module in the Subnet Mask field to identify the class of the sub-network to which the UPS Network Module is connected.
 - c. Enter the gateway address of the UPS Network Module in the Gateway Address field to allow connection to devices or hosts attached to different network segments.
 - d. Enter the host name of the UPS Network Module in the Hostname field. The host name is the first part of the fully qualified domain name used by the DNS. The host name is sent to the DNS only if the DHCP server sends the host name with the new IP address. The default value of the two parameters comprising the fully qualified domain name is ups.domain.com.
 - e. Enter the name of the domain to which the UPS Network Module belongs in the Domain Name field. The domain name is the part of the fully qualified domain name that follows the host name

and is used by the DNS. The default value of the two parameters comprising the fully qualified domain name is `ups.domain.com`.

3. Select or clear the **IPv6 Enabled** checkbox to enable or disable IPv6, respectively. The local IP address of the UPS Network Module is built from the MAC address and appears in the IPv6 Local Address field when IPv6 is enabled.
4. If IPv6 is enabled, select the **IPv6 Auto Config Enabled** checkbox to have the IPv6 router build the IPv6 Address 1, Prefix length, and IPv6 Address 2. The IPv6 Gateway field is empty and cannot be edited.

-or-

Clear the IPv6 Auto Config Enabled checkbox and enter the following settings:

- IPv6 Address 1—Set a static IPv6 address.
 - Prefix length—Set a prefix for the IPv6 Address 1.
 - IPv6 Gateway—Set the default gateway.
5. Select **Enabled** from the Firmware Upload to allow remote upgrade of the UPS Network Module firmware through the network. If this option is disabled, remote firmware upgrade is not allowed.
 6. Enter the IP address of the DNS server that normally provides the translation of the domain name to IP address in the Primary DNS Server field.
 7. Enter the IP address of the secondary DNS server that provides the translation of the domain name to IP address when the primary DNS server is not available in the Secondary DNS Server field.
 8. Enter the host name or IP address of the SMTP server used to transfer email messages in the SMTP Server field.
 9. Select the SMTP server authentication checkbox to require a user name and a password for SNMP authentication. Enter the user name in the Login field, and then enter the password in the Password field.

NOTE: The UPS Network Module will not send email notifications until the recipients are configured on the Email Notification screen (on page [45](#)).

10. Click **Save**.
11. For your changes to take effect, be sure to reboot the UPS Network Module by clicking **Reset Communication** on the System Settings screen (on page [30](#)).

Click **Help** to view online help.

Time Settings screen

Click **Date and Time** in the menu tree to display the **Time Settings** screen. This screen allows an administrator to set the UPS Network Module date and time.

The screenshot shows the 'HP UPS Network Module' web interface. On the left is a 'Menu' tree with categories: Views (Power Source, Manual Control), Logs (UPS Data Log, Event Log, System Log), and Settings (System, Access Control, Network, Date and Time, Shutdown Parameters, Scheduled Shutdowns, SNMP, Notified Applications, Email Notification, Firmware Upload). The 'Date and Time' option under Settings is selected. The main panel is titled 'Time Settings' and shows 'HP R1500 G3' and 'Computer Room'. It displays 'Current date and time' as 1970/01/02 04:12:00. Under 'Setting time', the 'Set manually' radio button is selected. Fields for Date (1970/01/02) and Time (04:12:00) are present. Other options include 'Accept automatic update from HP Power Protector' (unselected), 'Synchronize with NTP server' (unselected), and 'Daylight saving time' set to 'Disable'. NTP server details show Hostname: ntpserver and Time-Zone: (GMT) Casablanca, Greenwich Mean TIME: Dublin, Lisbon, London. Start and End times for daylight saving are both set to First Sunday of January at 00:00. A 'Save' button is at the bottom.

The current date and time appears at the top of the screen.

To manually enter the date and time:

1. Select the **Set manually** radio button.
2. Enter the date (yyyy/mm/dd) in the Date field.
3. Enter the time (hh:mm:ss) in the Time field.
4. Click **Save**.

After the system reboots, it needs to sync with the UPS date and time on UPSs with real time clock. Otherwise the default date is set to 1970/01/01 and the default time is set to 00:00:00. To avoid this, select either the **Accept Automatic Update from HP Power Protector** radio button (default setting) or the **Synchronize with NTP Server** radio button.

To synchronize the date and time with the HPEPP Client:

NOTE: Verify that the HPEPP Client is configured with the correct date and time, because the UPS Network Module uses the time from the first Client that responds.

1. Select the **Accept automatic update from HP Power Protector** radio button.
2. Click **Save**.

To synchronize the date time with an NTP server:

1. Select the **Synchronize with NTP server** radio button. If no NTP server is discovered, the date is set to 1970/01/01 and the time is set to 00:00:00.
2. Enter the IP address or host name of the NTP server in the Hostname field.
3. Select the time zone for your geographic area from the Time-Zone pull-down menu.

4. Select the **Disable** radio button if daylight saving time should not be reflected in the time on the UPS Network Module.

-or-

Select the **Enable** radio button to configure time adjustment for daylight saving time:

- a. Select the week number, day, month, and time for which daylight saving time should start. For example, if daylight saving time starts the second Sunday of March at 2:00 am, select **Second, Sunday, and March**, and then enter 02:00.
 - b. Select the week number, day, month, and time for which daylight saving time should end. For example, if daylight saving time ends the first Sunday of November at 3:00 am, select **First, Sunday, and November**, and then enter 03:00.
 - c. Select the amount of time the clock should change for daylight saving time in your region. Available options are 30 minutes and 1 hour.
5. Click **Save** to connect to the NTP server and set the date and time.

The UPS Network Module uses the NTP protocol (UDP 123 port). The firewall must be set to transmit queries outside the network. No error message is generated if connection with the NTP server fails. The UPS Network Module attempts to connect to the NTP server every 10 seconds until a connection is made.

Click **Help** to view online help.

Shutdown Parameters screen

Click **Shutdown Parameters** in the menu tree to display the Shutdown Parameters screen.

This screen allows an administrator to configure how the UPS Network Module should shut down and restart the UPS and attached devices in the event of a power failure.

The Shutdown Parameters table contains a row for the entire UPS/master outlets and a row for each load segment. Settings for the entire UPS/master outlets apply to all load segments. Settings for individual load segments only apply to that load segment.

UPS models other than G4

HP UPS Network Module

Menu: Views (Power Source, Manual Control), Logs (UPS Data Log, Event Log, System Log), Settings (System, Access Control, Network, Date and Time, **Shutdown Parameters**, Scheduled Shutdowns, SNMP, Notified Applications, Email Notification, Firmware Upload)

Shutdown Parameters

HP R1500 G3 Computer Room

Output	On battery	OS Shutdown	Restart
Entire UPS	Shutdown initiated if Remaining Backup time under: 0 sec		
Load Segment 1	Shutdown initiated after: 180 sec if Battery Capacity under: 5 %	OS Shutdown Time: 120 sec	Switch On after the restart: 0 sec
Load Segment 2	Shutdown initiated after: 180 sec if Battery Capacity under: 5 %	OS Shutdown Time: 120 sec	Switch On after the restart: 1 sec

Save modified settings:

G4 UPS

HP UPS Network Module

Menu: Views (Power Source, Manual Control), Logs (UPS Data Log, Event Log, System Log), Settings (System, Access Control, Network, Date and Time, **Shutdown Parameters**, Scheduled Shutdowns, SNMP, Notified Applications, Email Notification, Firmware Upload)

Shutdown Parameters Help

HP R1500 NA UPS Computer Room

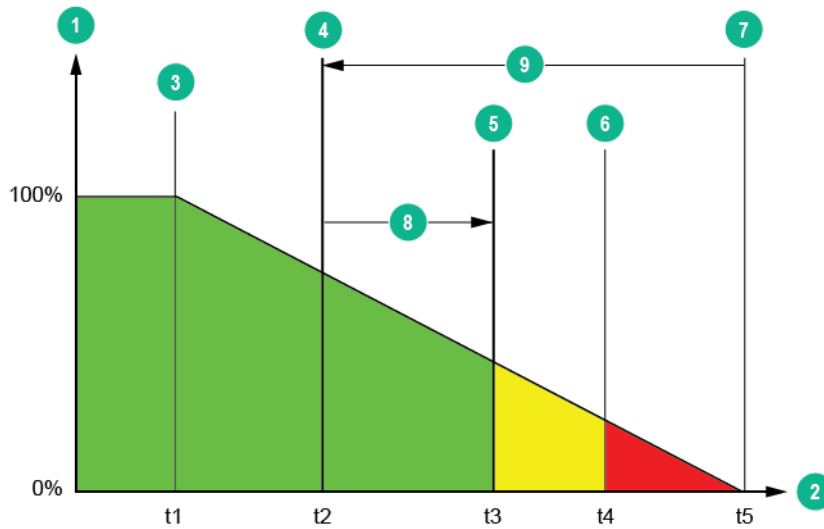
Output	On battery	OS Shutdown	Restart
Master	Shutdown initiated if Remaining Backup time under: 180 sec if Battery Capacity under: 20 % after: 300 sec	OS Shutdown Time: 120 sec	Restart if Battery Capacity exceeds: 0 %
Load Segment 1	Shutdown initiated after: 300 sec if Battery Capacity under: 20 %	OS Shutdown Time: 120 sec	Switch On after the restart: 30 sec
Load Segment 2	Shutdown initiated after: 300 sec if Battery Capacity under: 20 %	OS Shutdown Time: 120 sec	Switch On after the restart: 30 sec

Save modified settings :

To configure the shutdown parameters:

1. Configure shut down and restart:
 - a. Enter the On Battery values. When a utility power failure occurs, the UPS automatically switches to battery power. One or all of the values in this column are set to allow protected servers to be powered by a UPS operating on battery power. In the event of a utility power failure, all On Battery settings are evaluated, and the first trigger that is reached initiates the shutdown sequence.

- i. In the Shutdown initiated if remaining backup time under field (entire UPS/master outlets), enter the minimum amount of battery life that can remain before the UPS shutdown sequence starts (0 to 43200 seconds, 180 seconds by default). The UPS Network Module initiates a UPS shutdown when the remaining battery life reaches the specified time.

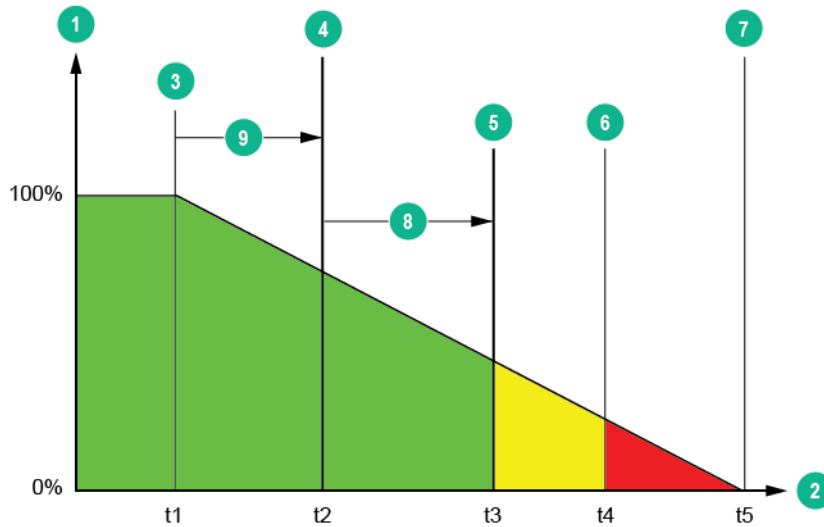


Item	Description
1	Battery capacity
2	Time
3	Utility failure
4	Shutdown initiated
5	Load segment powered down
6	Low battery
7	Battery depleted
8	Operating system shutdown time
9	Remaining backup time under

- ii. In the Shutdown initiated after field (individual load segments), enter the number of seconds after the power fails that the UPS Network Module should wait before starting to shut down the load segment (0 to 43200 seconds, 300 seconds by default). Enter a shorter delay for load segments that power less critical equipment to preserve UPS battery power for other load segments. The value you enter is continually compared with the maximum Shutdown initiated after shutdown time of all subscribed HPEPP Clients. The highest value is automatically used.

If the Shutdown initiated after (sec) field is set to none, UPS devices power down as late as possible without performing a graceful shutdown.

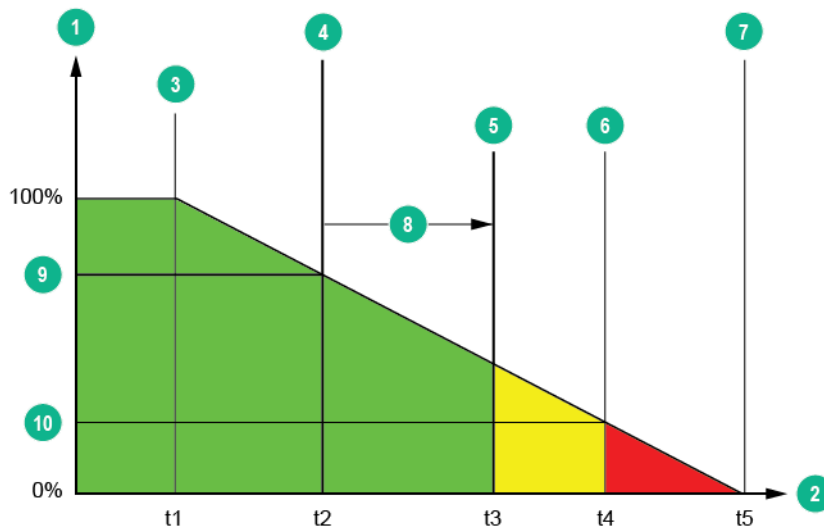
Upon reset, the value defaults to the maximum value.



Item	Description
1	Battery capacity
2	Time
3	Utility failure
4	Shutdown initiated
5	Load segment powered down
6	Low battery
7	Battery depleted
8	Operating system shutdown time
9	Shutdown initiated after time

- iii. In the Shutdown initiated if battery capacity under field (individual load segments), enter the minimum amount of battery life that can remain before the load segment shutdown sequence starts (0 to 100%, 20% by default). The UPS Network Module initiates a load segment shutdown when the remaining battery life reaches the specified percentage.

The Shutdown initiated if battery capacity under parameter can initiate the shutdown sequence before the shutdown delay expires.



Item	Description
1	Battery capacity
2	Time
3	Utility failure
4	Shutdown initiated
5	Load segment powered down
6	Low battery
7	Battery depleted
8	Operating system shutdown time
9	Shutdown initiated after time
10	Low battery alarm triggered by UPS

- b. Enter the OS Shutdown value for protected servers connected to the individual load segments (120 to 9999 seconds, 120 seconds by default). This is the number of seconds required to completely shut down protected servers, including running shutdown scripts, shutting down the operating systems, and powering down the servers. The value you enter is continually compared with the maximum OS shutdown time of all subscribed HPEPP Clients. The highest OS Shutdown value is automatically used.

When one of the On Battery triggers is reached, the shutdown sequence starts for that load segment or for the entire UPS/master outlets. When the OS Shutdown timer is started, the shutdown cannot be reversed, even if utility power is restored.

- c. Enter the Restart values. When utility power is restored, all Restart settings are evaluated, and the first trigger that is reached initiates the restart sequence.

Values set for the master outlet (in G4 UPS) override the values set for LS1 and LS2. In order to make sure the master outlet is the last to shut down, set parameter values appropriately (higher or lower in comparison with load segment settings). When the master outlet shuts down, the entire UPS shuts down as well.



IMPORTANT: Carefully plan the restart settings configuration. You might experience an additional delay before servers power up, even though utility power is restored.

- i. In the Restart if battery capacity exceeds field (entire UPS/master outlets), enter the percentage of battery charge that must be available before restarting the UPS after AC power is restored (0 to 100%, 0% by default).
- ii. In the Switch on after the restart (individual load segments), enter the number of seconds after the UPS restarts that the UPS Network Module should wait before restarting the load segment (from 0 to 32000 seconds, 30 seconds by default). This option allows utility power to stabilize and disks in shared storage configurations to spin up before the server restarts.

2. Click **Save**.

For more information about shutdown parameters, see "Shutdown parameters (on page 55)."

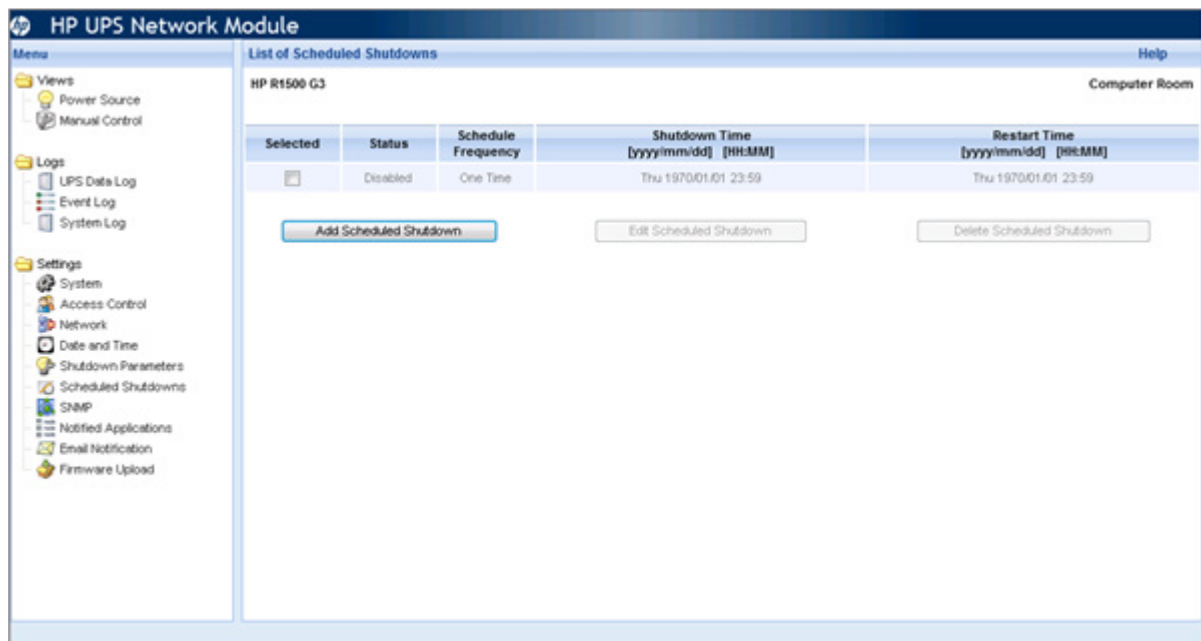
Click **Help** to view online help.

Scheduled Shutdown screen

For a valid schedule, be sure the time is set correctly on the Time Settings screen (on page 34).

While configuring scheduled shutdowns, be sure to adhere to the following rules:

- The Restart Date/Time must be after the Shutdown Date/Time. If an Every Day shutdown frequency is selected, the Restart Date/Time can be the day after the Shutdown Date/Time, but must be before the next scheduled shutdown.
- When scheduling Daily and Weekly shutdown times, verify that the Shutdown Date/Time or the Restart Date/Time do not overlap.



To configure scheduled shutdowns:

1. Click **Scheduled Shutdowns**. The List of Scheduled Shutdowns screen appears.
2. Do one of the following:
 - o Click **Add Scheduled Shutdowns** to add a new scheduled shutdown. The Add a New Scheduled Shutdown screen appears.
 - o In the Selected column, select a scheduled shutdown that you want to configure, and then click **Edit Scheduled Shutdown**. The Edit an Existing Scheduled Shutdown Settings screen appears.
 - o In the Selected column, select a scheduled shutdown that you want to remove, and then click **Delete Scheduled Shutdown**.

3. In the Status field, select Enabled to activate the scheduled shutdown or select Disabled to disable the scheduled shutdown.
4. In the Schedule Frequency field, select One Time, Every Day, or Every Week to set the occurrence of the scheduled shutdown.
5. In the Shutdown (Date/Time) field:
 - a. Enter a date for the scheduled shutdown to begin in the format `yyyy/mm/dd` or choose a date from the calendar.
 - b. Select the hour for the scheduled shutdown to begin.
 - c. Select the minute for the scheduled shutdown to begin.
6. In the Restart (Date/Time) field:
 - a. Enter a date for the scheduled restart in the format `yyyy/mm/dd` or choose a date from the calendar.
 - b. Select the hour for the scheduled shutdown to restart.
 - c. Select the minute for the scheduled shutdown to restart.
7. Click **Save**. A warning message appears if scheduled shutdowns conflict, or if there is more than seven days between shutdown and restart of an Every Week periodicity.

Click **Cancel** to go back to the previous screen.

Click **Help** to view online help.

SNMP Settings screen

Click **SNMP** in the menu tree to display the SNMP Settings screen. This screen allows an administrator to configure SNMP settings for computers that use the HPE Power MIB to request information from the UPS Network Module.

The screenshot displays the 'HP UPS Network Module' interface. On the left is a 'Menu' tree with sections: Views (Power Source, Manual Control), Logs (UPS Data Log, Event Log, System Log), and Settings (System, Access Control, Network, Date and Time, Shutdown Parameters, Scheduled Shutdowns, **SNMP**, Notified Applications, Email Notification, Firmware Upload). The main panel is titled 'SNMP Settings' and includes a 'Help' link. It shows configuration for 'HP R1500 G3' in the 'Computer Room'. The 'SNMP Version' is set to 'V1&V3'. Under 'SNMP V1 Setting', 'Community Read-Only' is 'public', 'SNMP Write' is 'Enabled', and 'Community Write' is 'private'. Under 'SNMP V3 Setting', 'Read-Only User' is 'readuser', 'Read-Only Security Level' is 'Auth No Priv', 'Read-Only Password' is masked, 'Read-Write User' is 'writewriter', 'Read-Write Security Level' is 'Auth Priv', 'Read-Write Password' is masked, and 'Notification Username' is 'notifuser'. A 'Save modified settings' section with a 'Save' button is at the bottom.

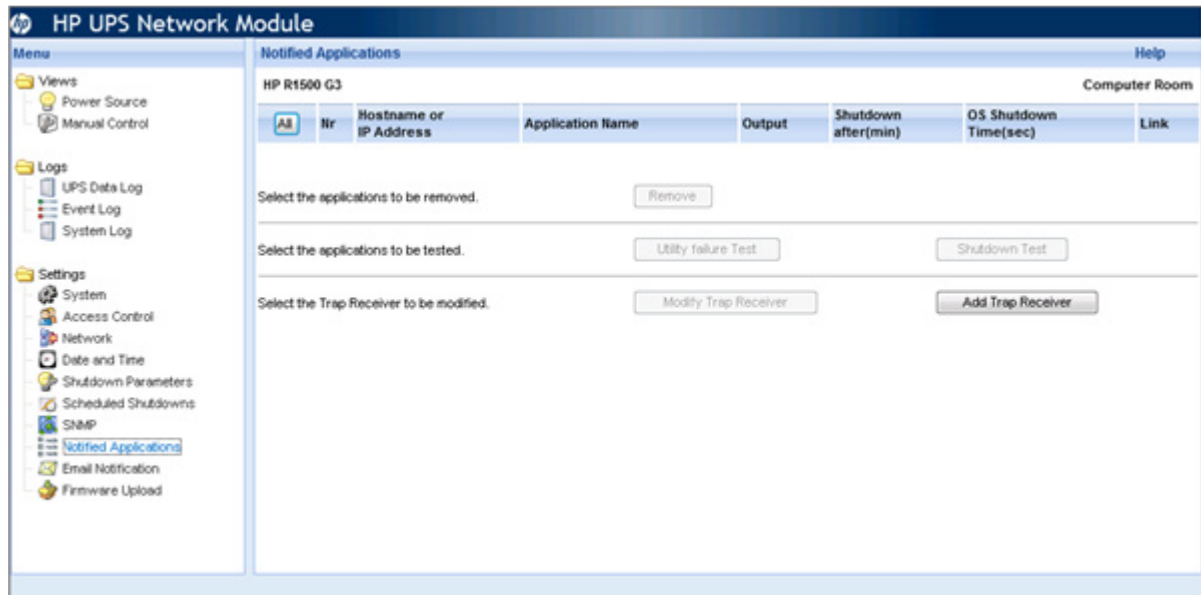
To configure the SNMP settings:

1. Select the SNMP version supported by the UPS Network Module from the Version pull-down menu. Available options are Disabled, V1, V3, and V1 and V3.
2. Configure the SNMP V1 settings:

- a. Enter the SNMP Community Read-Only string. The UPS Network Module and the Clients must share the same community name to communicate.
 - b. Select or clear the SNMP Write Enabled checkbox to enable or disable the SNMP write function.
 - c. If the SNMP write function is enabled, enter the SNMP Community Write string. The UPS Network Module and the Clients must share the same community name to communicate.
 3. Configure the SNMP V3 settings:
 - a. Enter a user name for the Read-Only User. This user is only authorized to read SNMP variables.
 - b. Select a level of security from the Read-Only Security Level pull-down menu:
 - **No Auth No Priv**—The user does not use authentication and privacy to access SNMP variables.
 - **Auth No Priv**—The user must use authentication, but not privacy, to access SNMP variables.
 - **Auth Priv**—The user must use authentication and privacy to access SNMP variables.
 - c. Enter the Read-Only Password to specify a new password for the Read-Only User. The password can be between 8 and 24 alphanumeric characters and the <>&@#%_=:;,./?|\$(*) symbols.
 - d. Enter a user name for the Read-Write User. This user is authorized to read and write SNMP variables.
 - e. Select a level of security from the Read-Write Security Level pull-down menu:
 - **No Auth No Priv**—The user does not use authentication and privacy to access SNMP variables.
 - **Auth No Priv**—The user must use authentication, but not privacy, to access SNMP variables.
 - **Auth Priv**—The user must use authentication and privacy to access SNMP variables.
 - f. Enter the Read-Write Password to specify a new password for the Read-Write User. The password can be between 8 and 24 alphanumeric characters and the <>&@#%_=:;,./?|\$(*) symbols.
 - g. Enter a user name to include in SNMPV3 notification in the Notification Username field. This field must also be defined in the applications that receive the notifications. The user name can be between 8 and 24 alphanumeric characters and the <>&@#%_=:;,./?|\$(*) symbols.
 4. Click **Save**.
- Click **Help** to view online help.

Notified Applications screen

Click **Notified Applications** in the menu tree to display the Notified Applications screen. This screen allows an administrator to manage trap receivers and HPEPP Clients installed on protected servers. You can add trap receivers using this screen, but all HPEPP Clients are configured at the servers, and are automatically added by the UPS Network Module.



NOTE: To query SNMP data, you do not need to add SNMP Manager.

The following information is available on the Notified Applications screen:

- **Nr**—The assigned application number in the Notified Applications list
- **Hostname or IP Address**—The host name or IP address of the server running the application
The host name of the computer displays when the IP address can be converted into a host name by a DNS server, or if the application has been entered using the server host name.
- **Application Name**—The name assigned to the application on the Trap Receivers Settings screen (on page 44)
Applications appear in the order in which they subscribe to the UPS Network Module. SNMP management applications, such as HPE Systems Insight Manager, can receive notifications from the UPS Network Module.
- **Output**—The name of the UPS load segment from which the Client is powered
- **Shutdown after (min)**—The time available to the user after a utility power failure occurs and before the UPS shutdown sequence initiates
This value is configured in the HPEPP Client and displays in this column.
- **OS Shutdown time (sec)**—The time required to completely shut down the operating system
This value is configured in the HPEPP Client and displays in this column.
- **Link**—A hyperlinked icon to the web interface for the notified application
- (HTTP Connection, HTTPS Connection, or Communication Loss)

To add a trap receiver:

1. Click **Add Trap Receiver**.

2. Configure the settings for the new application on the Trap Receivers Settings screen (on page 44).

To modify a trap receiver:

1. Select the checkbox for the application you want to modify. To select all applications, click **All**.
2. Click **Modify Trap Receiver**.
3. Modify the settings for the application on the Trap Receivers Settings screen (on page 44).

To remove a trap receiver:

1. Select the checkbox for the application you want to remove. To select all applications, click **All**.
2. Click **Remove**.

To simulate a utility power failure:

1. Select the checkbox for the application you want to test. To select all applications, click **All**.
2. Click **Utility Failure Test**. The UPS Network Module sends a Utility failure trap, and then sends a Utility restored trap 30 seconds later.
3. Verify that the selected application received the traps over the network.

To simulate a UPS On Battery condition:

1. Select the checkbox for the application you want to test. To select all applications, click **All**.
2. Click **Shutdown Test**.
3. The selected application processes the simultaneous alarms and performs an actual shutdown sequence.



CAUTION: The Shutdown Test generates an actual shutdown sequence for the server on which the application is running.

4. Verify that the server protection is working correctly.

Click **Help** to view online help.

Trap Receivers Settings screen

Click **Add Trap Receiver** on the Notified Applications screen to display the Trap Receivers Settings screen. This screen allows an administrator to configure management applications to receive SNMP traps from the UPS Network Module. SNMP management applications, such as HPE Systems Insight Manager, can receive notifications from the UPS Network Module.

Up to three applications can be configured to receive SNMP traps from the UPS Network Module. To configure an application to receive SNMP traps:

1. Enter the name of the application in the Application Name field. Hewlett Packard Enterprise recommends adding “SNMP” or “Trap” to the name to for easy monitoring.
2. Enter the host name or the IP address of the management server on which the application is running in the Hostname or IP address field.
3. Select the SNMP version from the Protocol pull-down menu.
4. If you selected SNMP V1, enter the community string in the Trap Community field.
5. Select the checkbox for the appropriate MIB:
 - **HP MIB (cpqpower.mib)**—The HPE Power MIB
 - **IETF MIB (RFC1628)**—A standard UPS MIB
6. Click **Save**. The application information appears on the Notified Applications screen (on page 43).

Click **Help** to view online help.

Email Notification screen

Click **Email Notification** in the menu tree to display the Email Notification screen. This screen allows an administrator to configure recipients of email notifications from the UPS Network Module. Before email notifications can be sent, the SMTP server must be configured on the Network Settings screen (on page 32).

The email messages sent by the UPS Network Module are compatible with mobile transfer telephone systems using the SMS standard for text messaging. The required format might vary, depending on the cellular service provider. Contact your cellular service provider for mail to SMS gateway settings.

The screenshot displays the 'Email Notification' configuration page for an HP R1500 G3 UPS. The left sidebar contains a 'Menu' with categories: Views (Power Source, Manual Control), Logs (UPS Data Log, Event Log, System Log), and Settings (System, Access Control, Network, Date and Time, Shutdown Parameters, Scheduled Shutdowns, SNMP, Notified Applications, Email Notification, Firmware Upload). The main content area is titled 'Email Notification' and includes a 'Help' link. It features a 'Recipient list' with four email addresses: recipient1@domain.com, recipient2@domain.com, recipient3@domain.com, and recipient4@domain.com. Below the list is a 'Save' button. The 'Recipient' field is set to 'recipient1@domain.com' with a 'Disabled' status. The 'Attached files' section has checkboxes for 'Measurements', 'Event Log', and 'System Log'. The 'Periodic report' section shows 'Every 0 day(s) at 00:00' with a 'Test' button. On the right, there are two sections: 'Notified events for the selected Recipient' and 'Software alarms'. The 'Notified events' section includes 'Battery operation' (UPS on battery, UPS on normal AC, UPS Off sequence in progress, Low battery) and 'UPS alarms' (Battery fault, Battery OK, UPS overload, UPS returns to normal load, UPS fault, UPS OK, UPS communication failed, UPS communication restored, Charger fault, Output on by-pass, Return from by-pass). The 'Software alarms' section includes 'Firmware upgrade'. A 'Set Default' button is at the bottom right.

Up to four recipients can be configured to receive email notifications from the UPS Network Module. To configure a recipient of email notifications:

1. Enter the email address of the recipient in the Recipient field.

2. Select the appropriate checkboxes to add log file attachments to the email notifications for the recipient. The selected log files are included in .csv format.
3. To send periodic email reports with log file attachments to the recipient:
 - a. Enter the interval in days between email report transmissions.
 - b. Select the time of the day when email reports are generated and transmitted from the pull-down menu.
 - c. Select the date of the month the next email report should be generated and transmitted.
After this date, the screen indicates the date and time of the next transmission. Log files are included in .csv format.
4. Select the checkbox for each event that should trigger an email notification to the recipient. To save the notified event configuration to the default selections, click **Set Default**. The default selections are:
 - o UPS Off sequence in progress
 - o UPS alarms
5. Click **Save**.
6. Click **Test** to send a test email notification to the recipient.

To disable a recipient email address:

1. Select the address for the recipient you want to disable.
2. Select **Disabled** from the Recipient pull-down menu.
3. Click **Save**.

To configure the format of email notifications:

1. Click **Email Message Settings**.
2. Configure the email format for all recipients on the Email Message Settings screen (on page 47).

To configure the SMTP server:

1. Click **Network Settings**.
2. Configure the SMTP server settings on the Network Settings screen (on page 32).

Click **Help** to view online help.

Email Message Settings screen

Click **Email Message Settings** on the Email Notification screen to display the Email Message Settings screen. This screen allows an administrator to customize the format of email messages initiated by the UPS Network Module. The email message format applies to all recipients.

The screenshot displays the 'HP UPS Network Module' web interface. On the left is a 'Menu' sidebar with expandable sections: 'Views' (Power Source, Manual Control), 'Logs' (UPS Data Log, Event Log, System Log), and 'Settings' (System, Access Control, Network, Date and Time, Shutdown Parameters, Scheduled Shutdowns, SNMP, Notified Applications, Email Notification, Firmware Upload). The 'Email Message Settings' page is active, showing settings for 'HP R1500 G3' in the 'Computer Room'. A note states: 'These settings are common for all the recipients, which can be notified by E-mail.' The 'Sender' field contains 'ups@domain.com'. The 'Subject' field contains 'HP UPS Network Module - <Event message>'. Below the subject are three checkboxes: 'UPS Name' (unchecked), 'UPS Location' (unchecked), and 'Event message' (checked). The 'Message text' field is a large text area with the placeholder 'Type here your own text'. A 'Save' button is located at the bottom right of the form.

To customize email messages:

1. Enter the address for the source of email messages in the Sender field. The sender address can contain up to 59 characters. The default value is ups@domain.com. Depending on your SMTP server configuration, an existing domain might be required, with the user belonging to that domain.
2. Enter text you want to include in the email message subject lines in the Subject field. Select from the optional checkboxes to build the message subject:
 - **UPS name**—Includes the name of the UPS in the email subject when selected
 - **UPS location**—Includes the geographic location of the UPS in the email subject when selected
 - **Event message**—Identifies the event generating the message in the email subject when selected
3. Enter text you want to include in the email message body in the Message field: A maximum of 255 characters is allowed.

The body of the email message contains:

- Duplication of the subject, if configured.
- The date and time of the event, as saved in the log.
- A URL hyperlink to the UPS Network Module
- Attachments for the email recipient, as configured on the Email Notification screen (on page 45).
- The message text you entered in the Message field.

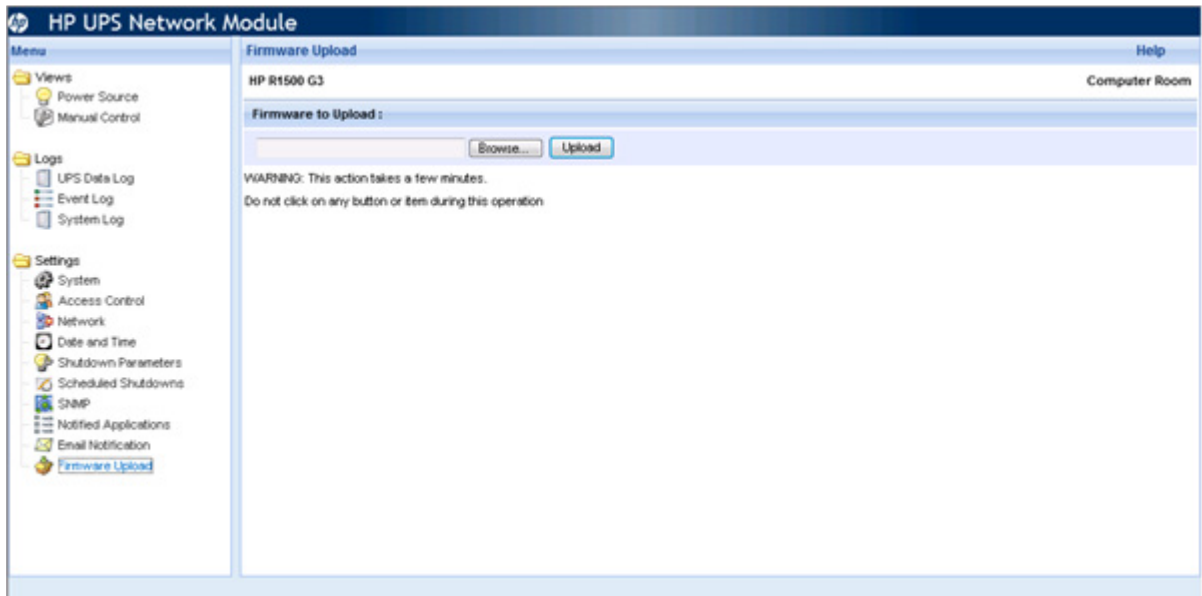
4. Click **Save**.

The email messages sent by the UPS Network Module are compatible with mobile transfer telephone systems using the SMS standard for text messaging. The required format might vary, depending on the cellular service provider. Contact your cellular service provider for mail to SMS gateway settings.

Click **Help** to view online help.

Firmware Upload screen

Click **Firmware Upload** in the menu tree to display the Firmware Upload screen. This screen allows an administrator to upgrade the UPS Network Module firmware.



During the upgrade process, the UPS Network Module does not monitor the UPS status. To upgrade the firmware:

1. Download the latest firmware version from the Hewlett Packard Enterprise website (<http://www.hpe.com/info/rackandpower>).
2. Click **Browse**.
3. Navigate to the folder where you saved the downloaded firmware.
4. Click **Upload**. The upload can take up to 5 minutes. Do not close the web browser or interrupt the operation. A confirmation message displays when the firmware upload successfully completes, and the UPS Network Module automatically restarts.

Click **Help** to view online help.

HPE UPS Network Module Configuration Menu

HPE UPS Network Module Configuration Menu overview

The HPE UPS Network Module Configuration Menu provides an alternative, limited interface to the UPS Network Module. System network values can be configured through the Configuration Menu and saved to the UPS Network Module.

NOTE: All parameters included in the UPS Network Module Configuration Menu can also be configured using the HPE UPS Network Module web interface.

Accessing the Service Menu

You can access the Configuration Menu locally by launching a terminal emulation program (on page 13).

On the terminal emulation session screen running on the host computer:

1. Press any key. The initialization process completes, and you are prompted to enter the password.
2. At the prompt, enter `admin`. The HPE UPS Network Module Configuration Menu appears.

Navigating the menus

After you have successfully initiated a terminal emulation session, the UPS Network Module Configuration Menu appears.

- Open a submenu by entering the corresponding option number at the prompt.
- To enter or change configuration information, follow the on-screen prompts.
- Enter 0 at the submenu prompt to go to the previous menu.
- -or-
Enter 0 at the Main menu prompt to exit the utility.
- Press the **Enter** key to refresh the screen.
- You must restart the UPS Network Module to allow configuration changes to take effect.

Main menu

This menu only appears when accessing the UPS Network Module using a terminal emulation program.

Option number	Submenu	Description
1	Reset	Resets the UPS Network Module
2	Network Configuration	Enables network configuration for the UPS Network Module
3	Set Login Password to Default	Restores the login password to the default password
4	Return to Default Configuration	Restores all settings to the default parameters (on page 76)

Option number	Submenu	Description
0	Exit	Exits the Configuration Menu

Reset submenu

Option number	Submenu	Description
1	Hardware Reset	Restarts the electrical power supply for the UPS Network Module
2	Restart Application	Restarts the UPS Network Module application
0	Exit	Returns to the previous menu

Network Configuration submenu

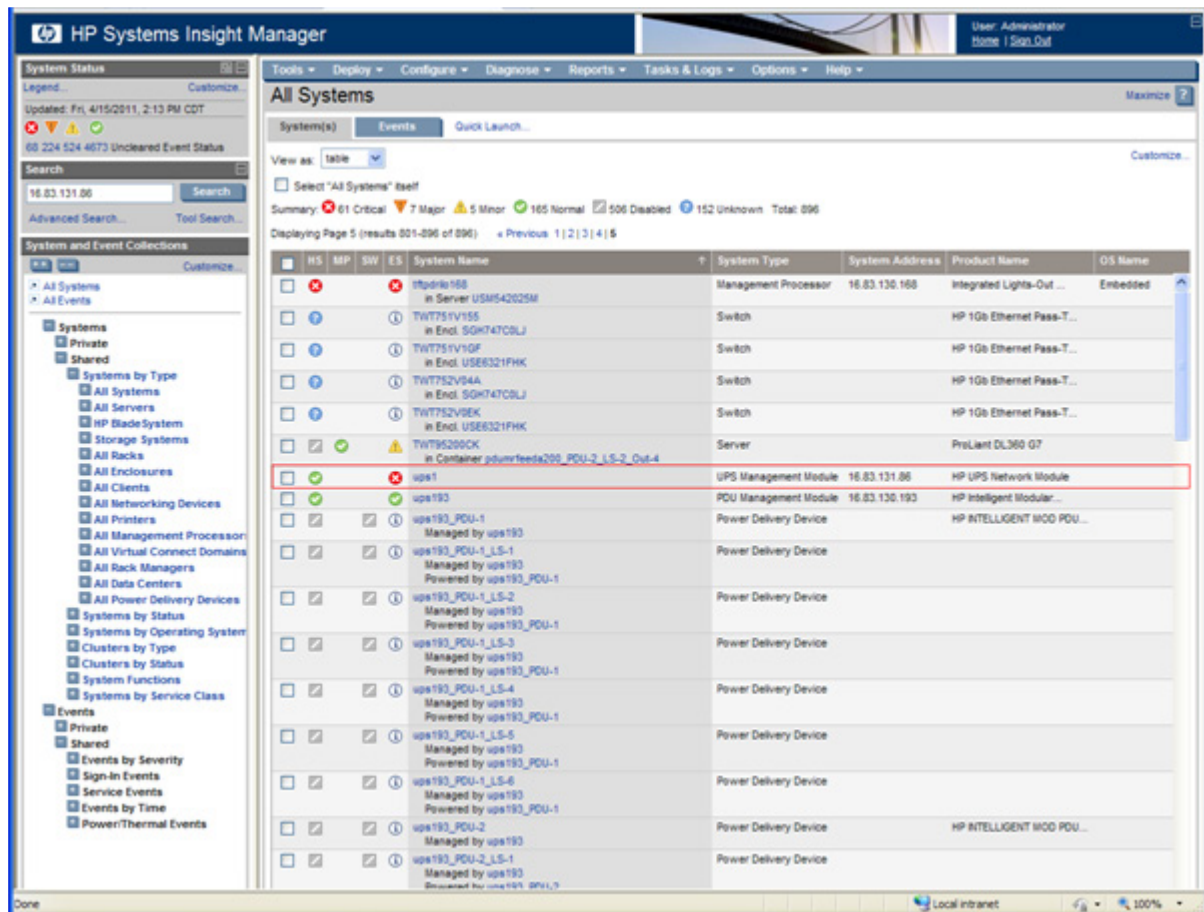
Option number	Submenu	Description
1	Read Network Settings	Enables you to view IPv4 and IPv6 network settings for the UPS Network Module
2	Modify Network Settings	Enables you to change IPv4 network settings for the UPS Network Module
3	Set Ethernet Speed	Enables you to configure the port speed for the RJ-45 Ethernet network connector
0	Exit	Returns to the previous menu

Systems Insight Manager integration

Systems Insight Manager overview

Use HPE Systems Insight Manager to:

- Discover the UPS Network Module. As part of the discovery process, HPE SIM can detect an installed UPS Network Module. The web interface for the discovered module can be launched from the HPE SIM All Systems page.



- Receive SNMP traps from the UPS Network Module. The module can send event-based traps to HPE SIM that include a URL in the trap. This functionality enables administrators to easily launch the web interface of the module in context. For example, if the UPS Network Module detects an alarm condition, the module can send a trap to HPE SIM with an attached hyperlink that routes users directly to the web interface for the attached UPS.
- Conveniently launch the UPS Network Module web interface from within HPE SIM.
 - All Systems page—All discovered UPS Network Modules appear on the All Systems page. Click the link in the System Name column to launch a browser session.
 - Event-based trap—A URL is included in each trap to link directly from HPE SIM to the Overview screen for the specific device for which the trap was sent.

Discovering the UPS Network Module

HPE SIM automatically detects UPS Network Modules as part of the device discovery process. If detected, a hyperlink is included on the HPE SIM All Systems page for the UPS on which the UPS Network Module is installed. The UPS Network Module should be installed and running before attempting discovery through HPE SIM.

If the defaults are not used, a new entry can be made to the `additionalwsdisc.props` file, located in the `CONFIG` directory in the HPE SIM install directory, to allow HPE SIM to correctly discover and identify the UPS Network Module. For more information on editing the `additionalwsdisc.props` file, see the `additionalwsdisc.txt` file located in the same directory.

Example: `ADDITIONALWSDISC.PROPS` file with UPS Network Module entry

```
# -----
# Additional Web Server Discovery Properties
#
# -----
# NOTE: See "additionalWsDisc_README.txt" for a description of entries in
# this file and how to add or remove additional web server ports used for
# discovery and identification.
# -----
#
# -----
# The following are actual web server ports enabled by default.
# To remove them from the discovery process, comment out the line with a '#'
# or remove it. You will need to restart the HP SIM service for
# the changes to take effect. In addition you will need to run the Device
# Identification task to find any new ports that were defined.
# -----
411=Director Agent, ,true,false, ,http
3201=Compaq TaskSmart, ,true,false, ,https
8008=Default Home Page, ,true,false, ,http
1311=Server Administrator, ,true,false, ,https
1234=HP UPS Network Module, ,true,false, ,https
```

The last entry allows HPE SIM to detect a UPS Network Module running on port 1234 and using HTTPS (Secure Socket Layer protocol).

HPE SIM services must be restarted to apply the change.

Configuring HPE SIM to receive traps

Before SIM can receive traps, the correct MIB file (`cpqpower.mib`) must be compiled into SIM. To download the Power MIB, visit the Hewlett Packard Enterprise website (<http://www.hpe.com/info/rackandpower>).

To register the MIB:

1. Copy the MIB to the `HPE\System Insight Manager\mibs` folder.

2. From the HP\System Insight Manager\mibs folder, run `mcompile cpqpower.mib` from the command line to compile the new MIB. A new file named `cpqpower.cfg` is created.
3. Register the new MIB by entering `mxmib -a cpqpower.cfg` from the HPE\System Insight Manager\mibs command line.
4. Enter `HP\System Insight Manager\mibs>mxmib` at the command line and verify that the new MIB is listed.

NOTE: For more information on uploading and registering the MIB in SIM, refer to the Insight Manager's technical reference guide located on the Hewlett Packard Enterprise management CD.

Configuring the UPS Network Module to send traps to HPE SIM

Add the HPE SIM server as an SNMP trap recipient on the Trap Receivers Settings screen (on page [44](#)). The configured server appears on the Notified Applications screen (on page [43](#)).

Optional power monitoring using SNMP

SNMP monitoring

Battery status, power status, events, and traps can be monitored using third-party SNMP managers. SNMP monitoring supports the RFC-1628 MIB and the HPE Power MIB (CPQPOWER.MIB).

To query SNMP data, you do not need to add SNMP Managers to the Notified Application page.

In the third-party SNMP manager, configure the IP address of the UPS Network Module, select SNMP V1 or V1&V3, and then compile either CPQPOWER.MIB or UPS.MIB (RFC1628) to be monitored by the SNMP manager.

The HPE Power MIB (CPQPOWER.MIB) can be downloaded from the Hewlett Packard Enterprise website (<http://www.hpe.com/info/rackandpower>).

Configuration parameters

Shutdown parameters

Follow these shutdown principles when configuring the shutdown parameters:

- The Shutdown initiated after value entered for the UPS Network Module must be equal to or greater than the HPEPP Client configured with the longest Shutdown initiated after time. Otherwise, the Client starts to shut down at the same time as the UPS Network Module.
Upon reset, the value defaults to the maximum value of 43200 seconds.
- The Operating system shutdown time value entered for the UPS Network Module must be equal to or greater than the HPEPP Client configured with the longest Operating system shutdown time. Otherwise, it is automatically replaced by the longest Operating system shutdown time when the Client is connected. The updated value is displayed on the Shutdown Parameters screen for the UPS Network Module.
- After the operating system shutdown begins, the shutdown process cannot be canceled, even if utility power is restored.
- For load shedding, each Client is shut down based on its own delay settings. This increases the backup time for the remaining Clients.
- The UPS Network Module waits until the operating system is shut down before powering down the load segments.
- The UPS is powered down after all load segments are powered down.
- If any other condition occurs during the Shutdown initiated after time, such as the Remaining backup time under or the Battery capacity under conditions, the UPS Network Module starts the shutdown process earlier.

The following example describes the shutdown parameters for a UPS with two load segments, four connected servers that have HPEPP Clients installed on each server, and one UPS Network Module.



Item	Description
1	Utility failure
2	Utility restore
3	Utility
4	Client 1 on load segment 1
5	Client 2 on load segment 1
6	UPS Network Module setting for load segment 1
7	Load segment 1
8	Client 3 on load segment 2
9	Client 4 on load segment 2
10	UPS Network Module setting for load segment 2
11	Load segment 2
12	UPS
	On utility
	On battery (Shutdown initiated after time)
	Operating system shutdown time
t1	Utility failure—UPS is on battery, and all servers are powered as usual
t2	Shutdown process initiated—Shutdown scripts run, applications close, and then the operating system shuts down
t3	All servers are completely powered down. Load segments power down, and then the UPS powers down.
t4	Utility restore

Item	Description
t5, t6, t7	The UPS, load segment 1, and load segment 2 are powered up

When the utility power is lost, the example UPS behaves as follows:

1. On load segment 1:
 - a. Client1—The UPS Network Module waits until t2 to start Operating system shutdown time. The server is powered down before t3.
 - b. Client2—The UPS Network Module waits until t2 to start Operating system shutdown time. The server is powered down sometime before t3.
 - c. UPS Network Module—The UPS Network Module waits until t2 to send shutdown commands to load segment 1 and all Clients. Load segment 1 powers down at t3.
2. On load segment 2:
 - a. Client3—Because the Operating system shutdown time of this Client is the longest, it replaced the Operating system shutdown time of the UPS Network Module after it was connected to the UPS Network Module. Client 3 powers down as configured.
 - b. Client4—Because the Shutdown initiated after value of the UPS Network Module is less than that of Client 4, the UPS Network Module starts the shutdown process first. Client 4 is forced to start its Operating system shutdown time at the same time.
 - c. UPS Network Module—The UPS Network Module waits until t2 to initiate the shutdown sequence for load segment 2 and the other Clients. Load segment 2 powers down at a new t3, which is the same as the longest Client Operating system shutdown time.
3. UPS—The UPS starts the countdown at t2 of UPS Network Module on load segment 2, and then powers down at t3 of UPS Network Module on load segment 2 because the associated shutdown command occurs first and ends last compared to the Operating system shutdown time of UPS Network Module on load segment 1.

When the utility power is restored, the example UPS behaves as follows:

1. t5—If the Battery capacity exceeds condition exists, the UPS is powered up.
2. t6 and t7—If the Switch On after condition exists, the load segment is powered up.
3. If Automatic Power ON is enabled in the BIOS setup of the Client server, the server powers up as soon as power is detected.

Updating the firmware

Updating the firmware overview

Use the Firmware Upload screen (on page 48) to update the UPS Network Module firmware.

During the boot process, if the UPS Network Module detects that the application is corrupt, you are prompted to enter the TFTP server IP address. This process is only available when the application is damaged.

To update the firmware image from the bootloader:

1. Setup a TFTP server.
2. Load the firmware image, and then rename the image to `image.bin`.
3. Copy the `image.bin` file to the default directory.
4. Be sure that you have connected the configuration cable to the UPS Network Module and the host computer. For more information, see "Connecting the configuration cable (on page 12)."
5. Launch a terminal emulation program, such as HyperTerminal. For more information, see "Launching a terminal emulation program (on page 13)."

The following menu appears:

```
-----  
-----  
HP  
NETWORK MANAGEMENT CARD  
BOOTLOADER VERSION : 1.1  
-----  
-----  
RAM autotest in progress.  
RAM autotest SUCCESS.  
  
Commercial reference : 66102  
Kitting technical level : 12  
Kitting revision : GD  
Ethernet MAC Address : 00:20:85:FD:A1:9C  
Serial number : BJ0L050LD  
  
PHY autotest SUCCESS  
  
The application in FLASH is corrupted !!!  
Run the TFTP server to download the image.bin file  
  
Set the TFTP server IP address :
```

6. Enter the IP address of the TFTP server, and then press **Enter**.

Firewall configuration

Configuring the firewall on Windows

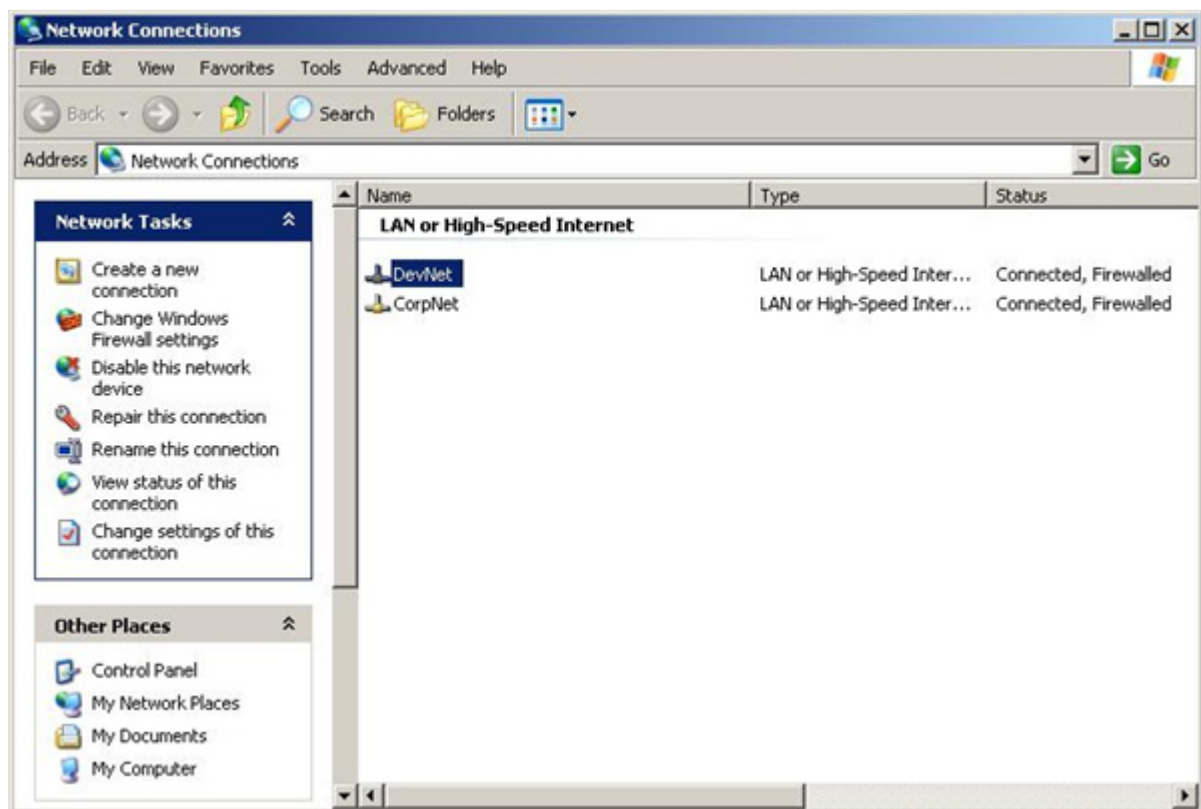
NOTE: For other operating systems, see the operating system documents on enabling or disabling ports on the firewall.

Windows Firewall blocks most communication through unused IP ports. This prevents a server with the HPEPP Client installed from using the following four ports to communicate with the UPS Network Module:

- 4679/UDP and TCP (Client)
- 4680/UDP and TCP (Client)
- 5000/TCP (Alarms)
- 5001/TCP (Alarms)

To configure the Windows XP with Service Pack 2 Firewall to make an exception for ports 4679, 4680, 5000, and 5001:

1. Click **Start**, select **Control Panel**, and then double-click **Network Connections**. The Network Connections screen appears.



2. Right-click the network connection where you are configuring the firewall, and then select **Properties**. The Properties screen appears.
3. Click the **Advanced** tab.

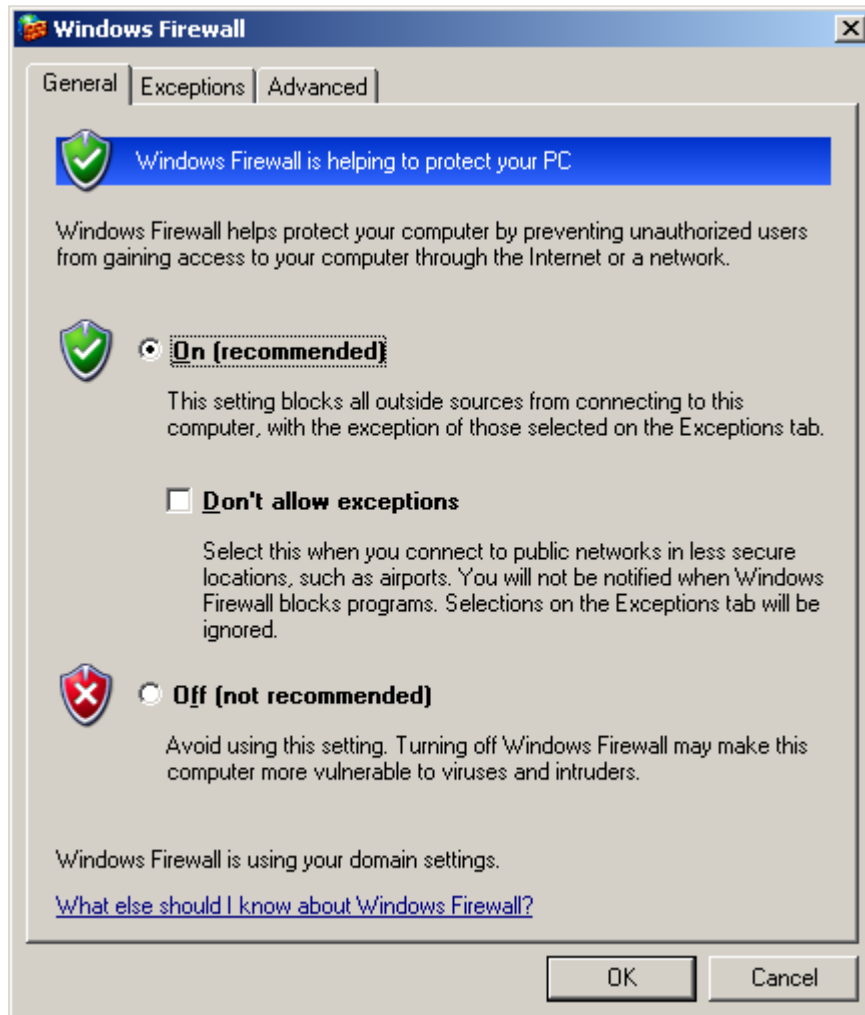
4. In the Windows Firewall box, click **Settings**.



The Windows Firewall screen appears.

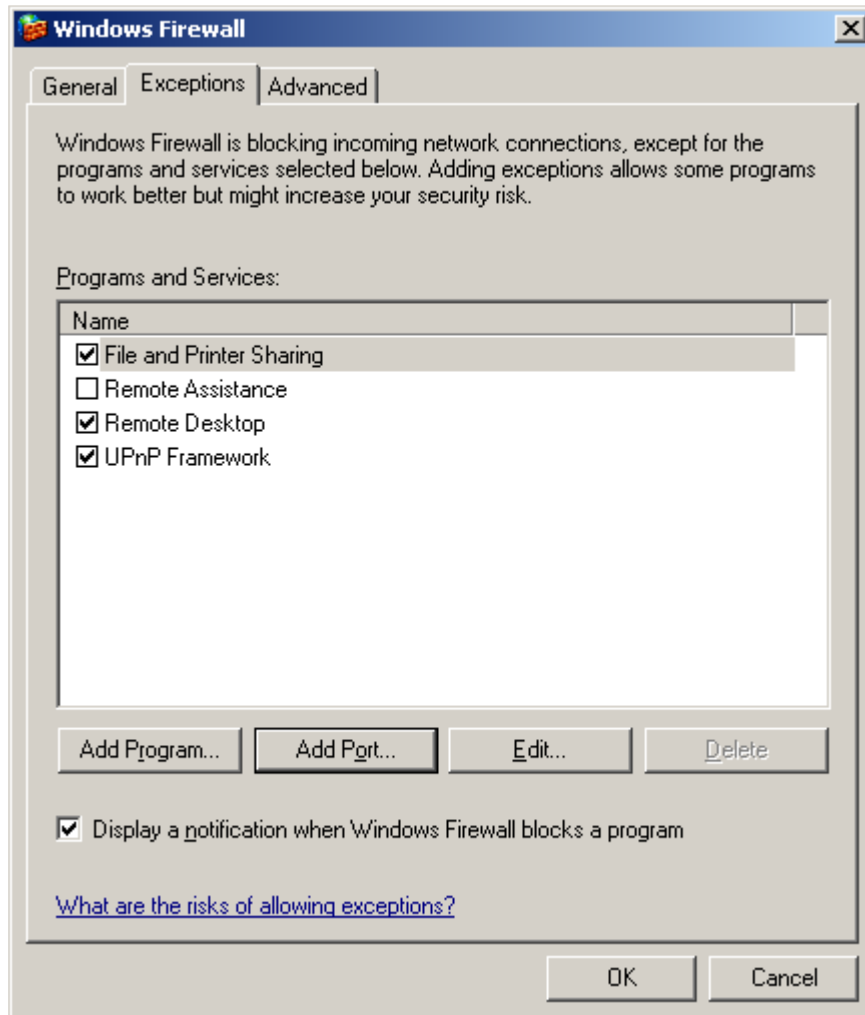
5. On the General tab, verify that the Windows Firewall is enabled (On) and that the Don't allow exceptions checkbox is not checked.

6. Click **OK**.



7. On the network Properties screen, click the **Exceptions** tab.
8. Be sure that the File and Printer Sharing check box is selected.

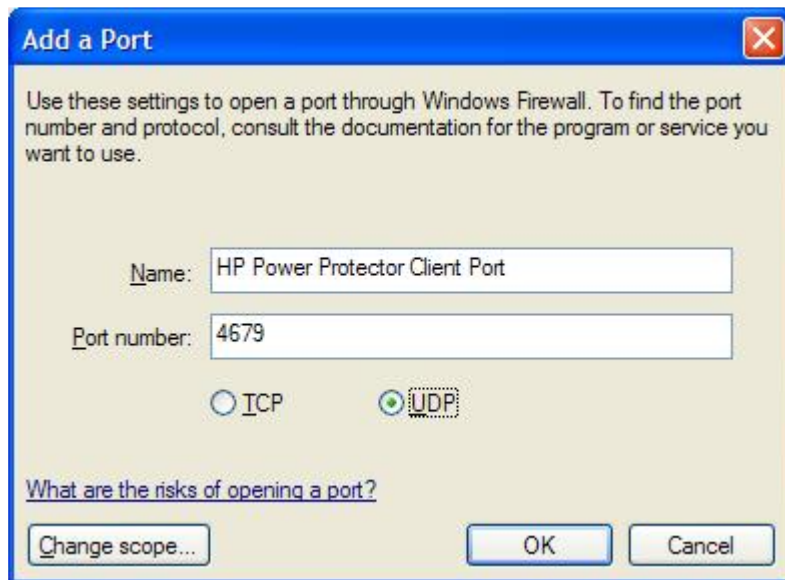
9. Click **Add Port** to allow communication through ports 4679, 4680, 5000, and 5001.



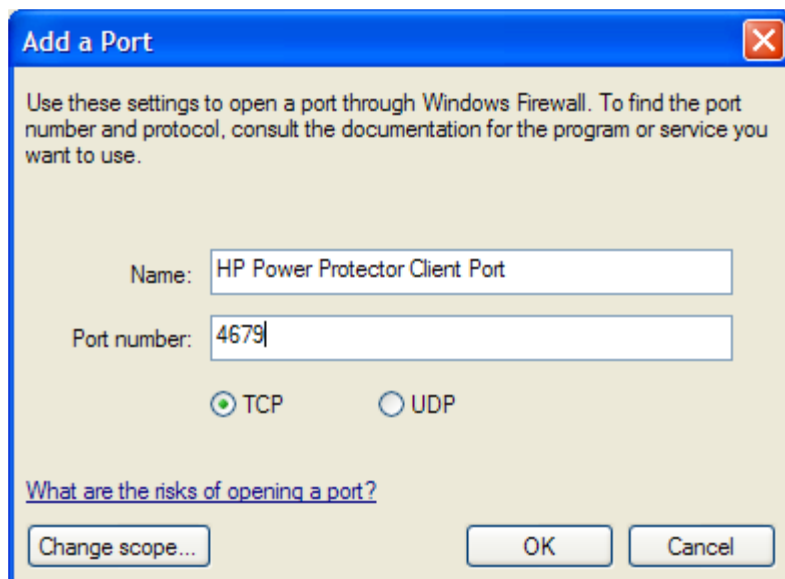
The Add a Port screen appears.

10. Enter a name for the HPEPP Client port in the Name field.
11. Enter 4679, 4680, 5000, or 5001 in the port number field.
12. Select the appropriate radio button.

13. Click **Change scope** to add more security to the port exception.



The 'Add a Port' dialog box has a blue title bar with the text 'Add a Port' and a close button. Below the title bar, there is instructional text: 'Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.' The dialog contains two text input fields: 'Name:' with the value 'HP Power Protector Client Port' and 'Port number:' with the value '4679'. Below these fields are two radio buttons for protocol selection: 'TCP' (unselected) and 'UDP' (selected, indicated by a green dot). At the bottom, there is a link 'What are the risks of opening a port?' and three buttons: 'Change scope...', 'OK', and 'Cancel'.



This is another instance of the 'Add a Port' dialog box, identical in layout to the one above. It has the same title bar, instructional text, and input fields for 'Name' ('HP Power Protector Client Port') and 'Port number' ('4679'). However, the protocol selection at the bottom shows 'TCP' (selected with a green dot) and 'UDP' (unselected). The 'Change scope...', 'OK', and 'Cancel' buttons are also present at the bottom.

Add a Port 

Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.

Name:

Port number:

☐ TCP ☒ UDP

[What are the risks of opening a port?](#)

Add a Port 

Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.

Name:

Port number:

☒ TCP ☐ UDP

[What are the risks of opening a port?](#)

Add a Port

Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.

Name:

Port number:

☒ ICP ☐ UDP

[What are the risks of opening a port?](#)

Add a Port

Use these settings to open a port through Windows Firewall. To find the port number and protocol, consult the documentation for the program or service you want to use.

Name:

Port number:

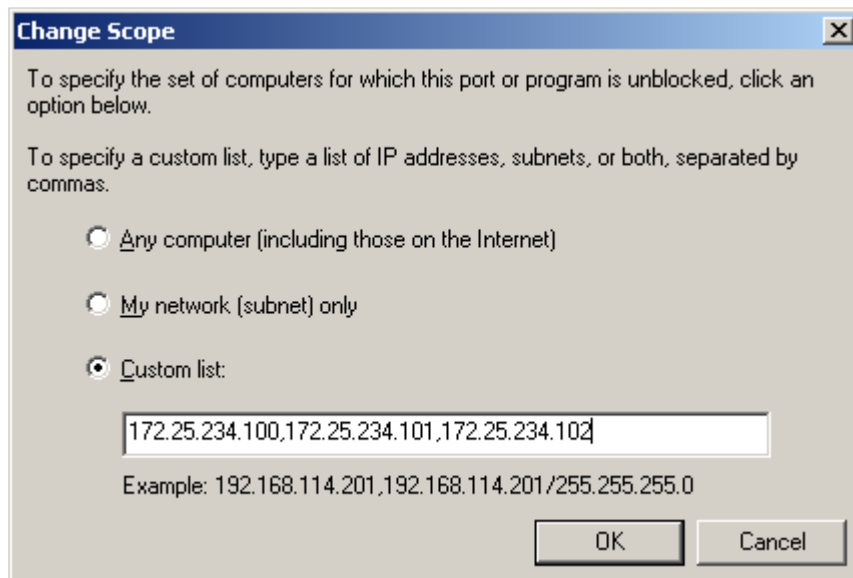
☒ ICP ☐ UDP

[What are the risks of opening a port?](#)

The Change Scope screen appears.

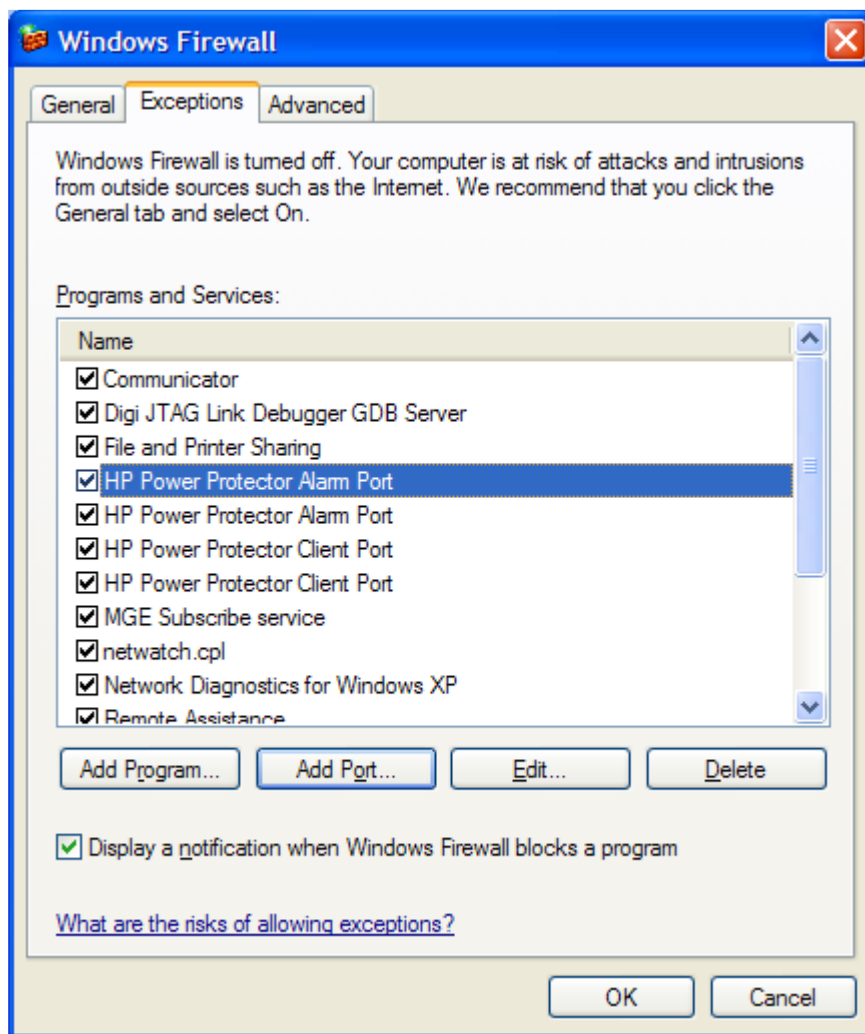
14. Select the **Custom list** radio button, and then add the IP addresses that are allowed to communicate through the specified port.

15. Click **OK** to save the scope settings.



16. On the Edit a Port screen, click **OK** to finish adding the exception port.
The Windows Firewall screen displays the newly added HPEPP Client port.
17. Click **OK**.

NOTE: Software that helps to protect your computer and blocks access on the network, such as Windows Defender or firewalls, needs to be reconfigured.



Security considerations

Security considerations overview

The UPS Network Module implements strict security for two important reasons:

- The UPS Network Module manages devices that have the potential to perform operations that are sensitive and destructive.
- The UPS Network Module has browser accessibility.

To better ensure the security of the UPS Network Module and the devices it manages, consider the following topics in accordance with your organization's security policies and the environment in which the UPS Network Module operates.

- Remote access to the UPS Network Module requires a user account. Logging in requires the use of a user name and password, which should be kept properly secured.
- Each account can be given different access levels, providing different capabilities. Ensure that the appropriate access level is granted to users.
- Browsing to the UPS Network Module can be done using SSL, which encrypts the data between the browser and UPS Network Module. The UPS Network Module is supported by a 128-bit encryption level. SSL also provides authentication of the UPS Network Module by means of its digital certificate. Securely importing this certificate must be done to ensure the identification of the UPS Network Module.

Alert messages

UPS alarms

- Emergency Power Off
- Emergency Power Off Cleared
- UPS ABM Controller Disabled
- UPS ABM Controller Enabled
- UPS AC Module Failure
- UPS AC Module Failure Cleared
- UPS Auto Bypass Overload
- UPS Auto Bypass Overload Cleared
- UPS Battery Charger Failure
- UPS Battery Charger Failure Cleared
- UPS Battery Discharged
- UPS Battery Discharged Cleared
- UPS Battery Disconnected
- UPS Battery Disconnected Cleared
- UPS Battery Low
- UPS Battery Low Cleared
- UPS Battery Over Voltage
- UPS Battery Over Voltage Cleared
- UPS Battery Test Failure
- UPS Battery Test Failure Cleared
- UPS Bypass AC Phase Out of Range
- UPS Bypass AC Phase Out of Range Cleared
- UPS Bypass Frequency Out Of Range
- UPS Bypass Frequency Out Of Range Cleared
- UPS Bypass Not Available
- UPS Bypass Not Available Cleared
- UPS Bypass Voltage Out Of Range
- UPS Bypass Voltage Out Of Range Cleared
- UPS Client Communication Lost
- UPS Client Communication Restored
- UPS DC Bus High Negative Voltage

- UPS DC Bus High Negative Voltage Cleared
- UPS DC Bus High Positive Voltage
- UPS DC Bus High Positive Voltage Cleared
- UPS DC Bus Low Negative Voltage
- UPS DC Bus Low Negative Voltage Cleared
- UPS DC Bus Low Positive Voltage
- UPS DC Bus Low Positive Voltage Cleared
- UPS Fan Failure
- UPS Fan Failure Cleared
- UPS In High Efficiency Mode
- UPS Input AC Not Present
- UPS Input AC Not Present Cleared
- UPS Input AC Over Voltage
- UPS Input AC Over Voltage Cleared
- UPS Input AC Under Voltage
- UPS Input AC Under Voltage Cleared
- UPS Input Frequency Out Of Range
- UPS Input Frequency Out Of Range Cleared
- UPS Internal Configuration Failure
- UPS Internal Configuration Failure Cleared
- UPS Internal Failure
- UPS Internal Failure Cleared
- UPS Inverter Failure
- UPS Inverter Failure Cleared
- UPS Inverter Over Voltage
- UPS Inverter Over Voltage Cleared
- UPS Inverter Overload
- UPS Inverter Overload Cleared
- UPS Inverter Under Voltage
- UPS Inverter Under Voltage Cleared
- UPS Load Segment 1 Is Off
- UPS Load Segment 1 Is On
- UPS Load Segment 2 Is Off
- UPS Load Segment 2 Is On
- UPS Load Segment 3 Is Off
- UPS Load Segment 3 Is On
- UPS On Auto Bypass

- UPS On Auto Bypass Cleared
- UPS On Battery
- UPS On Battery Cleared
- UPS On Boost
- UPS On Boost Cleared
- UPS On Buck
- UPS On Buck Cleared
- UPS On Manual Bypass
- UPS On Manual Bypass Cleared
- UPS Output Is Off
- UPS Output Is On
- UPS Output Overload
- UPS Output Overload Cleared
- UPS Output Overload Level 1
- UPS Output Overload Level 1 Cleared
- UPS Output Overload Level 2
- UPS Output Overload Level 2 Cleared
- UPS Output Short Circuit
- UPS Output Short Circuit Cleared
- UPS Over Temperature
- UPS Over Temperature Cleared
- UPS Rectifier Failure
- UPS Rectifier Failure Cleared
- UPS Rectifier Overload
- UPS Rectifier Overload Cleared
- UPS Redundant Communication Lost
- UPS Redundant Communication Restored
- UPS Shutdown Imminent
- UPS Shutdown Imminent Cleared
- UPS Shutdown in {time}
- UPS Shutdown Pending
- UPS Single Wave Load Fault
- UPS Single Wave Load Fault Cleared
- UPS Site Wiring Fault
- UPS Site Wiring Fault Cleared

SNMP trap codes

SNMP trap codes

This information is for reference only.

SNMP trap code	SNMP trap message
1	UPS Shutdown in {time}
2	UPS Shutdown Pending
3	UPS Battery Disconnected
3	UPS Battery Disconnected Cleared
4	UPS Battery Discharged Cleared
4	UPS Battery Discharged
5	UPS Battery Over Voltage Cleared
5	UPS Battery Over Voltage
6	UPS Battery Charger Failure Cleared
6	UPS Battery Charger Failure
7	UPS ABM Controller Disabled
7	UPS ABM Controller Enabled
8	UPS Load Segment 1 Is Off
8	UPS Load Segment 1 Is On
9	UPS Load Segment 2 Is Off
9	UPS Load Segment 2 Is On
10	UPS Load Segment 3 Is Off
10	UPS Load Segment 3 Is On
11	UPS On Boost Cleared
11	UPS On Boost
12	UPS On Buck Cleared
12	UPS On Buck
13	UPS Input Frequency Out Of Range Cleared
13	UPS Input Frequency Out Of Range
14	UPS AC Module Failure Cleared
14	UPS AC Module Failure
15	UPS Input AC Not Present Cleared
15	UPS Input AC Not Present
16	UPS Input AC Over Voltage Cleared
16	UPS Input AC Over Voltage
17	UPS Input AC Under Voltage Cleared
17	UPS Input AC Under Voltage
18	UPS Site Wiring Fault Cleared
18	UPS Site Wiring Fault
19	UPS Bypass Frequency Out Of Range Cleared
19	UPS Bypass Frequency Out Of Range
20	UPS Bypass Not Available
20	UPS Bypass Not Available Cleared

SNMP trap code	SNMP trap message
21	UPS Auto Bypass Overload Cleared
21	UPS Auto Bypass Overload
22	UPS Bypass AC Phase Out of Range Cleared
22	UPS Bypass AC Phase Out of Range
23	UPS On Auto Bypass Cleared
23	UPS On Auto Bypass
24	UPS Bypass Voltage Out Of Range Cleared
24	UPS Bypass Voltage Out Of Range
25	UPS On Manual Bypass Cleared
25	UPS On Manual Bypass
26	UPS In High Efficiency Mode
27	UPS Inverter Failure Cleared
27	UPS Inverter Failure
28	UPS Inverter Overload Cleared
28	UPS Inverter Overload
29	UPS Inverter Over Voltage Cleared
29	UPS Inverter Over Voltage
30	UPS Inverter Under Voltage Cleared
30	UPS Inverter Under Voltage
31	UPS Output Overload Level 1 Cleared
31	UPS Output Overload Level 1
32	UPS Output Overload Level 2 Cleared
32	UPS Output Overload Level 2
33	UPS Output Short Circuit Cleared
33	UPS Output Short Circuit
34	UPS Single Wave Load Fault Cleared
34	UPS Single Wave Load Fault
35	UPS DC Bus High Negative Voltage Cleared
35	UPS DC Bus High Negative Voltage
36	UPS DC Bus High Positive Voltage Cleared
36	UPS DC Bus High Positive Voltage
37	UPS Rectifier Failure Cleared
37	UPS Rectifier Failure
38	UPS DC Bus Low Negative Voltage Cleared
38	UPS DC Bus Low Negative Voltage
39	UPS DC Bus Low Positive Voltage Cleared
39	UPS DC Bus Low Positive Voltage
40	UPS Rectifier Overload Cleared
40	UPS Rectifier Overload
41	UPS Client Communication Restored
41	UPS Client Communication Lost
42	UPS Redundant Communication Restored
42	UPS Redundant Communication Lost
43	UPS On Battery
43	UPS On Battery Cleared
44	UPS Battery Low Cleared

SNMP trap code	SNMP trap message
44	UPS Battery Low
45	UPS Communication Restored
45	UPS Communication Lost
46	UPS Internal Configuration Failure Cleared
46	UPS Internal Configuration Failure
47	Emergency Power Off Cleared
47	Emergency Power Off
48	UPS Fan Failure Cleared
48	UPS Fan Failure
49	UPS Output Is Off
49	UPS Output Is On
50	UPS Internal Failure Cleared
50	UPS Internal Failure
51	UPS Battery Test Failure Cleared
51	UPS Battery Test Failure
52	UPS Output Overload Cleared
52	UPS Output Overload
53	UPS Over Temperature Cleared
53	UPS Over Temperature
54	UPS Shutdown Imminent Cleared
54	UPS Shutdown Imminent

Specifications

Technical characteristics

Item	Description
<i>Physical characteristics</i>	
Dimensions (width x depth x height)	132 x 66 x 42 mm (5.20 x 2.60 x 1.65 in)
Weight	70 g (.15 lb)
RoHS	100% compatible
<i>Storage</i>	
Storage temperature range	-10°C to 70°C (14°F to 158°F)
<i>Ambient conditions</i>	
Operating temperature range	0°C to 40°C (32°F to 104°F)
Relative humidity	90% maximum, noncondensing
<i>Card performance</i>	
Supply voltage	5V ±5%
Supply current (all LEDs on)	300 mA maximum
<i>Functions</i>	
Web supervision	HTTP—5 browser windows maximum HTTPS—3 browser windows maximum
Languages	English or Japanese
Alarms	Email, SNMP trap, web interface
Log	400 measurements or events
Server protection	Up to 100 servers protected
Network	Fast ETHERNET, 10/100 Mb/s, autonegotiation HTTP 1.1, SNMP V1, SNMP V3, NTP, TFTP, SMTP, DHCP
Identification	User name and password
Security	SSL 3.0, TLS 1.0
Browsers	Microsoft® Internet Explorer 6.x or higher
NMS	HPE Systems Insight Manager
MIB	Standard IETF UPS MIB (RFC 1628) HPE Power MIB (cpqpower.mib)
<i>Settings (default values)</i>	
IP network	DHCP enabled IP address: 192.168.1.2 (manual configuration) Subnet mask: 255.255.0.0 Gateway: 0.0.0.0 NTP server: pool.ntp.org
Web interface access control	User name: admin Password: admin
Configuration menu access control	Password: admin (not modifiable)
Date and time	Synchronize with HPE Power Protector

Item	Description
Settings/AUX connector	9600 bits/s, 8 bits, 1 bit stop, no parity

Default parameters

Parameter	Default value	Possible value
<i>Network</i>	—	—
IP address	192.168.1.2	Network IP address
Subnet mask	255.255.0.0	Network IP address
Gateway Address	0.0.0.0	Network IP address
BOOTP/DHCP	Enabled	Active / Deactivated
IPv6 Enabled	Enabled	Active / Deactivated
IPv6 Auto Config Enabled	Enabled	Active / Deactivated
Firmware Upload	Enabled	Active / Deactivated
SMTP server	smtpserver	49 characters maximum
<i>System</i>	—	—
UPS Contact	Computer Room Manager	49 characters maximum
UPS Location	Computer Room	31 characters maximum
History log interval (sec.)	60	10 to 99999 sec.
Default Language	English	English / Japanese
<i>Notified Application table</i>	—	—
—	empty	NA
<i>Access control</i>	—	—
User name	admin	5 characters minimum, 31 characters maximum
Password	admin	5 characters minimum, 31 characters maximum
<i>SNMP</i>	—	—
Community name read	public	32 alphanumeric characters maximum, no spaces
Trap port	162	Not configurable
SNMP Version	V1&V3	Disabled, V1, V3, V1&V3
Read-Only User	readuser	1 character minimum, 32 characters maximum
Read-Only Security Level	Authentication	None, Authentication, Authentication&Privacy
Read-Only Password	readuser	8 characters minimum, 24 characters maximum
Read-Write User	wirteuser	1 character minimum, 32 characters maximum
Read-Write Security Level	Authentication&Privacy	None, Authentication, Authentication&Privacy
Read-Write Password	writeuser	8 characters minimum, 24 characters maximum
<i>Date and time</i>	—	—
Date and time adjustment	Accept automatic update from HPE Power Protector	Synchronize with an NTP server, Accept automatic update from HPE Power Protector, Synchronize manually
NTP server	ntpserver	49 characters maximum
<i>Serial link</i>	—	—
Speed	9600 baud	Not configurable
Data bits	8	Not configurable
Stop bits	1	Not configurable

Parameter	Default value	Possible value
Parity	without	Not configurable
Flow control	without	Not configurable

Troubleshooting

Client communication failure with HPE UPS Network Module in a VMware operating system

Possible Cause: The Client was installed on the guest operating system.

Action: Install the Client on the host VMware operating system (for ESX) or on VIMA/VMA (for ESXi). Do not install the Client on the guest operating system. When the Client receives a shutdown notification from the HPE UPS Network Module, it sends an operating system shutdown command to the VMware host operating system, and then the VMware shuts down the guest operating system based on a preset configuration.

Client server is not restarting

Symptom: Utility power has been restored, the UPS and its load segments are powered on, but the Client server does not restart.

Possible Cause: The “Automatic Power ON” server setup setting might be disabled.

Action: In the server system BIOS, change the setting for Automatic Power ON to "Enabled."

Clients cannot communicate with UPS after swapping HPE UPS Network Module with another UPS

Possible Cause: The HPE UPS Network Module and Clients are configured with an old power source.

Action: Reconfigure the HPE UPS Network Module power source, and then reconfigure the Client power source.

Failure to communicate with the serial or USB ports

Symptom: There is a failure to communicate with the serial or USB ports while upgrading the UPS or CommBoard firmware.

Possible Cause: A UPS Network Module is installed in the UPS minislots.

Action: Remove the UPS Network Module from the UPS minislots when upgrading the firmware using the serial or USB ports.

Forgot login password

Action: To reset the login password, use the supplied serial cable to connect to the UPS Network Module through a terminal emulation programs, such as HyperTerminal, with the following parameters:

- Bits per second—9600
- Data bits—8

- Parity—None
- Stop bits—1
- Flow control—None

The default password to access the serial configuration menu is “admin”.

UPS Network Module fails to boot after upgrading the firmware

Possible Cause: The application might be corrupted due to an interruption while flashing the firmware.

Action:

1. Using the supplied serial cable, connect to the UPS Network Module through a terminal emulation program, such as HyperTerminal, with the following parameters:
 - Bits per second—9600
 - Data bits—8
 - Parity—None
 - Stop bits—1
 - Flow control—None

In the HyperTerminal window, the UPS Network Module Bootloader prompts for a TFTP IP address.

2. Setup a TFTP server.
3. Copy the UPS Network Module firmware image file to the TFTP server default folder.
4. Rename the UPS Network Module image file to `image.bin`.
5. Launch the TFTP.
6. Enter the TFTP server IP address at the prompt on the terminal emulation program window.
7. Press **Enter**.

UPS is not powered on after a scheduled shutdown

Possible cause: The Restart time value might be configured as less than the Shutoff time value.

Action: Configure the Restart time to a greater value than the Shutoff time value.

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website (<http://www.hpe.com/assistance>).
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>).

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
 - Hewlett Packard Enterprise Support Center **Get connected with updates** page (<http://www.hpe.com/support/e-updates>)
 - Software Depot website (<http://www.hpe.com/support/softwaredepot>)
- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page (<http://www.hpe.com/support/AccessToSupportMaterials>).



IMPORTANT: Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

- Hewlett Packard Enterprise Information Library (<http://www.hpe.com/info/enterprise/docs>)
- Hewlett Packard Enterprise Support Center (<http://www.hpe.com/support/hpesc>)
- Contact Hewlett Packard Enterprise Worldwide (<http://www.hpe.com/assistance>)

- Subscription Service/Support Alerts (<http://www.hpe.com/support/e-updates>)
- Software Depot (<http://www.hpe.com/support/softwaredepot>)
- Customer Self Repair (<http://www.hpe.com/support/selfrepair>)
- Insight Remote Support (<http://www.hpe.com/info/insightremotesupport/docs>)
- Serviceguard Solutions for HP-UX (<http://www.hpe.com/info/hpux-serviceguard-docs>)
- Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix (<http://www.hpe.com/storage/spock>)
- Storage white papers and analyst reports (<http://www.hpe.com/storage/whitepapers>)

Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the Insight Remote Support website (<http://www.hpe.com/info/insightremotesupport/docs>).

Regulatory compliance notices

Safety and regulatory compliance

For important safety, environmental, and regulatory information, see *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the Hewlett Packard Enterprise website (<http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts>).

Warranty information

HPE ProLiant and x86 Servers and Options (<http://www.hpe.com/support/ProLiantServers-Warranties>)

HPE Enterprise Servers (<http://www.hpe.com/support/EnterpriseServers-Warranties>)

HPE Storage Products (<http://www.hpe.com/support/Storage-Warranties>)

HPE Networking Products (<http://www.hpe.com/support/Networking-Warranties>)

Acronyms and abbreviations

AC

alternating current

BOOTP

Bootstrap Protocol

DC

domain controller

DHCP

Dynamic Host Configuration Protocol

DNS

domain name system

HPEPP

HPE Power Protector

HTTPS

hypertext transfer protocol secure sockets

IPv4

Internet Protocol version 4

IPv6

Internet Protocol version 6

kVA

kilovolt-ampere

MAC

Media Access Control

MIB

management information base

NTP

network time protocol

SIM

Systems Insight Manager

SMS

short message service

SSL

Secure Sockets Layer

TFTP

Trivial File Transfer Protocol

UDP

User Datagram Protocol

UPS

uninterruptible power system

USB

universal serial bus

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (<mailto:docsfeedback@hpe.com>). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.

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