HP R1500 G3 UPS
User Guide

Abstract

This document includes installation, configuration, and operation information for the HP R1500 G3 UPS. This document is for the person who installs and maintains power products. HP assumes you are qualified in the servicing of high-voltage equipment and trained in recognizing hazards in products with hazardous energy levels.

Contents

Component identification

UPS R1500 G3 overview

The HP UPS R1500 G3 features a 1U rack-mount design and offers power protection for loads up to 1440 VA/1000 W (NA), 1200 VA/900 W (JPN/TWN) or 1500 VA/1000 W (INTL).

To benefit from the latest product enhancements, update to the latest versions of UPS firmware and software.

> **NOTE:**   To download the latest versions of UPS firmware and software, see the HP website (http://www.hp.com/go/rackandpower).
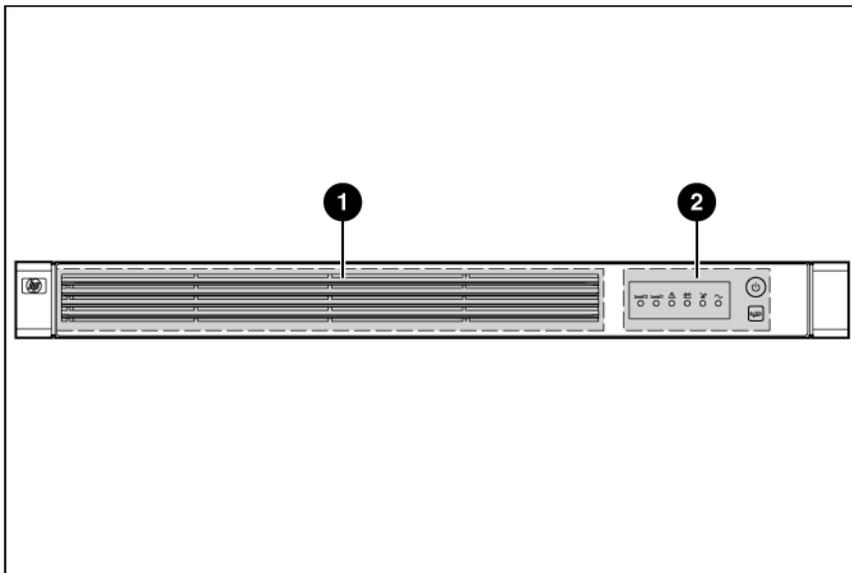
UPS front panel

Item	Description
1	Battery compartment
2	Control buttons and LED display

UPS front panel controls
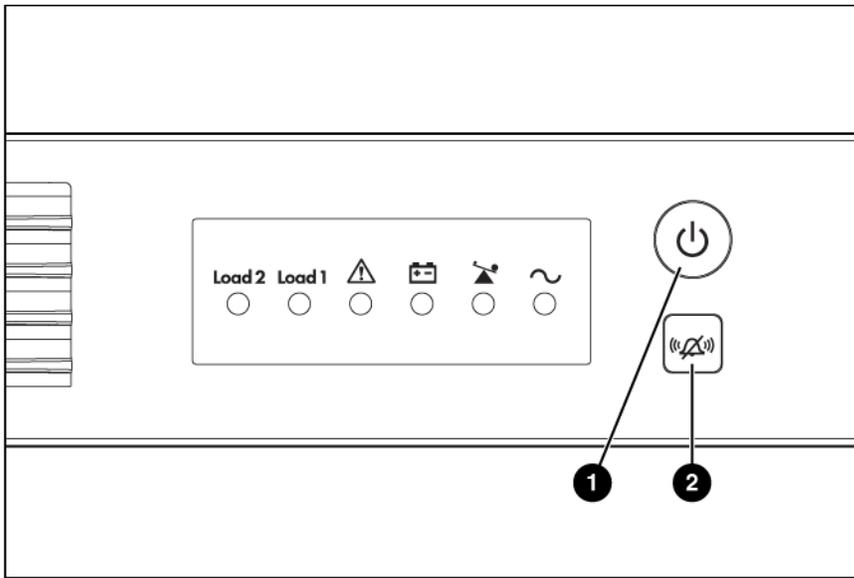
Item	Description	Function
1	Power On/Standby button	Powers up the UPS ("Powering up the UPS" on page 16).
		Powers down the UPS ("Powering down the UPS" on page 20).
2	Test/Alarm Reset button	Initiates a self-test ("Initiating a self-test" on page 19).
		Silences UPS alarms ("Silencing an audible alarm" on page 19).

UPS front panel LED indicators
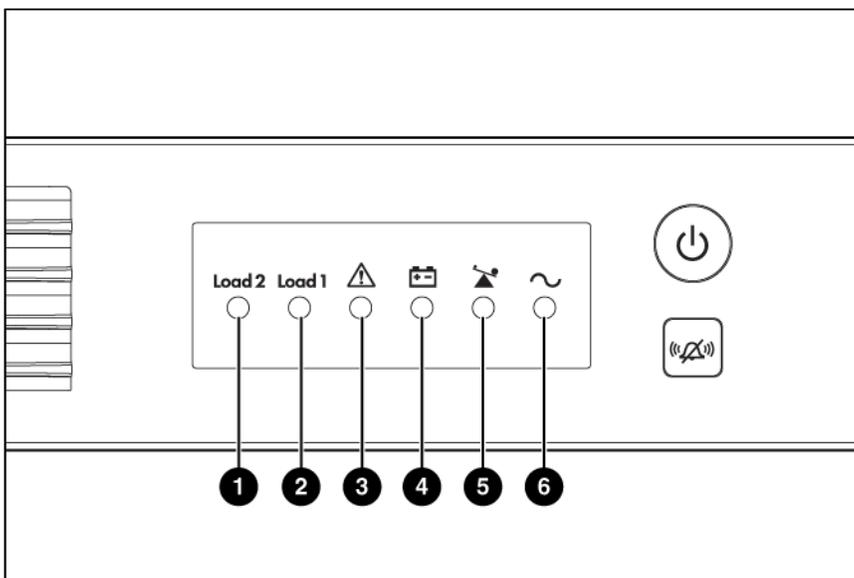
Item	LED description
1	Load Segment 2
2	Load Segment 1
3	General Alarm
4	On Battery
5	Overload
6	Power On

For more information, see "LED and audible alarm troubleshooting (on page 30)."

UPS R1500 G3 NA/JPN/TWN rear panel
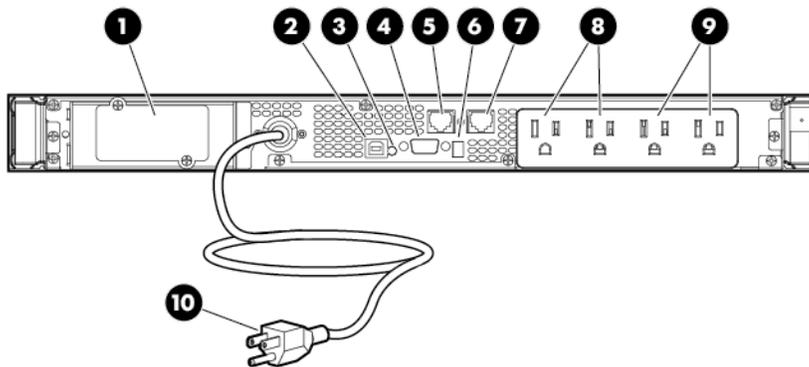
Item	Description
1	UPS option card slot
2	USB communications port
3	Site Wiring Fault LED
4	Serial communications port
5	Network Transient Protector IN jack
6	Voltage configuration DIP switches
7	Network Transient Protector OUT jack
8	Load segment 1 (two NEMA 5-15 output receptacles for surge and battery backup protection)
9	Load segment 2 (two NEMA 5-15 output receptacles for surge and battery backup protection)
10	Input power cord with NEMA 5-15 plug (BSMI approved for TWN)

UPS R1500 G3 INTL rear panel
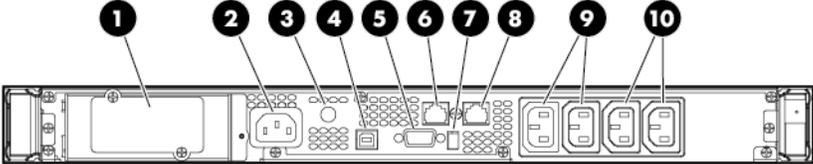
Item	Description
1	UPS option card slot
2	Input power connector (IEC-320-C14 power inlet)
3	Input circuit breaker
4	USB communications port
5	Serial communications port
6	Network Transient Protector IN jack
7	Voltage configuration DIP switches
8	Network Transient Protector OUT jack
9	Load segment 1 (two IEC-320-C13 output receptacles for surge and battery backup protection)
10	Load segment 2 (two IEC-320-C13 output receptacles for surge and battery backup protection)

Installation

Precautions

Save these instructions. This document contains important safety instructions that should be followed during installation, operation, and maintenance of the UPS and batteries.

⚠ **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.

⚠ **WARNING:** To prevent personal injury from earth conductor leakage current:
- Do not operate the UPS while disconnected from the utility power source.
- Disconnect load devices before disconnecting the UPS from the utility power source.

⚠ **WARNING:** To prevent personal injury, prepare the area and observe all materials handling procedures when transporting the UPS. When fully assembled, the UPS weighs 23 kg (50.5 lb).

Preparing to install the hardware

Before installing the hardware:

1. Be sure the necessary tools and materials ("Tools required" on page 9) are available.
2. Select an installation site ("Selecting a site" on page 9).
3. Prepare the equipment ("Readying the equipment" on page 10) for installation in the rack.

Tools required

A Philips screwdriver is required.

Selecting a site

⚠ **WARNING:** To prevent fire or electric shock, install the unit in a temperature- and humidity-controlled indoor environment, free of conductive contaminants.

When selecting a site, consider the following factors:

- Elevated operating ambient temperature—If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than room ambient temperature. Install the equipment in an environment compatible with the operating temperature ("Environmental specifications" on page 35).
- Reduced air flow—In the rack, the rate of air flow required for safe operation of the equipment must not be compromised.

- Circuit overloading—Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable earthing—Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit, such as the use of power strips.
- Electrical requirements—All models require a dedicated (unshared) branch circuit, suitably rated for the specific UPS as stated in "Input specifications" .

Readying the equipment

1. Check the battery recharge date specified on the label that is affixed to the shipping carton.

   IMPORTANT: Do not use the battery if the recharge date has passed. If the date on the battery recharge date label has passed without the battery being recharged, contact an HP authorized service representative for directions.

2. Transport the packaged unit to its installation location.

3. Unpack the equipment near the rack where the unit will be assembled.

   CAUTION: Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.

Installing the UPS

Before installing the unit, review and adhere to all warnings provided in "Precautions (on page 9)."

WARNING: A risk of personal injury or damage to the equipment exists. Uneven loading of equipment in the rack might cause the rack to become unstable. Install the heavier components first, and then continue to populate the rack from the bottom to the top.

1. Install the mounting rails.

2. Attach the chassis to the rack using the supplied screws.
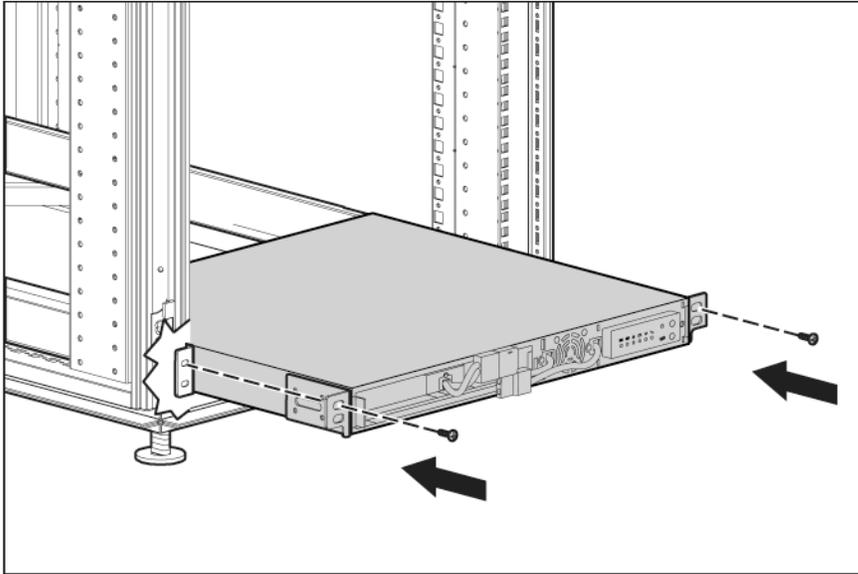
3. (optional) Insert the rear stabilization brackets into the mounting rails and then attach the brackets to the UPS.
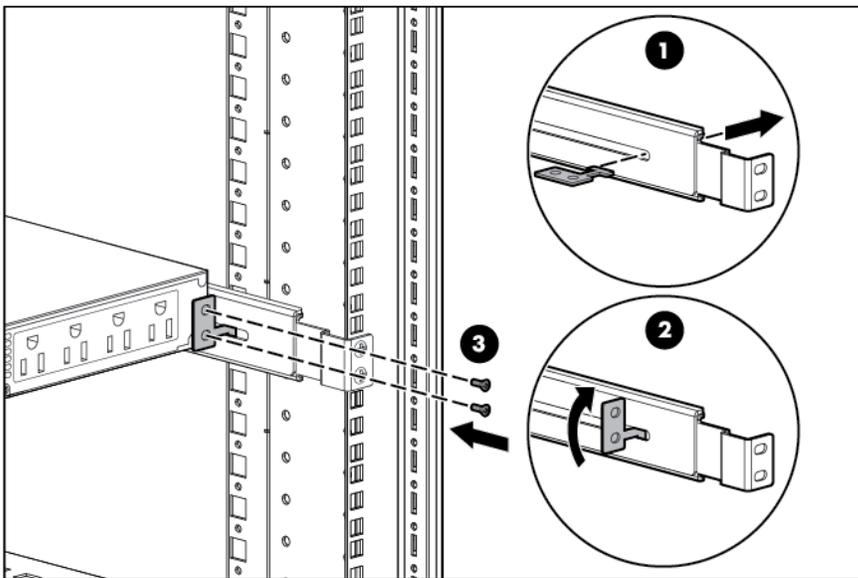
Connecting the batteries

⚠ **WARNING:** The unit contains sealed lead-acid battery modules. To prevent fire or chemical burns:

- Do not attempt to recharge batteries after removal from the unit.
- Do not disassemble, crush, or puncture the batteries.
- Do not short the external contacts of the batteries.
- Do not immerse the batteries in water.
- Do not expose to temperatures higher than 40°C (104°F).

WARNING: To prevent personal injury from hazardous energy:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Do not place tools or metal parts on top of batteries.

IMPORTANT: Before performing the following tasks, be sure that the unit is powered down and disconnected from the utility power source.

NOTE: A small amount of arcing may occur when connecting the batteries. This is normal and does not damage the unit or present any safety concern.

Connect the battery lead to the battery terminal.
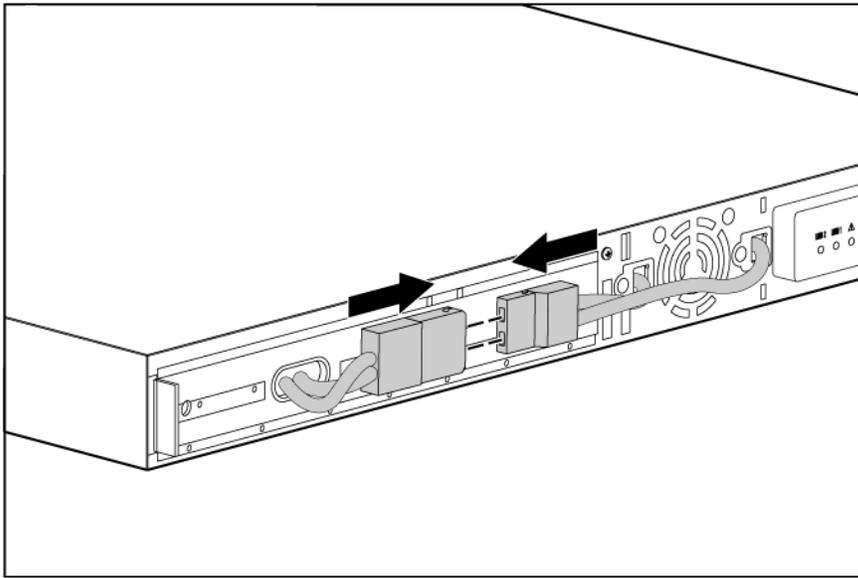
Attaching the UPS front bezel
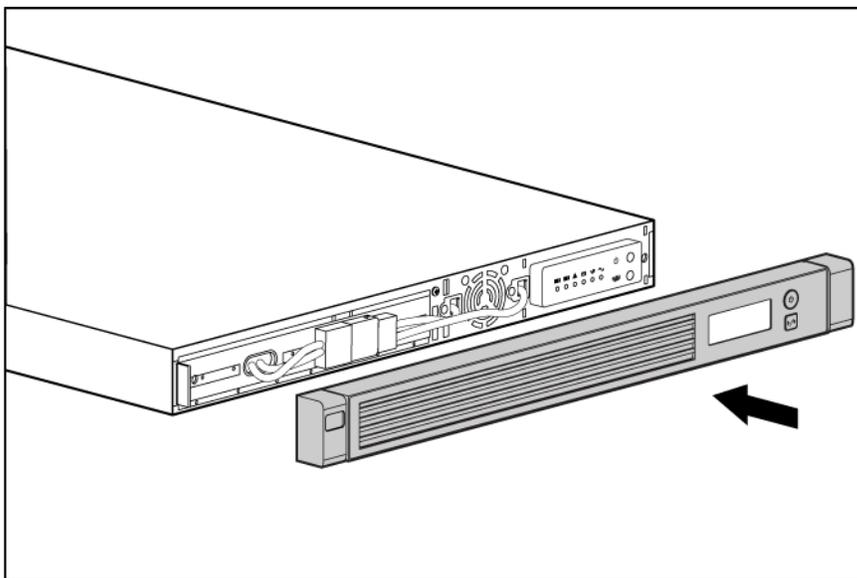
Selecting the UPS voltage configuration

Using a small tool, position the DIP switches according to the desired voltage configuration.
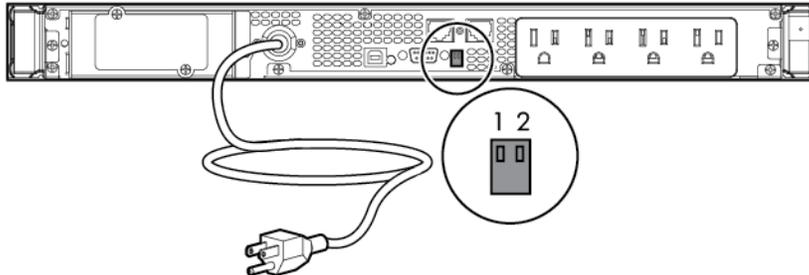
	Output voltage	Output voltage range	DIP switch 1	DIP switch 2
R1500 G3 JPN/TWN	100 V*	90–106 V	Down	Down
	110 V	99–116 V	Down	Up
R1500 G3 NA	110 V	99–116 V	Down	Up
	120 V*	108–127 V	Up	N/A
R1500 G3 INTL	220 V	198–233 V	Down	Up
	230 V*	207–243 V	Up	N/A
	240 V	216–254 V	Down	Down

*Indicates the default setting.

Connecting the host computer

⚠ **CAUTION:** Only one communications port can be connected to the host computer. Connecting more than one will result in unexpected UPS behavior. If an option card is installed, the serial and USB communications ports are automatically disabled.

Connect the UPS to a host computer using either the USB cable or the DB9 serial cable included with the UPS. Install HP Power Protector on the host computer. See the HP website (http://www.hp.com/go/rackandpower) to download the latest version of HP Power Protector.

NOTE: To install and configure the software, see the software user guide. The software user guide is available for download from the HP website (http://www.hp.com/go/rackandpower).

Connecting the serial communications port

⚠ **CAUTION:** Use only the computer interface cable supplied with the UPS to connect the communications port to the host computer.

📝 **IMPORTANT:** Power protector software requires the communications port to be appropriately cabled to the host computer.

CAUTION: Only one communications port can be connected to the host computer. Connecting more than one will result in unexpected UPS behavior. If an option card is installed, the serial and USB communications ports are automatically disabled.
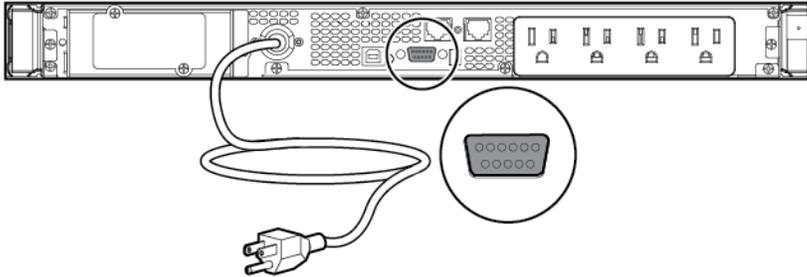
For information about serial port pin assignment, see "Serial communications port pin assignment (on page 35)" .

Connecting the USB communications port
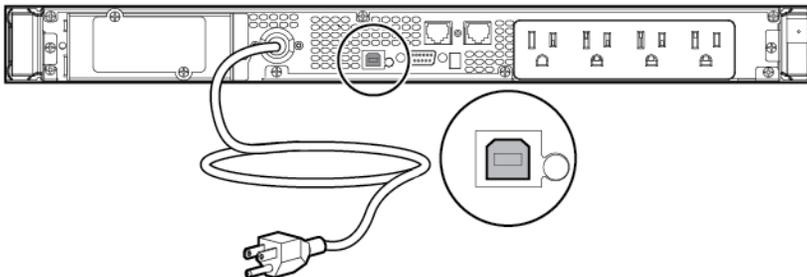
Connecting the Network Transient Protectors

CAUTION: To avoid damaging the equipment, use the Network Transient Protector with a standard telephone line only, not with a digital PBX.

NOTE: Do not connect any telephone or fax/modem equipment (RJ-11) to the 230V models; only connect network cable (RJ-45) to the 230V models.

To protect equipment against surges over a network data line:

1. Connect the network wall jack to the UPS Network Transient Protector IN jack.

2. Connect the equipment to the UPS Network Transient Protector OUT jack.
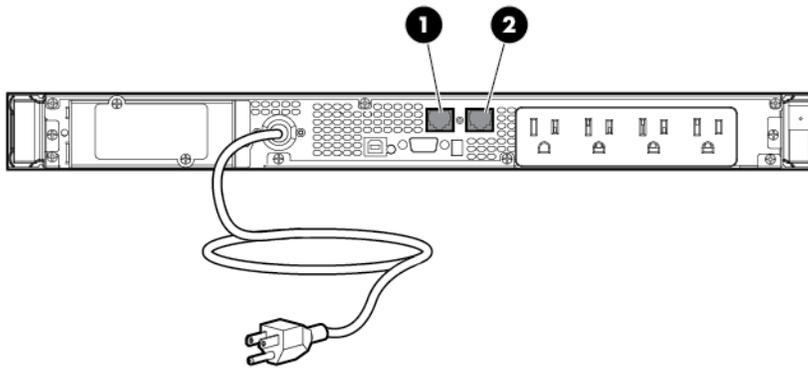
Connecting the UPS to utility power

⚠ **WARNING:** To prevent injury from electric shock or damage to the equipment:
- Plug the input line cord into a grounded (earthed) electrical outlet that is installed near the equipment and is easily accessible.
- Do not disable the grounding plug on the input line cord. The grounding plug is an important safety feature.
- Do not use extension cords.

1. Connect the input power cord to the IEC-320-C14 input power connector on the UPS rear panel (INTL model only).

2. Connect the UPS power cord to a grounded utility power outlet. When the UPS is connected, the batteries begin to charge. Power to the output receptacles designated for surge and battery backup is not available until the unit is powered up.

For more information about receptacle control, see "Power protector software (on page 28)" .

Connecting devices to the UPS

⚠ **CAUTION:** Do not plug laser printers into the UPS output receptacles. The instantaneous current drawn by this type of printer can overload the UPS.

Before connecting devices, verify that the UPS will not overload by checking that the ratings of the devices do not exceed the UPS capacity. If the equipment rating is listed in amps, multiply the number of amps by the selected output voltage to determine the VA.

After verifying that the UPS will not overload:

- Connect the device power cords to the output receptacles on the rear panel of the UPS (NA/JPN/TWN model).

  -or-

- Connect devices to the output receptacles on the rear panel of the UPS using the jumper cords included with the UPS (INTL model).

Charging the UPS batteries

Allow the batteries to charge before putting the UPS into service.

> **IMPORTANT:** Charge the batteries for at least 24 hours before supplying backup power to devices. The batteries charge to:
> - 90% of their capacity within 24 hours
> - 100% of their capacity within 48 hours

Powering up the UPS

Press and hold the Power On/Standby button (1) until the UPS beeps. The Power On, Load 1 and Load 2 LEDs illuminate, indicating that power is available at the UPS output receptacles.
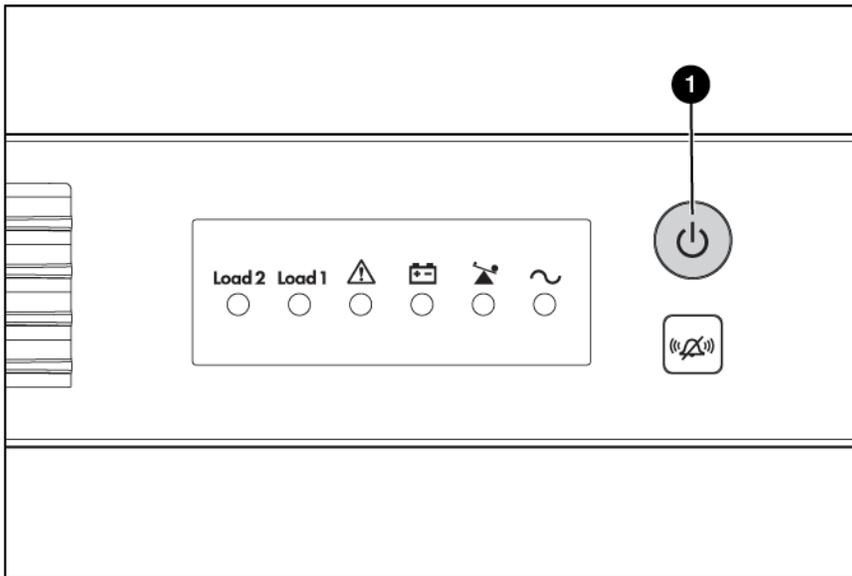
Installing the optional UPS Network Module

> **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 then remove the cover plate.
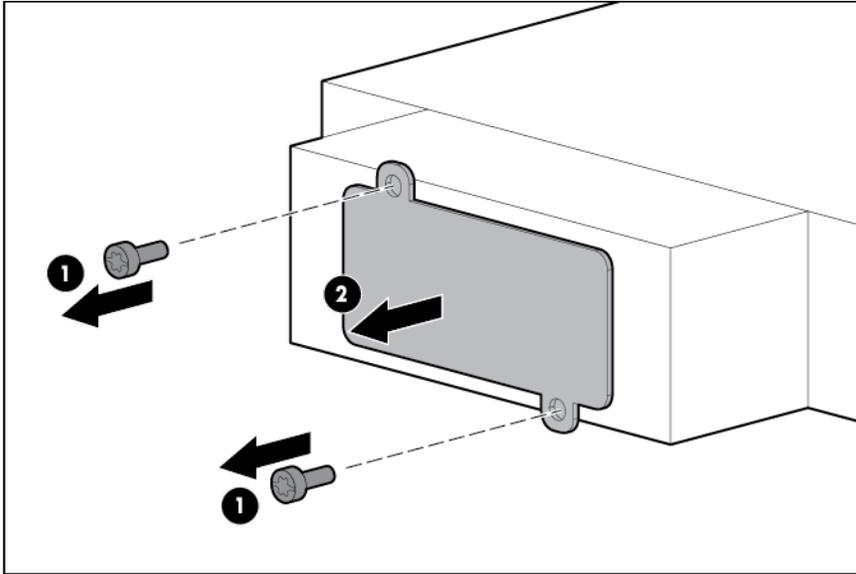
2. Install the UPS Network Module along the alignment channels in the option slot.
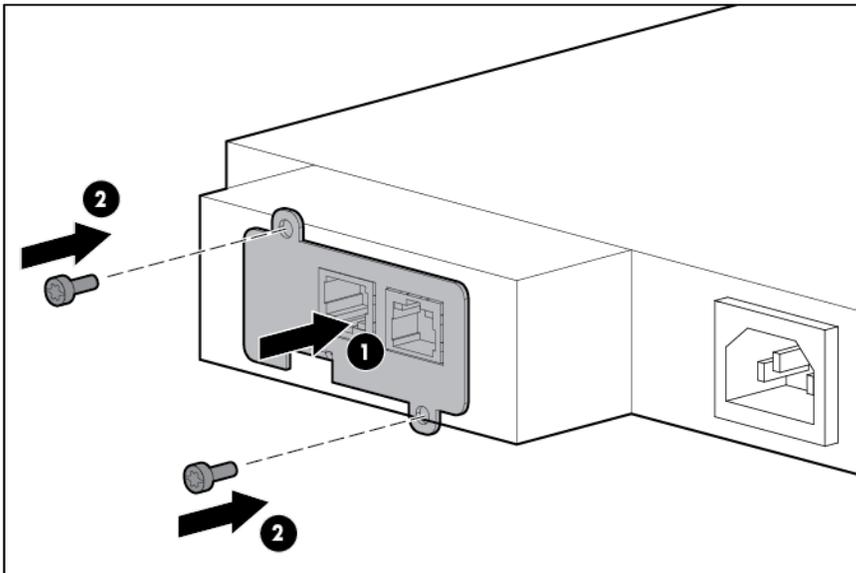
3. Secure the UPS Network Module using the two screws removed in step 1.

4. 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.
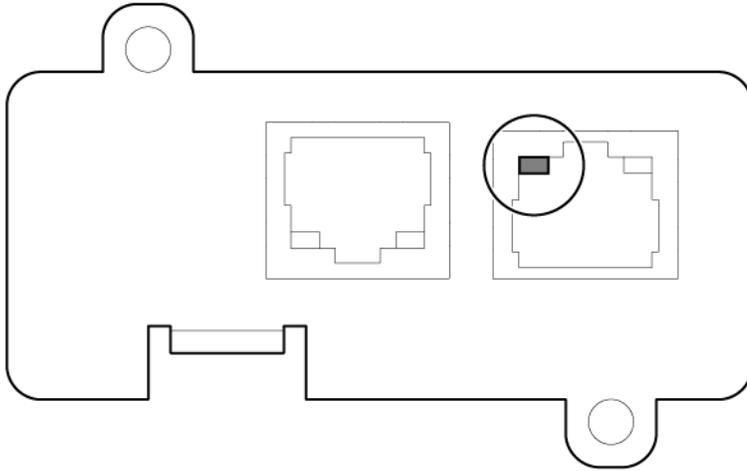
Connecting the UPS Network Module

The UPS Network Module card is provided to manage the attached servers. RJ 45 network patch panel cables are required to use this card.

The RJ 45 network patch panel cables are not included.
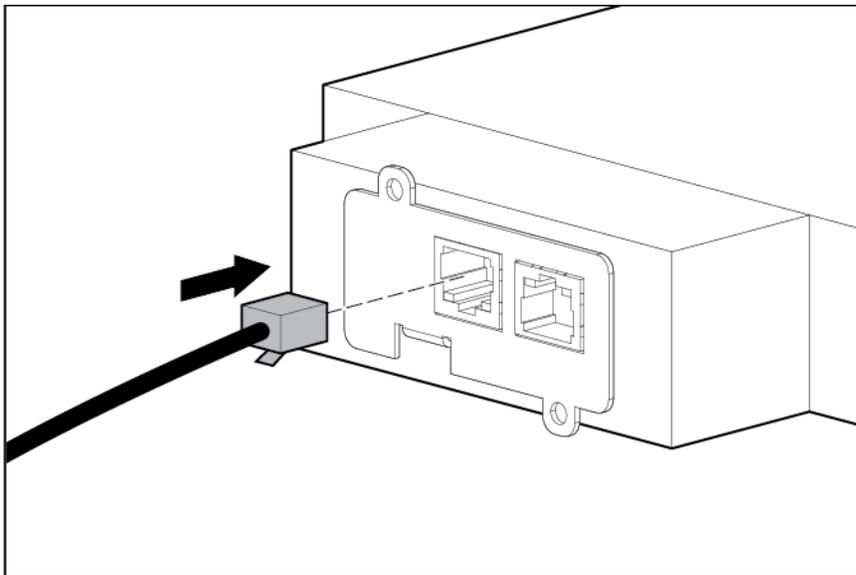
UPS operations

Modes of operation

The UPS has two modes of operation:

- Operate mode (on page 19)
- Battery mode (on page 19)

Operate mode

In Operate mode:

- Power is available at the UPS receptacles.
- The UPS charges the batteries as necessary.

The UPS can be placed in Operate mode if either of the following conditions applies:

- The UPS is powered up.
- The UPS is powered down and no utility power is available.

To place the UPS in Operate mode, press and hold the Power On/Standby button ("UPS front panel controls" on page 6) until the UPS acknowledges compliance with a short beep. The Power On, Load 1 and Load 2 LEDs ("UPS front panel LED indicators" on page 6) illuminate, indicating that power is available at the UPS output receptacles.

Battery mode

In Battery mode, the UPS supplies power without being connected to utility power.

To power up the UPS without using utility power, press and hold the Power On/Standby button ("UPS front panel controls" on page 6) for two seconds.

Initiating a self-test

To initiate a self-test, press and hold the Test/Alarm Reset button ("UPS front panel controls" on page 6) for three seconds.

Because a portion of the self-test requires battery power, the self-test cannot be initiated if the batteries are less than 90 percent charged. If the UPS detects a problem, the appropriate LED ("UPS front panel LED indicators" on page 6) illuminates and an audible alarm may sound.

For information on what to do if the self-test detects a problem, see "Troubleshooting (on page 30)."

Silencing an audible alarm

To silence an alarm, press the Test/Alarm Reset button ("UPS front panel controls" on page 6).

> **📝 IMPORTANT:**
> - Although the audible alarm silences, the condition that caused the alarm to sound might still exist.
> - If a utility power failure caused the alarm (or the General Alarm LED illuminates yellow), the alarm silences after power is restored.

For information about audible alarm conditions, see "LED and audible alarm troubleshooting (on page 30)."

Powering down the UPS

1. Shut down all connected load devices.
2. Press the Power On/Standby button. Power to the output receptacles ceases.
3. Disconnect the UPS from utility power.
4. Wait at least 60 seconds for the UPS internal circuitry to discharge.

Maintenance

Removing the UPS front bezel
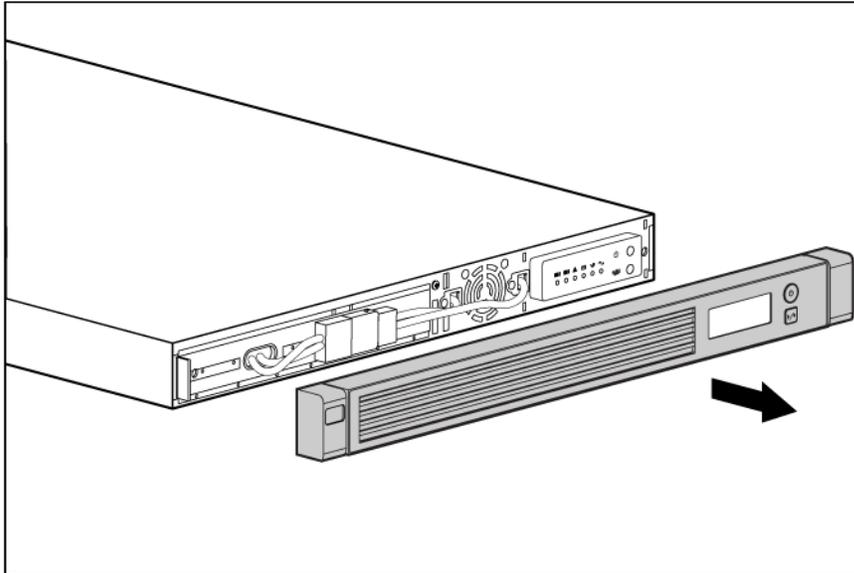
Replacing the batteries

To replace the batteries:

1. Read and observe the requirements in "Important battery safety information (on page 21)" and "Battery care and storage guidelines (on page 22)."
2. Follow the instructions in "UPS battery replacement procedure (on page 22)."

Important battery safety information

⚠ **WARNING:** The unit contains sealed lead-acid battery modules. To prevent fire or chemical burns:

- Do not attempt to recharge batteries after removal from the unit.
- Do not disassemble, crush, or puncture the batteries.
- Do not short the external contacts of the batteries.
- Do not immerse the batteries in water.
- Do not expose to temperatures higher than 60°C (140°F).

⚠ **WARNING:** To prevent personal injury from hazardous energy:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Do not place tools or metal parts on top of batteries.

NOTE: Replace all battery modules at the same time.

Battery care and storage guidelines

⚠ **CAUTION:** Because of the short shelf life of the batteries, avoid storing a battery spare as a backup. Do not maintain an inventory of spare batteries on site unless a procedure to keep these batteries charged while in storage is implemented.

To maintain the batteries:

- Minimize the amount of time the UPS uses battery power by matching the UPS configuration with the utility voltage. See "Selecting the UPS voltage configuration (on page 13)."
- Keep the area around the UPS clean and dust-free. If the environment is very dusty, clean the outside of the UPS regularly with a vacuum cleaner.
- Maintain the ambient temperature at 25°C (77°F).
- If storing a UPS for an extended period, recharge the batteries every 6 months, and then update the battery recharge date label.

UPS battery replacement procedure

This component is hot-swappable and can be replaced without powering down the UPS.

1. (optional) To replace the component with the UPS powered down, refer to "Powering down the UPS (on page 20)."
2. Remove the UPS front bezel ("Removing the UPS front bezel" on page 21).
3. Disconnect the battery leads.
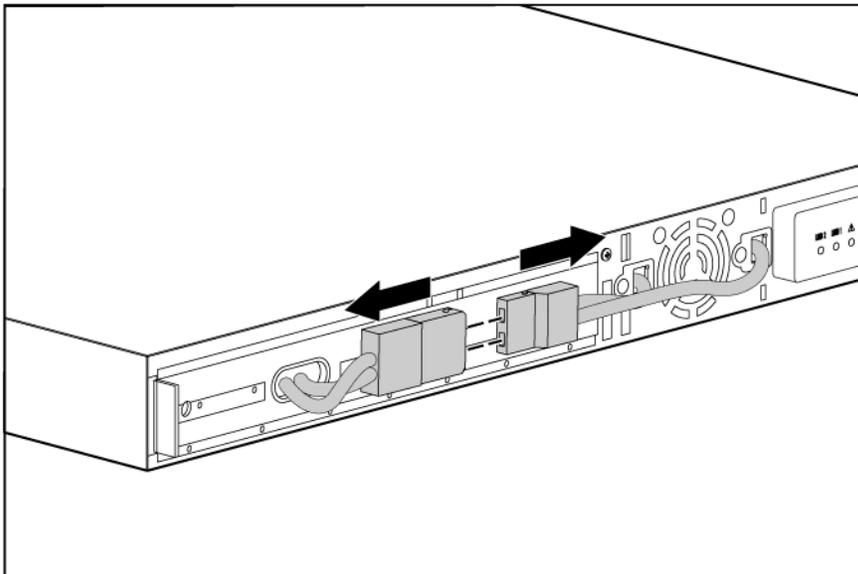
4. Remove the battery bracket.
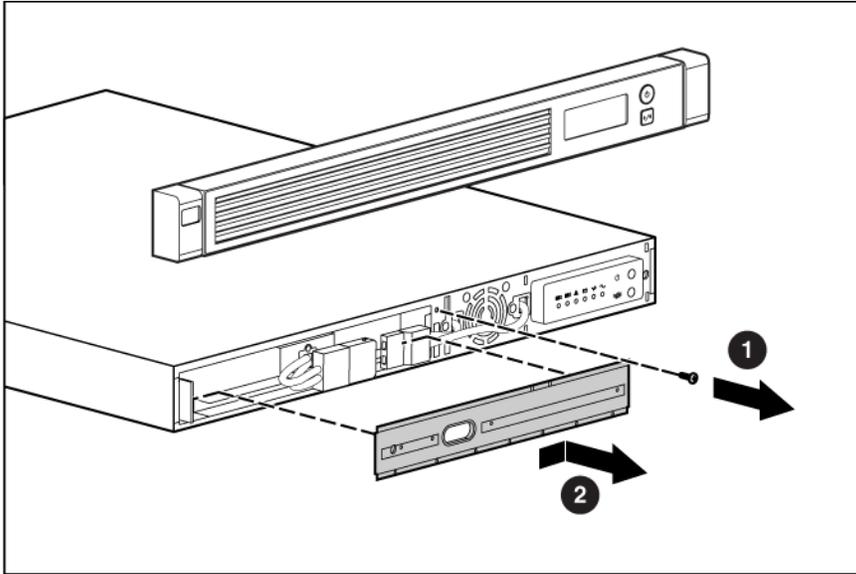
5. Remove the UPS battery modules.

📝 **IMPORTANT:** Do not pull the battery leads when removing or installing the batteries.
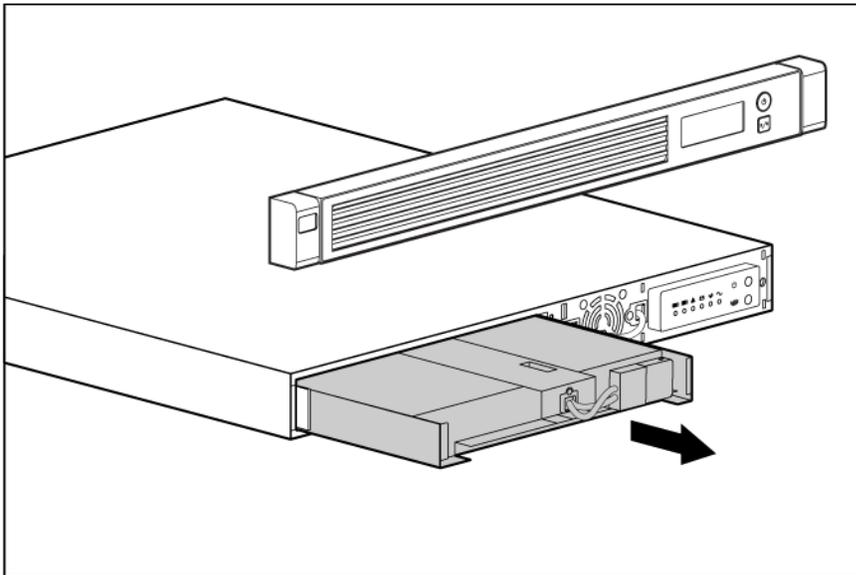
To replace the component, reverse the removal procedure.

📝 **IMPORTANT:** Charge the batteries for at least 24 hours before supplying backup power to devices. The batteries charge to:
- 90% of their capacity within 24 hours
- 100% of their capacity within 48 hours

Testing the new battery module

After installing the new battery module, press the Test/Alarm Reset button. For information on initiating a self-test, see "Initiating a self-test (on page 19)."

IMPORTANT: The UPS does not execute a self-test until the batteries are 90 percent charged.

If the installation has been successful, the UPS enters Operate mode. If the installation has not been successful, the alarm beeps, the On Battery LED illuminates, and the General Alarm LED flashes. If this occurs, repeat the procedures in "Replacing the batteries (on page 21)," and check the battery terminal connections. If the condition persists, see "Troubleshooting (on page 30)."

IMPORTANT: Charge the batteries for at least 24 hours before supplying backup power to devices. The batteries charge to:
- 90% of their capacity within 24 hours
- 100% of their capacity within 48 hours

Replacing the UPS

To remove the UPS:

1. Power down all attached load devices.
2. Power down the UPS ("Powering down the UPS" on page 20).
3. Unplug the UPS power cord.
4. Disconnect the communications cable.
5. Unplug the load devices.
6. Remove the UPS front bezel ("Removing the UPS front bezel" on page 21).
7. Remove the UPS battery bracket.
8. Remove the UPS battery modules.
9. Remove the screws securing the UPS to the rack.
10. Remove the UPS from the rack.

To replace the component, reverse the removal procedure.

Replacing the UPS option card

This component is hot-swappable and can be replaced without powering down the UPS.

1. (optional) To replace the component with the UPS powered down, refer to "Powering down the UPS (on page 20)."

2. Remove the two screws securing the option card, and then slide the card out.
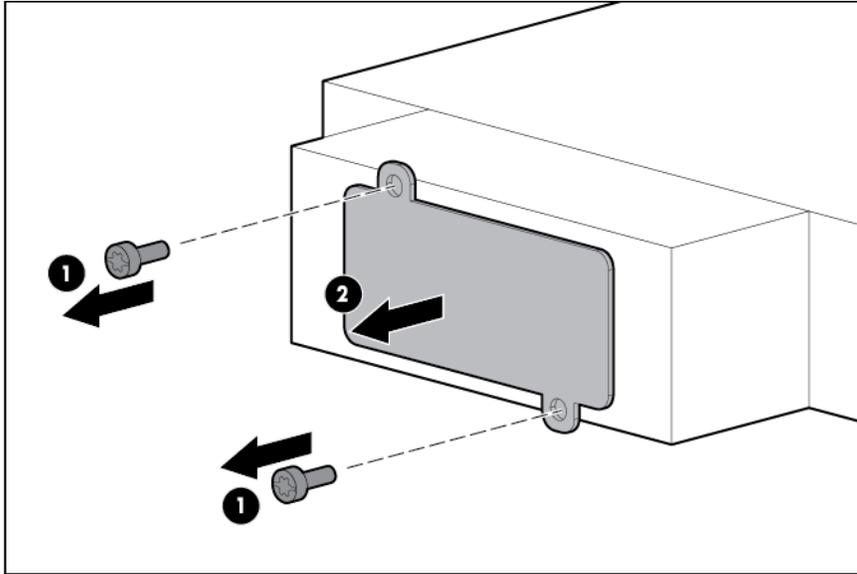
To replace the component, reverse the removal procedure.

⚠ **CAUTION:** Only one communications port can be connected to the host computer. Connecting more than one will result in unexpected UPS behavior. If an option card is installed, the serial and USB communications ports are automatically disabled.

NOTE: Replacing the option card might require power protector software to be restarted or reconfigured.

Updating the UPS firmware

To update the UPS firmware, see the HP website (http://www.hp.com/go/rackandpower).

Configuring a USB to serial converter

NOTE: This procedure was tested on the Windows® XP Professional, Windows Server® 2003, and Windows® Vista Enterprise operating systems using the HP USB to serial converter (part number 304098-001). Depending on your system configuration, a driver download might be required to successfully install the converter. The driver can be downloaded from the USB-Drivers website (http://www.usb-drivers.com/drivers/123/123294.htm).

To configure a USB port to the COM 1 port on systems that do not have available serial ports:

1. Connect the USB to serial converter to the USB port on your system.

2. For Windows Vista, click **Start**, select **Control Panel**, double-click **System and Maintenance**, and then skip to step 4.

   -or-

   For Windows XP, click **Start**, select **Control Panel**, click **Performance and Maintenance**, and then click **System**.

   -or-

For Windows Server, click **Start**, select **Control Panel**, and then double-click **System**.

3. Click the **Hardware** tab.
4. Click **Device Manager**. The Device Manager screen appears.
5. In the tree displayed in the left panel, click the **Ports (COM & LPT)** branch to expand.
6. Double-click the port that is assigned to your USB to serial converter device. This port is usually named with the device manufacturer's name followed by one of the following:
   o USB to Serial Bridge (COM 4)
   o USB Serial port
   o Communications Port (COM1)

   The Port Properties screen appears.
7. Click the **Port Settings** tab. The Port Settings screen appears.
8. Click **Restore Defaults**. The following default settings appear:
   o Bits per second: 9600
   o Data Bits: 8
   o Parity: None
   o Stop bits: 1
   o Flow control: None
9. Click **Advanced**. The Advanced Settings screen appears.
10. From the COM Port Number drop down menu, select **Com 1** for the USB port number, and then click **OK**.

    If COM 1 is being used by another USB port, the following message appears:

    ```
    This COM name is being used by another device. Using duplicate names can lead
    to inaccessible devices and changed settings. Do you want to continue?
    ```

    If this message appears, click **YES**. It might be necessary to disable the program accessing COM 1.
    a. Click **OK**.
    b. For Windows Vista, skip to step 13.
11. For Windows Server, reduce the Receive Buffer and Transmit Buffer to the low setting by scrolling down to select **low (1)**.
12. Be sure that the **Use FIFO buffers (requires 16550 compatible UART)** checkbox is selected.

    For Windows XP, the USB settings might be different. Choose the lowest, most dependable Receive and Transmit buffers by using the list menus, radio buttons, or other selection methods.
13. Click **OK** to close the Advanced screen.
14. Click **OK** to close the Device Manager screen.
15. Run the firmware Flash batch file program. Follow the instructions provided with the program.

Reassigning the USB COM ports

To reassign a device from COM 1 to another port:

1. From the open Device Manager screen, locate the USB device that is assigned to COM 1.
2. Double-click the port name.

   The Port Properties screen appears.

3. Click the **Port Settings** tab.

   The Port Settings screen appears.

4. Click **Advanced**.

   The Advanced Settings screen appears.

5. Select an available USB port number from the **COM Port Number** drop down menu.

6. Click **OK** to close the Advanced screen.

7. Click **OK** to close the Port Settings screen.

8. Verify that the Device Manager screen shows that the USB to serial converter is assigned to COM 1, and that the other USB device is assigned to a different port.

   If the Device Manager screen does not automatically refresh to show the change:

   a. Click **Action**.

      The Action Menu appears.

   b. Click **Scan for hardware changes** to refresh the screen and display the changes.

Power management

Power Protector software

HP Power Protector software ensures maximum power reliability of computer systems through comprehensive control of UPSs. The easy-to-use browser interface enables novice users to configure and manage power protection settings. To download the latest version of HP Power Protector software, see the HP website (http://www.hp.com/go/rackandpower).

> **NOTE:** To install and configure the software, see the software user guide. The software user guide is available for download from the HP website (http://www.hp.com/go/rackandpower).

HP Power Protector:

- Does not require complex management systems, which simplifies deployment, configuration, and management of UPS-protected environments.

- Manages a graceful shutdown of attached devices during utility power failures.

- Prioritize the shutdown timing of attached computers.

- Customizes alert generation with modifiable dialog boxes, command execution, and email and broadcast messages.

- Monitors the status of the UPS and reports alarms.

- Displays a power log for analysis.

- Manages independent UPS load segments to provide separate power control of attached load devices.

The HP UPS Network Module (P/N AF465A) is a Minislot with an easy-to-use browser interface, which gives you comprehensive control of the UPS and enables you to monitor and effectively manage power environments. The UPS Network Module supports either a single UPS configuration or a dual redundant UPS configuration for no single-point-of-failure.

The UPS Network Module can be configured to send alert traps to HP Systems Insight Manager and other SNMP management programs or used as a stand-alone management system. This flexibility enables you to monitor and manage UPSs through the network. To facilitate day-by-day maintenance tasks, the embedded management software provides detailed system logs.

The UPS Network Module provides remote management of a UPS by connecting the UPS directly to the network. Configuration and management of the UPS from anywhere and at any time through a standard web browser.

The UPS Network Module (Minislot) is ideal for:

- Small to enterprise-sized customers that will benefit from remotely managing their UPS.

- Adding protection via the redundant UPS configuration.

- Gracefully performing scheduled shut-downs of attached equipment.

- Notifying administrative personnel in the event of a power failure.

- Prioritizes the timing of attached load device shutdowns.

- Delays reboot by load segment after a power outage to sequence the startup of system components.

Troubleshooting

LED and audible alarm troubleshooting

Condition	Power On LED (green)	On Battery LED (yellow)	Overload LED (red)	General Alarm LED (red)	Audible alarm	Can alarm be silenced ("Silencing an audible alarm" on page 19)?
UPS operating from utility	On	Off	Off	Off	No audible alarm	N/A
Buck mode (high input voltage)	On	Off	Off	Off	No audible alarm	N/A
Boost mode (low input voltage)	On	Off	Off	Off	No audible alarm	N/A
Over temperature condition	On	On	Off	Flashing	On—Continuous	No
Battery test failure	Off	On	Off	Flashing	On—Continuous	Yes
Fan failure	On	Off	Off	Flashing	On—Continuous	No
Output short circuit	On	On	On	Flashing	On—Continuous	No
Power up failure from a DC start—Low battery (no utility power)	Flashing	Flashing	Flashing	Flashing	On—3 beeps/10 seconds	No
Low battery (no utility power)	Off	On	Off	Off	On—2 second beep	No
Online—UPS power capacity exceeded	On	Off	On	Off	On—1 second beep	No
Overload timeout	Off	Off	On	Flashing	On—Continuous	No
On battery—Input voltage is out of range	On	On	Off	Off	On—2 second beep	Yes
On battery—No utility power	Off	On	Off	Off	On— 4 second beep	Yes
On battery—Battery voltage condition	Flashing	Off	Off	Flashing	On—Continuous	Yes
On battery—Overload condition	Off	On	On	Off	On—1 second beep	No
On battery—Output voltage is out of range	Off	Flashing	Off	Flashing	On—Continuous	No
On battery—Output wave is abnormal	Flashing	Flashing	Off	Flashing	On—Continuous	No

> ⚠ **CAUTION:** Only one communications port can be connected to the host computer. Connecting more than one will result in unexpected UPS behavior. If an option card is installed, the serial and USB communications ports are automatically disabled.

For the location of individual LEDs, see "UPS front panel LED indicators (on page 6)."

UPS does not start

Action:

1. Be sure that the power cord is plugged in to a utility power receptacle.
2. Check the power source at the utility power receptacle.
3. Allow the UPS batteries to charge for 24 hours.

UPS operates on battery only

Action:

1. Save your work.
2. Power down the load devices connected to the UPS output receptacles.
3. Remove one or more load devices to reduce the power requirements.
4. Be sure the UPS configuration matches the utility voltage. Refer to "Selecting the UPS voltage configuration (on page 13)."

UPS frequently switches between utility and battery power

Action:

1. Check the input voltage and reconfigure the UPS.
2. Contact a qualified electrician to verify that the utility power is suitable for the UPS.

UPS does not provide the expected backup time

Action:

1. If the Overload LED is illuminated, remove one or more load devices to reduce the power requirements.
2. Power down the UPS ("Powering down the UPS" on page 20).
3. Verify the batteries are connected.
4. Allow the UPS batteries to charge for 24 hours.
5. Initiate a self-test ("Initiating a self-test" on page 19).
6. During extended power outages, save your work, power down the load devices, and then power down the UPS ("Powering down the UPS" on page 20) to conserve battery power.

UPS cannot communicate with the host computer

Action:

- Verify only one communications port is connected to the host computer ("Connecting the host computer" on page 13).

- If an option card is installed, verify the host computer is only connected to the option card. Installing an option card automatically disables the built-in serial and USB communications ports.

UPS emits a slight clicking noise

Action: The UPS is automatically correcting high or low AC voltage on the utility line. No action is required.

Site wiring condition

Action: Contact a qualified electrician to be sure that:

- The line and neutral wires are not reversed in the wall outlet.

- A ground wire connection does not exist.

Specifications

UPS physical specifications

Parameter	Value
Height	4.5 cm (1.75 in)
Depth	61.21 cm (24.10 in)
Width	44.45 cm (17.5 in)
Weight	23 kg (50.5 lb)

UPS input specifications

NOTE: An asterisk (*) indicates the default setting.

UPS model	Utility voltage frequency (auto-sensing)	Available settings utility voltage ("Selecting the UPS voltage configuration" on page 13) (VAC)	Branch circuit rating (A)	Line cord
R1500 G3 NA	50/60 Hz	110, 120*	15 or 20	Power cord with NEMA 5-15 plug
R1500 G3 JPN/TWN	50/60 Hz	100*, 110	15 or 20	Power cord with NEMA 5-15 plug (BSMI approved for TWN)
R1500 G3 INTL	50/60 Hz	220, 230*, 240	16	IEC-320-C14 power inlet

UPS output specifications

UPS model	Output receptacles
R1500 G3 NA/JPN/TWN	4 x NEMA 5-15
R1500 G3 INTL	4 x IEC-320-C13

Power protection specifications

UPS model	VA	Nominal power rating (W)	Nominal voltage setting
R1500 G3 NA	1440	1000	110, 120
R1500 G3 JPN/TWN	1200	900	100
	1320	1000	110

UPS model	VA	Nominal power rating (W)	Nominal voltage setting
R1500 G3 INTL	1500	1000	220, 230, 240

Voltage specifications

Configuration setting (VAC)	Available nominal output voltage (VAC)
100	100
110	110
120	120
220	220
230	230
240	240

Output tolerance specifications

Source of power	Regulation
Utility power (nominal range)	-10% to +6% of nominal output voltage rating (within the guidelines of the Computer Business Equipment Manufacturers Association)
Battery power	±5% of nominal output voltage rating

Output feature specifications

Feature	Specification
Online efficiency	95% nominal input voltage
Voltage wave shape	Sine wave; 5% THD with typical PFC load
Surge suppression	ANSI C62.41 Category A (formerly IEEE 587)
Noise filtering	Full-time EMI/RFI filtering

Battery specifications

Feature	Specification
Type	6 V, 9 AH, sealed, maintenance-free, valve-regulated, rechargeable, lead-acid battery.
Voltage	The battery modules have a battery string voltage of 36 V.
Charging	Advanced charging for faster recovery. Complete charge takes at least 48 hours. After approximately 24 hours, the batteries reach 90% charge at default nominal utility voltage and no load.

IMPORTANT: The 48-hour timer for the overall charge cycle triggers at the transition from charge mode to float mode. For certain conditions such as heavily discharged batteries, battery condition, and so on, it may take longer than usual to reach float mode. In these cases, it may take longer than 48 hours to reach the rest mode.

Battery runtime

Load, percent	Load, watts	Estimated battery runtime at 100% battery charge
20	200	58 minutes
50	500	17 minutes
80	800	8 minutes
100	1000	5 minutes

Environmental specifications

Feature	Specification
Operating temperature	0°C to 35°C (32°F to 95°F)
Nonoperating temperature	-15°C to 55°C (5°F to 131°F)
Relative humidity	5% to 95%; noncondensing
Operating altitude	Up to 3,000 m (9,843 ft) above sea level
Nonoperating altitude	Up to 15,000 m (49,212 ft) above sea level
Audible noise	Less than 45 dBA

Serial communications port pin assignment
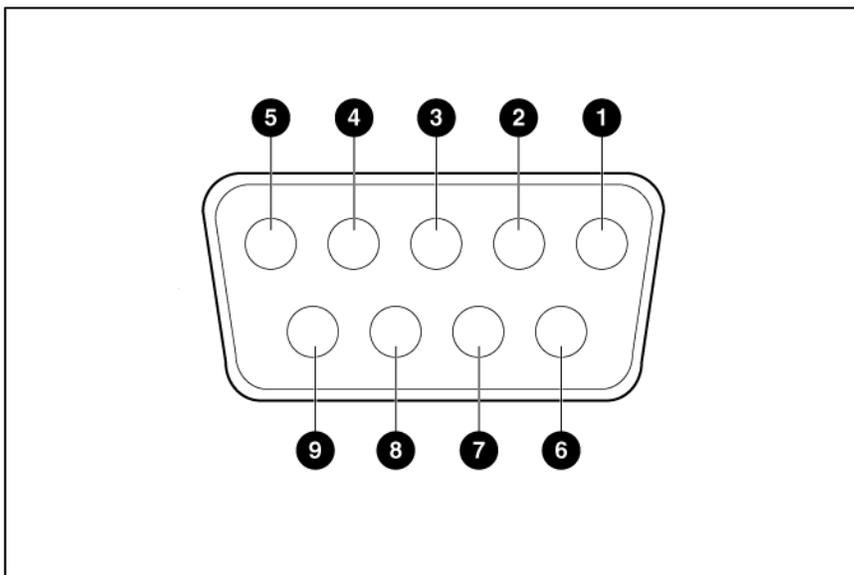
Pin number	Signal name	Function	Direction from the UPS
1	Low batt	Low battery relay contact; 20 mA, 30 Vdc contact rating	Out
2	TxD	Transmit to external device	Out
3	RxD	Receive from external device	In
4	DTR	PnP from external device (tied to Pin 6)	In

Pin number	Signal name	Function	Direction from the UPS
5	GND	Signal common (tied to chassis)	—
6	DSR	To external device (tied to Pin 4)	Out
7	—	No connection	—
8	AC fail	AC fail relay contact; 20 mA, 30 Vdc contact rating	Out
9	—	No connection	—

Spares

Ordering spares

To order a spare, visit the HP website (http://www.hp.com/buy/parts).

To replace parts under warranty, contact an HP authorized service representative.

UPS spare parts list

Item	Spare part number
UPS unit NA	638837-001
UPS unit JPN/TWN	638838-001
UPS unit INTL	638839-001
Battery	418401-001

Hardware options

For information on the supported hardware options, see the HP website (http://www.hp.com/go/rackandpower).

Support and other resources

Before you contact HP

Be sure to have the following information available before you call HP:

- Active Health System log (HP ProLiant Gen8 or later products)

    Download and have available an Active Health System log for 7 days before the failure was detected. For more information, see the *HP iLO 4 User Guide* or *HP Intelligent Provisioning User Guide* on the HP website (http://www.hp.com/go/ilo/docs).

- Onboard Administrator SHOW ALL report (for HP BladeSystem products only)

    For more information on obtaining the Onboard Administrator SHOW ALL report, see the HP website (http://www.hp.com/go/OAlog).

- Technical support registration number (if applicable)

- Product serial number

- Product model name and number

- Product identification number

- Applicable error messages

- Add-on boards or hardware

- Third-party hardware or software

- Operating system type and revision level

HP contact information

For United States and worldwide contact information, see the Contact HP website (http://www.hp.com/go/assistance).

In the United States:

- To contact HP by phone, call 1-800-334-5144. For continuous quality improvement, calls may be recorded or monitored.

- If you have purchased a Care Pack (service upgrade), see the Support & Drivers website (http://www8.hp.com/us/en/support-drivers.html). If the problem cannot be resolved at the website, call 1-800-633-3600. For more information about Care Packs, see the HP website (http://pro-aq-sama.houston.hp.com/services/cache/10950-0-0-225-121.html).

Regulatory information

Safety and regulatory compliance

For safety, environmental, and regulatory information, see *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the HP website (http://www.hp.com/support/Safety-Compliance-EnterpriseProducts).

Turkey RoHS material content declaration

Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur

Ukraine RoHS material content declaration

Обладнання відповідає вимогам Технічного регламенту щодо обмеження використання деяких небезпечних речовин в електричному та електронному обладнанні, затвердженого постановою Кабінету Міністрів України від 3 грудня 2008 № 1057

Warranty information

HP ProLiant and X86 Servers and Options (http://www.hp.com/support/ProLiantServers-Warranties)

HP Enterprise Servers (http://www.hp.com/support/EnterpriseServers-Warranties)

HP Storage Products (http://www.hp.com/support/Storage-Warranties)

HP Networking Products (http://www.hp.com/support/Networking-Warranties)

Electrostatic discharge

Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding methods to prevent electrostatic discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ±10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact an authorized reseller.

Acronyms and abbreviations

IEC

International Electrotechnical Commission

PFC

power factor corrected

PnP

plug and play

UPS

uninterruptible power system

USB

universal serial bus

Documentation feedback

HP 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@hp.com). Include the document title and part number, version number, or the URL when submitting your feedback.

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