

## IBM 1000VA and 1500VA LCD Tower UPS

### IBM System x at-a-glance guide

The IBM 1000VA and 1500VA LCD Tower Uninterruptible Power Supply (UPS) offerings provide power protection with increased efficiency and simplified power management to safeguard high-availability IBM System x server environments. With efficiency ratings of 95% or greater, these compact tower designs can help reduce energy usage without compromising performance or reliability.

The IBM LCD Tower UPS is shown in Figure 1.



Figure 1. IBM LCD Tower Uninterruptible Power Supply

### Did You Know?

The IBM 1000VA and 1500VA LCD Tower UPS offerings have a bright, easily customizable, and graphical LCD display that lets you configure the device and displays important UPS status information in one of nine languages.

These units can also enhance system availability with intelligent individual receptacle groups or load segments that can be programmed and controlled, allowing mission-critical devices to be prioritized during shutdown to preserve battery run time in the event of a prolonged power outage.

Additionally, these units come equipped with a communication bay that allows the installation of an optional network management card (46M4110). The network management card provides convenient over-the-network UPS remote monitoring and management through a standard web browser. This solution features advanced capabilities, such as secure, remote flash upgradeable firmware for both the UPS and network management card, which makes it an ideal solution for remote locations.

## About uninterruptible power supplies

An uninterruptible power supply (UPS) is a device that acts as a defensive barrier between electronic equipment and incoming power problems. It conditions, regulates, and filters out power disturbances to ensure a clean power source for IT equipment. A UPS also provides battery backup in the event of a power failure.

In today's high availability server environments, unplanned power outages or line quality irregularities can have a considerable financial impact on all sized businesses. The typical utility power is 99.9% available, but that means that there can be almost 9 hours of downtime a year, not to mention brownouts and other power quality problems.

Selecting the right IBM UPS can help protect against these potentially costly incidents.

## Part number information

Table 1 shows the orderable part numbers and feature codes for the IBM 1000VA and 1500VA LCD Tower UPS offerings.

Table 1. Ordering part numbers and feature codes

Description	Part number	Feature code
IBM 1000VA LCD Tower UPS (100 V)	53961JX	6664
IBM 1000VA LCD Tower UPS (120 V)	53961AX	6663
IBM 1000VA LCD Tower UPS (230 V)	53961KX	6665
IBM 1500VA LCD Tower UPS (100 V)	53962JX	6667
IBM 1500VA LCD Tower UPS (120 V)	53962AX	6666
IBM 1500VA LCD Tower UPS (230 V)	53962KX	6668
IBM LCD UPS Network Management Card (optional)	46M4110	6145
IBM LCD UPS Environmental Monitoring Probe (optional)	46M4113	6146

The UPS models include the following items:

- An accessory kit, containing the following items:
  - Serial cable (3.7 m (12 ft))
  - USB cable
  - Remote emergency power-off (REPO) connector
- A documentation kit, containing the following items:
  - Warranty flyer
  - Important Notices Manual
  - Documentation CD
  - Software CD, which contains IBM UPS Manager power management software

The 100 V and 120 V models (1AX, 2AX, 1JX, and 2JX) ship with detachable line cords, as listed in Table 2.

Table 2. Supplied line cords

Description	Part number	Supplied line cord
IBM 1000VA LCD Tower UPS (100 V)	53961JX	IEC 320 C13 to JIS C-8303 2.8 m
IBM 1000VA LCD Tower UPS (120 V)	53961AX	IEC 320 C13 to NEMA 5-15P 2.8 m
IBM 1000VA LCD Tower UPS (230 V)	53961KX	None (see Table 3.)
IBM 1500VA LCD Tower UPS (100 V)	53962JX	IEC 320 C19 to JIS C-8303 2.5 meters
IBM 1500VA LCD Tower UPS (120 V)	53962AX	IEC 320 C13 to NEMA 5-15P 2.8 meters
IBM 1500VA LCD Tower UPS (230 V)	53962KX	None (see Table 3.)

The 230 V models (1KX and 2KX) do not ship with line cords. Table 3 lists the compatible 230 V line cords from IBM, which are suitable for models 53961KX and 2KX; however, other customer ordered line cords can be used.

Table 3. Line cords for 230 V models (models 53961KX and 2KX)

<b>230V line cords - 2.8 m line cords</b>	<b>Part number</b>
European 10A line C13 to CEE 7/7 (2.8 m)	39Y7917
Denmark 10A line C13 to DK2-5A (2.8 m)	39Y7918
Switzerland 10A line C13 to SEV 1011 (2.8 m)	39Y7919
Israel 10A line C13 to SI 32 (2.8 m)	39Y7920
Italy 10A line C13 to CEE 7/7 (2.8 m)	39Y7921
South Africa 10A line C13 to SABS 164/1 (2.8 m)	39Y7922
United Kingdom 10A line C13 to BS 1363 (2.8 m)	39Y7923
Australia/NZ 10A line C13 to SAA-AS C112 (2.8 m)	39Y7924
Korea 7A line C13 to KETI 15A/250 V (2.8 m)	39Y7925
India 6A line C13 to Fig 68 (2.8 m)	39Y7927
China 6A line C13 to GB 2099.1 (2.8 m)	39Y7928
Taiwan 10A/125 V C13/CNS 10917 (2.8 m)	81Y2374
Taiwan 10A/250 V C13/CNS 10917 (2.8 m)	81Y2375
Brazil 10A/250 V C13 to NBR 14136 (2.8 m)	69Y1988
Argentina 10A line C13 to IRAM 2063 (2.8 m)	39Y7930
<b>230V line cords - 4.3 m line cords</b>	<b>Part number</b>
Europe 10A/250 V C13 / CEE 7/7 (4.3 m)	81Y2376
United Kingdom 10A/250 V C13 / BS 1363A (4.3 m)	81Y2377
China 10A/250 V C13 / GB2099.1 (4.3 m)	81Y2378
South Africa 10A/250 V C13/ SANS 164-1 (4.3 m)	81Y2379
Italy 10A/250 V C13/ CEI 23-16 (4.3 m)	81Y2380
Israel 10A/250 V C13/ SI 32 (4.3 m)	81Y2381
Denmark 10A/250 V C13/SB107-2-DI (4.3 m)	81Y2382
Australia 10A/250 V C13/ AS/NZS 3112/2000 (4.3 m)	81Y2383
Argentina 10A/250 V C13/ IRAM 2073 (4.3 m)	81Y2384
Korea 12A/250 V C13/KSC 8305 (4.3 m)	81Y2385
India 10A/250 V C13/IS 6538 (4.3 m)	81Y2386
Brazil 10A/250 V C13/ NBR 14136 (4.3 m)	81Y2387
Taiwan 10A/125 V C13/CNS 10917 (4.3 m)	81Y2388
Taiwan 10A/250 V C13/CNS 10917 (4.3 m)	81Y2389
Switzerland 10A/250 V C13/SEV 1011 (4.3 m)	81Y2390

## Features

The IBM 1000VA and 1500VA LCD Tower UPS offerings include the following features and capabilities:

- Compact tower chassis.
- Energy efficient at over 95% at 100% load.
- Offers eight output power receptacles split across two load segments.
- Offers an LCD display that provides intuitive, at-the-rack management and monitoring capabilities that supports nine languages:
  - English
  - French
  - German
  - Spanish
  - Russian
  - Korean
  - Japanese
  - Simplified Chinese
  - Traditional Chinese
- Includes intelligent IBM UPS Manager software that enhances control and manageability.
- Compliant with IPv6 for future-proofing IP addressing and security.
- Intelligent load segments allow for independent control of two sets of output receptacles. You can reboot equipment, manage sequential shut downs and start ups, and reserve battery run time for the most essential equipment.
- Integrates with IBM Systems Director Active Energy Manager for power and thermal trending analysis and management.
- Supports an optional network management card (part number 46M4140) for enhanced UPS monitoring and control.
- Allows dual channel communication through the USB port and an optional Network Management Card at the same time, which is an effective redundancy feature that maximizes communications flexibility.
- Includes a Remote Emergency Power Off (REPO) port to remotely power off the UPS unit to prevent battery operation during a power failure.
- Requires a 20A single-phase circuit.
- Includes hot swap batteries for maximum uptime, availability, and ease of maintenance.
- Supports an optional Environmental Monitoring Probe (part number 46M4113) for thermal management requirements (temperature and humidity), which requires that the Network Management Card be installed.
- Uses Advanced Battery Management (ABM) three-stage charging technology, which significantly extends battery service life and optimizes recharge time. The three stages are:
  1. The battery is quickly charged to 90% to make sure the UPS is prepared for the next outage.
  2. ABM finishes charging the battery with a more moderate float charge.
  3. After the battery is charged, ABM turns the charger off, preventing the batteries from being overcharged.

## Specifications

Table 4 lists the specifications for the IBM 1000VA and 1500VA LCD Tower UPS models.

Table 4. Specifications

Specification	IBM 1000VA LCD Tower UPS (100 V)	IBM 1000VA LCD Tower UPS (120 V)	IBM 1000VA LCD Tower UPS (230 V)	IBM 1500VA LCD Tower UPS (100 V)	IBM 1500VA LCD Tower UPS (120 V)	IBM 1500VA LCD Tower UPS (230 V)
IBM part number	53961JX	53961AX	53961KX	53962JX	53962AX	53962KX
VA/Watts rating	1000 VA / 750 W			1500 VA / 1000 W		
Nominal output voltage (VAC)	100 VAC	120 VAC	230 VAC	100 VAC	120 VAC	230 VAC
Load groups	Two load groups (load segments): Two outlets in load group 1, six outlets in load group 2					
Output connections	Eight NEMA 5-15R	Eight NEMA 5-15R	Eight IEC 320 C13	Eight NEMA 5-20R	Eight NEMA 5-15R	Eight IEC 320 C13
<b>Input</b>						
Nominal input voltage	100 VAC	120 VAC	230 VAC	100 VAC	120 VAC	230 VAC
Input frequency (auto sensing)	50/60 Hz +/- 3 Hz					
Input connection type	IEC 320 C14	IEC 320 C14	IEC 320 C14	IEC 320 C20	IEC 320 C14	IEC 320 C14
Supplied Input cords	IEC 320 C13 to JIS C-8303 2.8 m	IEC 320 C13 to NEMA 5-15P 2.8 m	None (see Table 3.)	IEC 320 C19 to JIS C-8303 2.5 m	IEC 320 C13 to NEMA 5-15P 2.8 m	None (see Table 3.)
Input voltage range, mains operations	84 - 121 V	97 - 145 V	160 - 286 V	84 - 121 V	97 - 145 V	160 - 286 V
<b>Batteries</b>						
Typical backup times	See Table 5			See Table 6		
Battery type	Valve Regulated Lead Acid (VRLA) - maintenance-free, sealed, leak-proof					
Optional External Battery Pack	No	No	No	No	No	No
Typical recharge time	4 hours to 90% charge from a UPS/battery discharge of 50% rated load					

Table 4. Specifications (continued)

Specification	IBM 1000VA LCD Tower UPS (100 V)	IBM 1000VA LCD Tower UPS (120 V)	IBM 1000VA LCD Tower UPS (230 V)	IBM 1500VA LCD Tower UPS (100 V)	IBM 1500VA LCD Tower UPS (120 V)	IBM 1500VA LCD Tower UPS (230 V)
<b>Communications and management</b>						
USB HID port	Yes	Yes	Yes	Yes	Yes	Yes
RS-232 serial port	Yes	Yes	Yes	Yes	Yes	Yes
Ethernet port	Optional using Network Management Card, 46M4110					
Environmental Monitoring Probe	Optional Environmental Monitoring Probe, 46M4113					
Management software included	IBM UPS Manager					
Control panel	Intelligent three-button, dual color, and backlit graphical LCD displays vital UPS status in nine languages					
Audible alarm	Alarm when on battery: Distinctive low-battery alarm					
Remote Power Off	Remote Emergency Power Off (REPO) port					
<b>Surge Protection and Filtering</b>						
Surge energy rating	1200 Joules		2400 Joules	1200 Joules		2400 Joules
Filtering	ANSI/IEEE C62.41; 1991 CATEGORYB3 (SURGE)					

Table 5 lists the expected period that the IBM 1000VA LCD Tower UPS models will operate solely on batteries.

Table 5. IBM 1000VA LCD Tower UPS runtime chart

Load (%)	Load (VA)	Load (Watts)	Run time (minutes)
25	250 VA	188 W	25
50	500 VA	375 W	15
75%	750 VA	573 W	7
100%	1000 VA	750 W	6

Table 6 lists the expected period that the IBM 1500VA LCD Tower UPS models will operate solely on batteries.

Table 6. IBM 1500VA LCD Tower UPS runtime chart

Load (%)	Load (VA)	Load (Watts)	Run time (minutes)
25	375 VA	255 W	36
50	750 VA	510 W	15
75%	1125 VA	750 W	9
100%	1500 VA	970 W	6

Note: Battery backup times are approximate and may vary with equipment, configuration, battery age, and temperature. The IBM 1000VA and 1500VA LCD Tower UPS models do not support Extended Battery Modules (EBMs).

### Physical specifications

- Height: 246 mm (9.7 in.)
- Width: 160 mm (6.3 in.)
- Depth: 436 mm (17.2 in.)
- Weight: 1000VA models: 14 kg (32 lb); 1500VA models: 19 kg (42 lb)

### Operating environment

The IBM 1000VA and 1500VA LCD Tower UPS models are supported in the following environment:

- Temperature (operation): 0 to 40 °C (32 to 104 °F)
- Relative humidity: 5 to 95%
- Maximum altitude (operation): 3,000 m (10,000 ft)

### Warranty

The IBM 1000VA and 1500VA LCD Tower UPS models have a three-year limited warranty. Optional features have a one-year warranty

### Front panel controls

With a bright and easy-to-navigate panel that provides configurability and displays important status information, the IBM 1000VA and 1500VA LCD Tower UPS models are easy to manage and an ideal solution for standardization across the global enterprise. Runtime, load, and other vital information and troubleshooting are also displayed.

Figure 2 shows the front panel of the UPS.



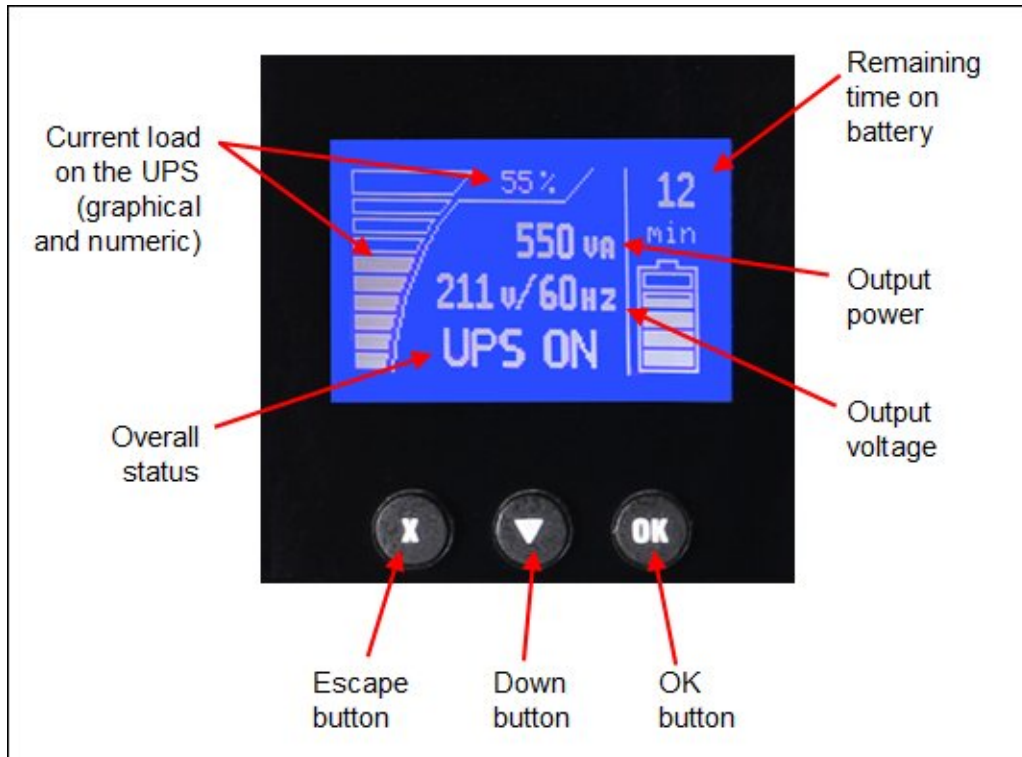


Figure 2. Front panel (showing System Status)

The following functions are available on the control panel:

- System status: Displays the battery status, load percentage, output power, output voltage and frequency, mode, and notice or alarm status.
- Alarm history: Displays the alarm history for the 50 most recent events.
- Meters: Displays the output watts VA, current, power factor, voltage, frequency, input voltage, input frequency, battery voltage, and percentage charged.
- Control screens: Displays the battery test, reset error state, configure load segments, and restore settings.
- Model information: Displays the machine type, model, and serial number of the unit, and the firmware level of the UPS, including the optional Network Management Card's firmware level and IP address, if installed.
- Configuration: Allows you to change up to 17 user settings with minimal navigation.

The buttons have the following functions:

- Escape (X): Press this button to return to the previous menu without running a command or saving any changes.
- Down (▼): Press this button to scroll down to the next menu option.
- OK: Press this button to select the current menu or option.
- On/off: Press this button to turn on the UPS. Press and hold this button for 3 seconds to turn off the UPS.

On some panels, the OK button has an additional function if you press and hold the button longer than 1 second:

- On the User Setting panels, this function saves the displayed setting.
- On the Meter and Notice/Alarm panels, this function locks the panel (that is, it prevents the panel from returning to its default after timeout). A locked panel displays a small key image near the status icon. To unlock the panel, press any button to perform its usual function.

## Rear panel

Figure 3 shows the rear panel of the 230 V models of the IBM 1000VA LCD Tower UPS (53961KX) and IBM 1500VA LCD Tower UPS (53962KX).

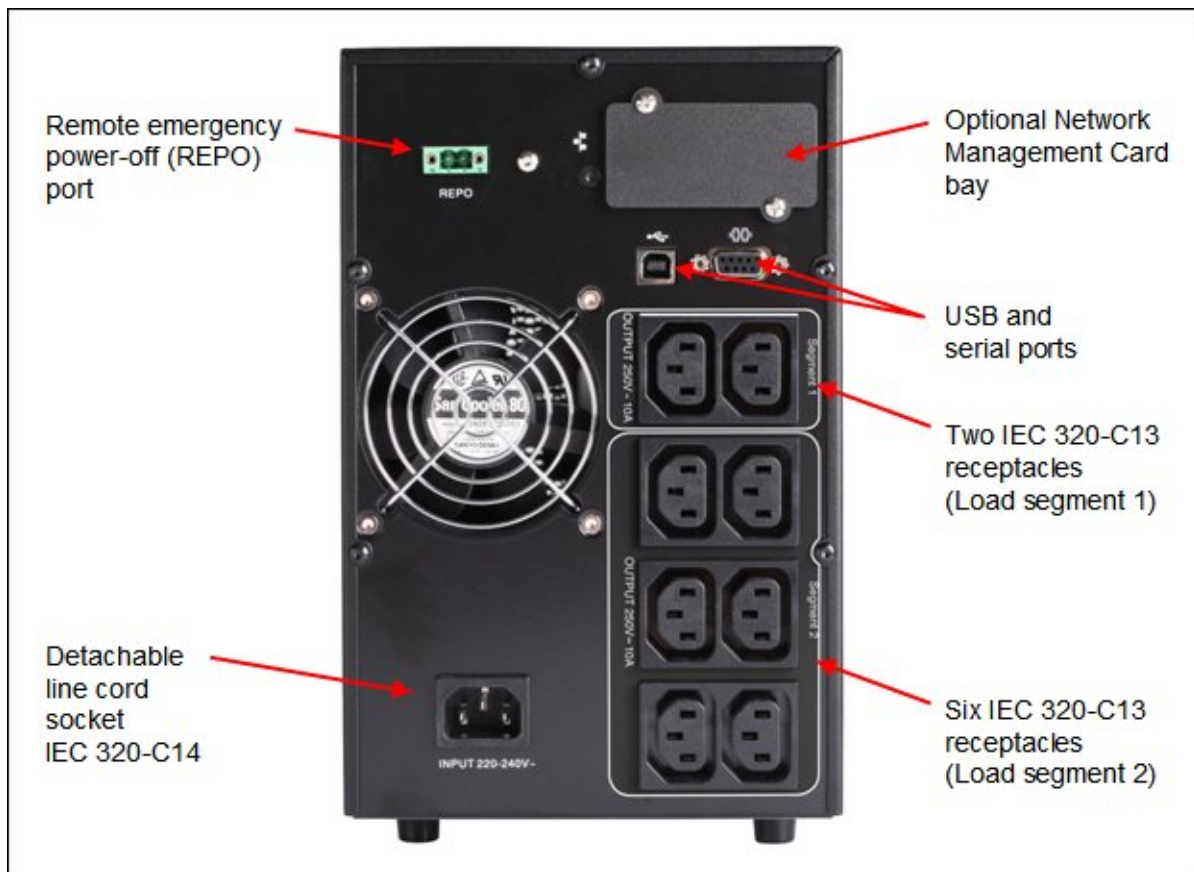


Figure 3. Rear panel of the 230 V models of the IBM 1000VA LCD Tower UPS (53961KX) and IBM 1500VA LCD Tower UPS (53962KX)

Figure 4 shows the rear panel of the 120 V models of the IBM 1000VA LCD Tower UPS (53961AX) and IBM 1500VA LCD Tower UPS (53962AX). The 100 V models (1JX and 2JX) look similar, although the IBM 1500VA LCD Tower UPS (100 V) 53962JX has an IEC 320 C20 input and eight NEMA 5-20R outputs.

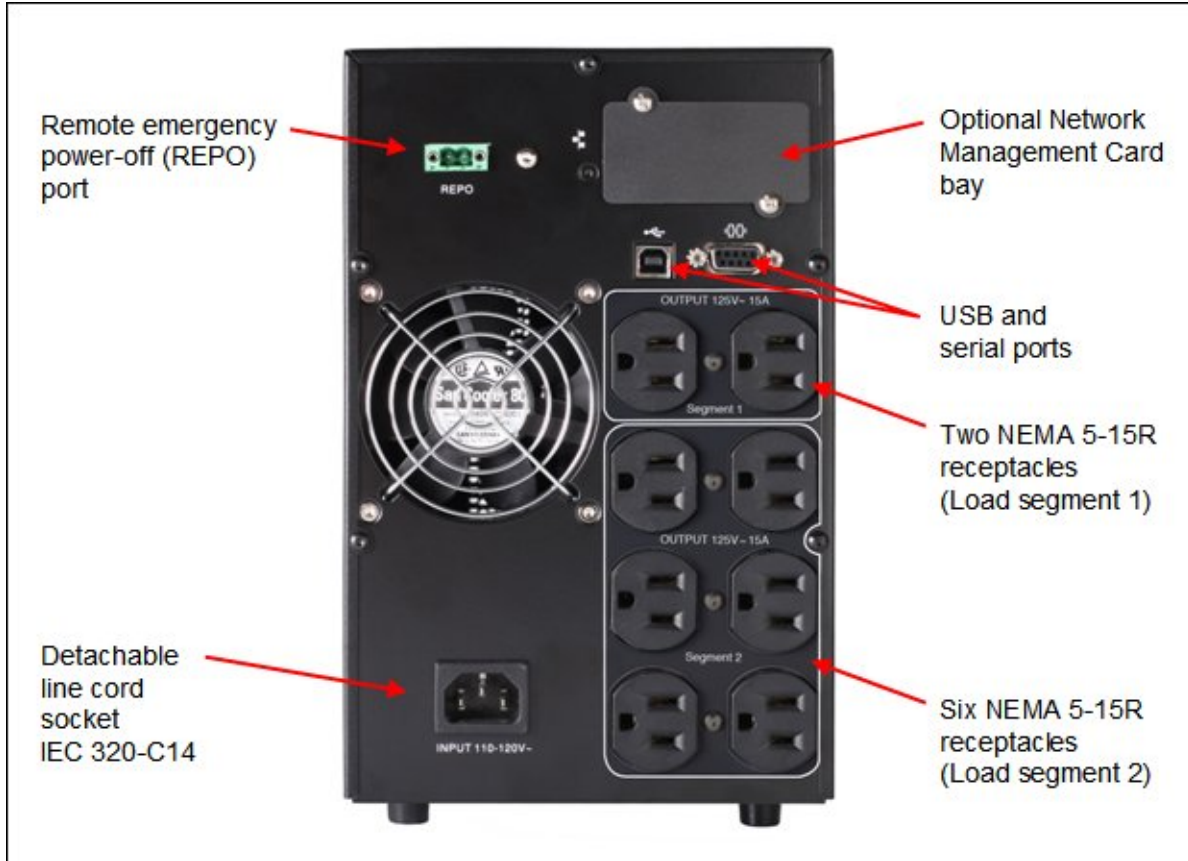


Figure 4. Rear panel of the 120 V models of the IBM 1000VA LCD Tower UPS (53961AX) and IBM 1500VA LCD Tower UPS (53962AX)

## Network Management Card

The IBM 1000VA and 1500VA LCD Tower UPS models also come equipped with a communication bay for the installation of an optional Network Management Card (46M4110). The Network Management Card provides convenient, over the network UPS remote monitoring and management through a standard web browser. Figure 5 shows the IBM LCD UPS Network Management Card (NMC).



Figure 5. IBM LCD UPS Network Management Card (NMC)

The IBM LCD UPS Network Management Card:

- Allows simultaneous shutdown of protected servers
- Allows configuration of automatic email messages in response to UPS alarms and to transmit periodic reports (see Figure 6)
- Allows control of UPS on/off switching with a web browser
- Allows adjustment and control of load segments through the HTML interface, including sequential starting of the installation and optimization of backup time by shutting down non-priority systems
- Allows protection by using an encrypted password
- Allows protection by using a secure SSL connection
- Allows log storage in the nonvolatile memory
- Allows card firmware updates through the network
- Allows fast Ethernet 10/100 Mbps compatibility with auto-negotiation on the RJ-45 connector
- Allows recording of events and measurements in the card log
- Has a humidity/temperature/dry contact sensor (optional EMP)
- Has support for IPv6
- Can be installed while the UPS is online maintaining the highest system availability

Figure 6 shows the Network Management Card UPS properties window.

The screenshot shows the 'UPS Properties' window for an IBM 1000VA/750W Tower UPS. The interface includes a navigation menu on the left with categories like UPS, Logs and Notification, Settings, and Environment. The main content area displays the UPS status, a diagram of the power flow, and detailed status information.

UPS Status	UPS Alarm	About your UPS
Power source :	AC Power	
Output load level :	0%	
Output :	Master : On Group1 : On Group2 : On	
<b>Battery</b>		
Battery load level :	97% Resting	
Remaining backup time :	6 h 14 mn 13 s	
Battery test status :	OK	
Last update : 2010/10/01 08:59:32		

Figure 6. IBM LCD UPS Network Management Card (NMC) UPS properties window

## IBM UPS Manager software

The UPS comes with the IBM UPS Manager software. The management software provides up-to-date graphics of UPS power and system data and power flow. It also gives you a complete record of critical power events, and notifies you about important UPS or power information. If there is a power outage and the UPS battery power becomes low, the software can automatically shut down the system to protect the data before the UPS shutdown occurs.

Figure 7 shows normal operating using the IBM UPS Manager. The input voltage is 122 V, which is within the acceptable range, and is shown in the left pane. The output voltage of the UPS is 121 V and is also within the acceptable range. The battery is in "floating" mode, which is the second stage of the Eaton Advanced Battery Management (ABM) three-stage charging technology.

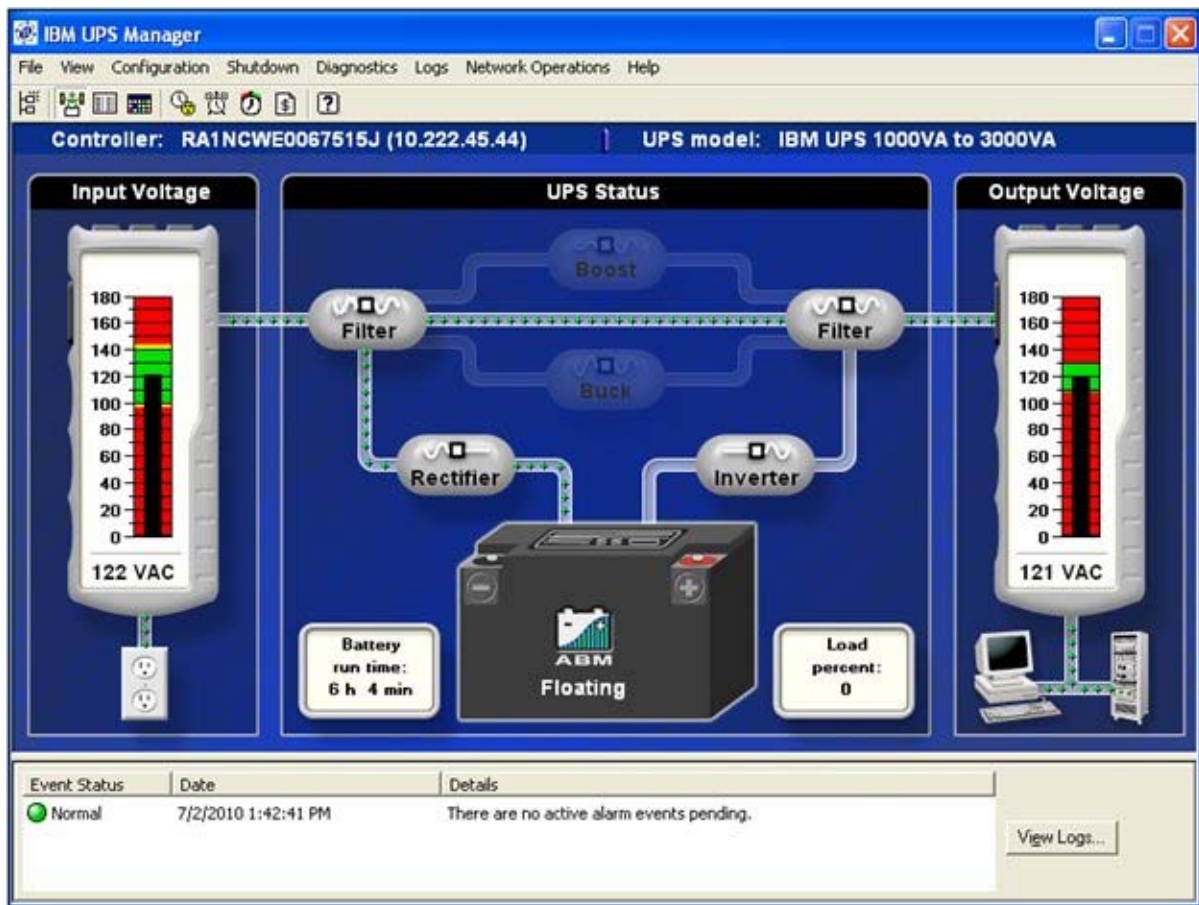


Figure 7. IBM UPS Manager normal status window

Figure 8 shows that the utility power supply has failed and that the UPS is now operating on battery. The UPS Manager software indicates that there is 10 minutes of battery time available based on the current load.

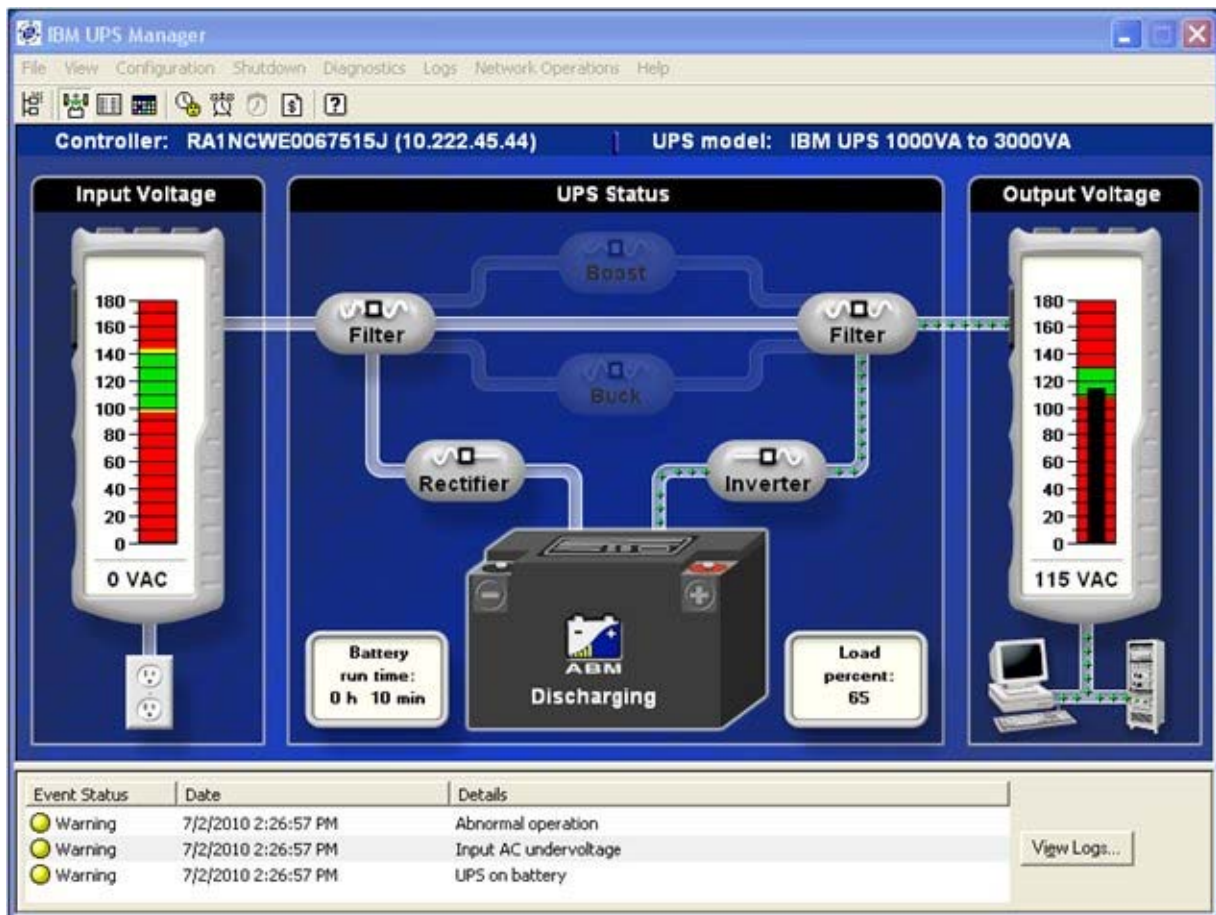


Figure 8. IBM UPS Manager warning status window

Figure 9 shows the event notification window where you can configure how you (and other users) want to be notified when certain events occur.

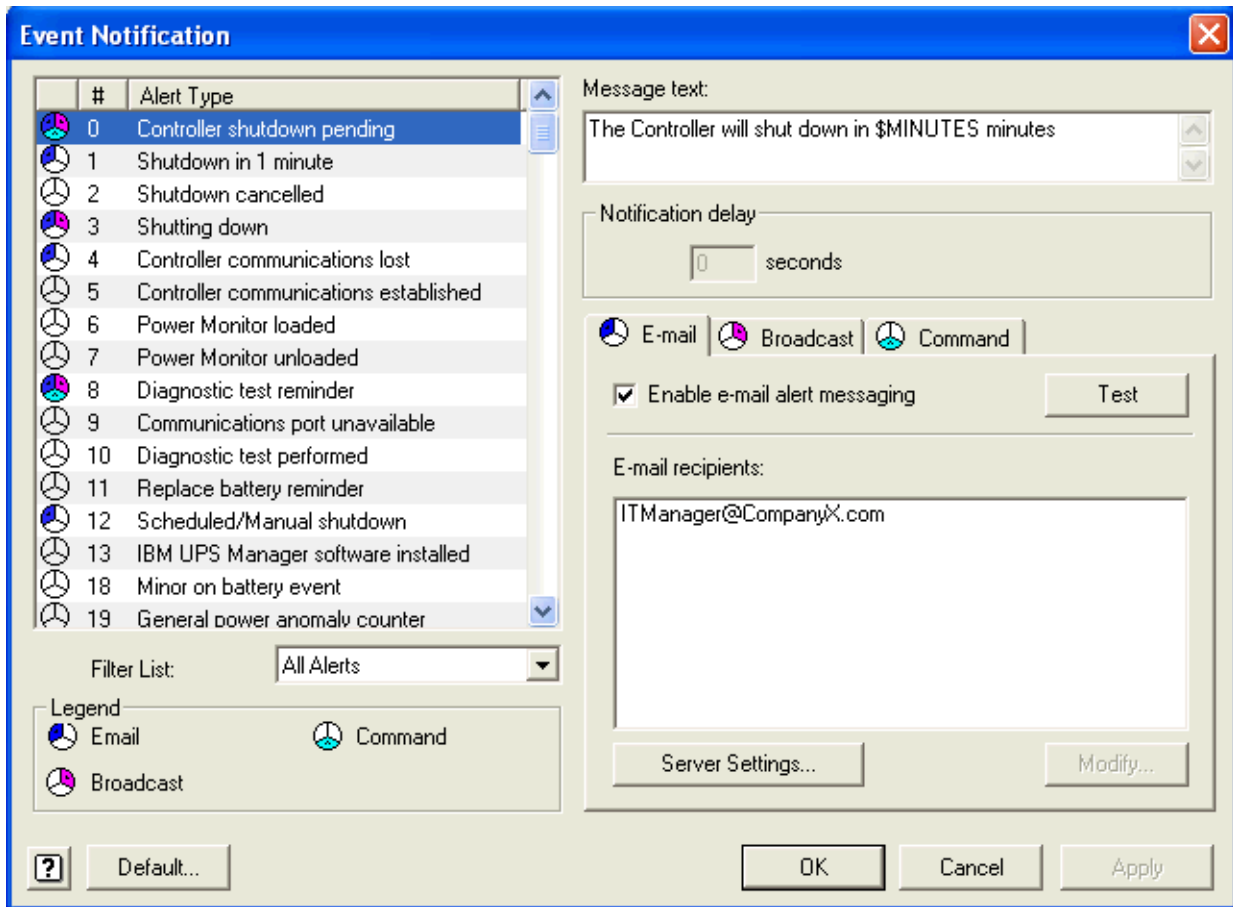


Figure 9. Event Notification window



## IBM Environmental Monitoring Probe

The Environmental Monitoring Probe (EMP) (part number 46M4113) is used to report local temperature and humidity values and make that information available to management tools, such as IBM Systems Director Active Energy Manager (AEM). The EMP connects to the UPS via the Network Management Card. The EMP is shown in Figure 10.



Figure 10. IBM Environmental Monitoring Probe (EMP)

The Environmental Monitoring Probe has the following characteristics:

- It connects to the Network Management Card (NMC) settings/sensor connection.
- Its temperature and humidity thresholds are easily set to trigger alarm notifications or shut down the protected system.
- Its status can be monitored from the IBM Systems Director AEM or from the Network Management Card web interface.
- It measures temperatures between 0 and 80°C (32 and 176°F) with an accuracy of  $\pm 1^{\circ}\text{C}$ .
- It measures relative humidity between 10 and 90% with an accuracy of  $\pm 5\%$ .
- It can be located away from the UPS by using a CAT5 network cable (up to 20 m (65.6 ft)).
- Its user-selectable alarm thresholds enable you to define acceptable temperature or humidity limits.
- It allows email notification through SMTP.

Figure 11 shows information retrieved from an EMP using the NMC web interface.



Figure 11. Environmental Monitoring Probe data as viewed from the Network Management Card web interface

## IBM Systems Director Active Energy Manager

IBM Systems Director Active Energy Manager (AEM) provides an array of new features that allow power and thermal trending analysis for improved power management. AEM collects power information for each device attached to an IBM UPS, presenting a more complete view of energy usage within the data center.

The IBM Systems Director Active Energy Manager (AEM) helps:

- Collect power information from each device attached to an IBM UPS, thus presenting a more complete view of energy usage.
- With server consolidation plans, because of the increased server and rack power densities that have driven the requirement for advanced power management solutions.
- In combination with the optional Environmental Monitoring Probe, AEM enables cross-platform power and thermal trending analysis for improved power management. This configuration allows IT and facility managers to manage data centers for optimal energy efficiency, migrate workloads to eliminate hot spots, and transfer work from underutilized systems to conserve energy.

## Related publications

For more information about this topic, refer to these documents:

- IBM US Product Announcement  
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS110-210>
- IBM System x tower UPS product page  
<http://www-03.ibm.com/systems/x/options/rackandpower/ups.html>
- *IBM 1000VA and 1500VA LCD Tower UPS Installation and Maintenance Guide*  
<http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5085920>
- *Network Management Card User Guide*  
<http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5085199>
- *IBM System x Configuration and Options Guide*  
<http://ibm.com/support/entry/portal/docdisplay?Indocid=SCOD-3ZVQ5W>

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