UPS Power Protector

User's Guide

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Note: Before using this information and the product it supports, read the general information in Appendix B, “Notices,” on page 69.

First Edition (June 2013)

Contents

Chapter 1. Introduction

The IBM UPS Power Protector software is a graceful shutdown application.

You can shut down a local computer through the uninterruptible power supply (UPS) USB or RS-232 communication ports or IBM Network Management Card (NMC).

You can also configure or monitor the shutdown by using the IBM UPS Power Manager software.

Notices and statements in this document

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage might occur.

Chapter 2. Installing the UPS Power Protector software

This chapter provides instructions for installing the UPS Power Protector software.

Before installing the UPS Power Protector software, see “Installation prerequisites.”

Installation prerequisites

The installation prerequisites are described in the following sections.

On the system hosting UPS Power Protector

Supported operating systems

Microsoft Windows:

- Microsoft Windows Server 2012
- Microsoft Windows Server 2011
- Microsoft Windows Server 2008
- Microsoft Windows Server 2003
- Microsoft Windows 8
- Microsoft Windows 7
- Microsoft Windows Vista
- Microsoft Windows XP

Red Hat Enterprise Linux:

- Red Hat Enterprise Linux 6.3
- Red Hat Enterprise Linux 6.2
- Red Hat Enterprise Linux 5.9
- Red Hat Enterprise Linux 5.8
- Red Hat Enterprise Linux 5.7
- Fedora core 18

SUSE Linux Enterprise Server:

- SuSE Linux Enterprise Server 11
- SuSE Linux Enterprise Server 11
- SuSE Linux Enterprise Server 10
- OpenSuse 12.2
- OpenSuse 11.4

Debian GNU Linux:

- Debian 6 (Squeeze)
- Debian 5 (Lenny)

Ubuntu:

- Ubuntu 12.10
- Ubuntu 12.04 LTS
- Ubuntu 11.04 LTS
- Ubuntu 10.04 LTS

VMware:

- vSphere Hypervisor (ESXi) 5.1
- vSphere Hypervisor (ESXi) 5.0
- vSphere Hypervisor (ESXi) 4.1
- vSphere Hypervisor (ESX) 4.0

Microsoft Hyper V:

- Windows Hyper-V Server 2012
- Windows Hyper-V Server 2008 R2
- Windows Hyper-V Server 2008

Xen:

- Citrix XenServer 6.0
- Citrix XenServer 5.6
- OpenSource Xen 2.6 on Red Hat Enterprise Linux 5
- OpenSource Xen 3.2 on Debian 5

KVM:

- KVM 0.12.1.2 on Red Hat Enterprise Linux 6 and Debian 5

Note: The Linux package is based on standard Linux mechanisms and therefore can be installed and used with other Linux distributions. To send feedback, test or bug reports to IBM, see Appendix A, “Getting help and technical assistance,” on page 65.

Software compatibility limitations

To avoid network or serial port access conflicts, *do not* install the UPS Power Protector on a system that also hosts the following programs:

- Network Management Proxy
- Personal Solution Pac
- LanSafe and LanSafe Web View
- Netwatch

Standby configuration (Windows)

When you click **Configuration Panel→Power Options** note the following information:

- You must clear the Standby configuration check box of your operating system to be compliant with UPS Power Protector. If the standby configuration is selected, your system is not protected.
- If you want to save energy, choose the hibernate feature.

Device driver installation

UPS Power Protector installs all the necessary device drivers (for USB communication). If the Windows operating system wants to install a device driver during a Windows update, you can cancel this process.

On the web-based graphical user interface

The UPS Power Protector graphical interface can be accessed remotely using a web browser. Access to this interface can be secured through an SSL connection and through a login and password.

The UPS Power Protector graphical interface is supported on the following web browsers:

- Google Chrome (tested with version 25 and later)
- Mozilla Firefox (tested with version 19 and later)
- Windowst Internet Explorer 7, 8, 9, 10
- Opera 12

Note: For optimal performance, use Google Chrome or Mozilla Firefox.

Downloading the UPS Power Protector software

You can install the UPS Power Protector software on any storage media such as a hard disk connected to a laptop, workstation, or any other device that is running one of the supported operating systems. For the supported operating systems, see “Installation prerequisites” on page 3.

To download the UPS Power Manager software, go to one of the following websites:

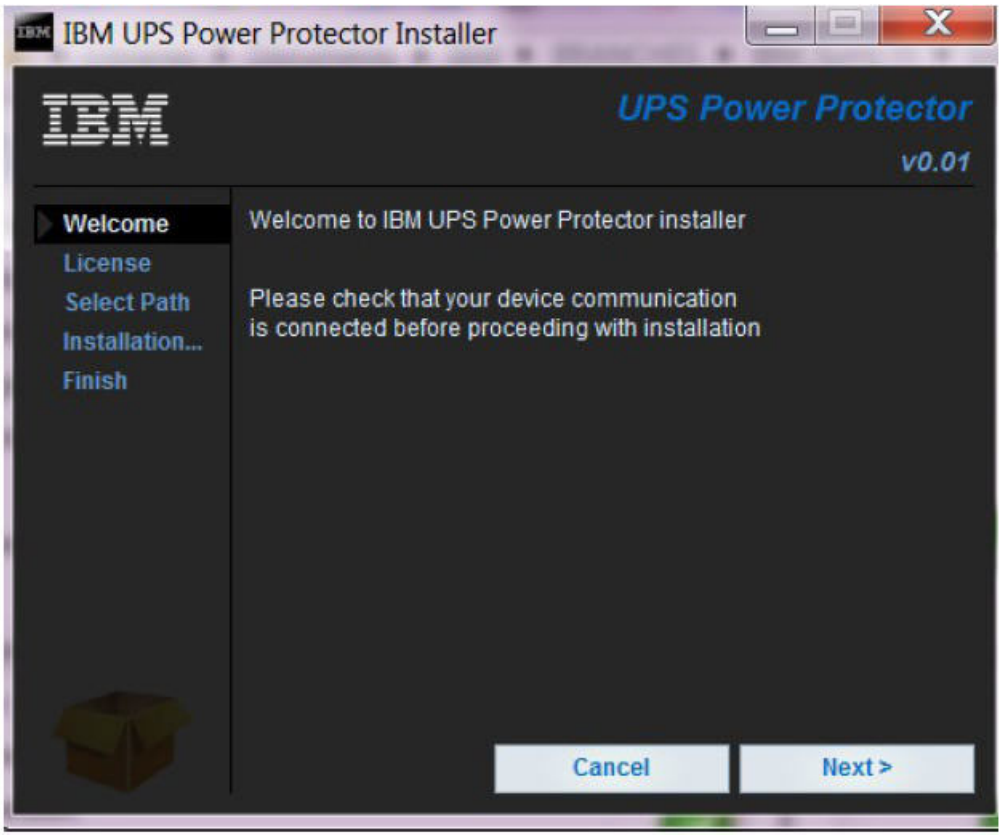
- For Windows: http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPWIN
- For Linux: http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPLNX

Quick start and installation

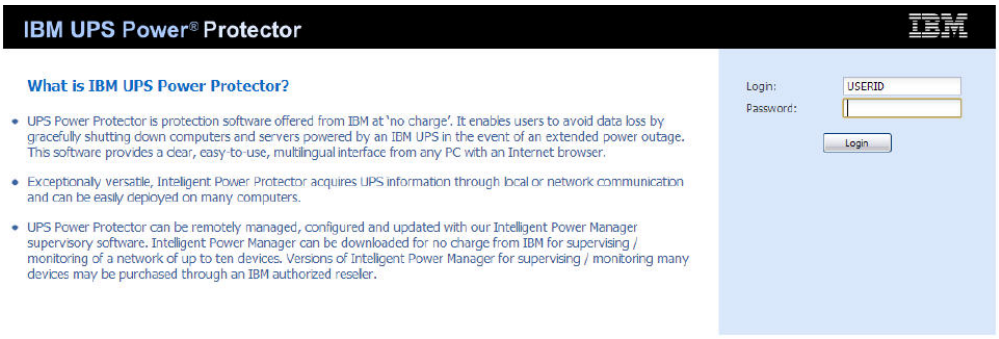
To install the UPS Power Protector software, complete the steps in this section. For more detailed information, see “Windows installation” on page 8 or “Linux installation” on page 9.

Step 1 (installation)

On a computer that is running a supported Windows or Linux operating system, run the IBM UPS Power Protector package under an administrator account.



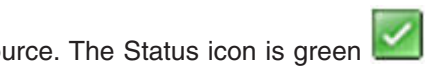
A web browser is automatically displayed. Enter `USERID` as the Login and `passw0rd` as the Password and click **Login**. A pop-up message advises you to change your default login and password.



Step 2 (configuration)

The application automatically performs a quick scan after it starts. The quick scan operation shows the following information:

Serial line-connected UPSs (RS-232 or USB)

The discovered UPS connected through RS-232 or USB is automatically assigned as the power source. The Status icon is green  .

Networked UPSs (through broadcast within a few seconds)

Quick Scan is compatible with the IBM Network Management Card.

The UPS discovered on the network is not automatically assigned as the power source. (You have to select the node and click the **Set as Power Source** button.

The icon changes to green  .)

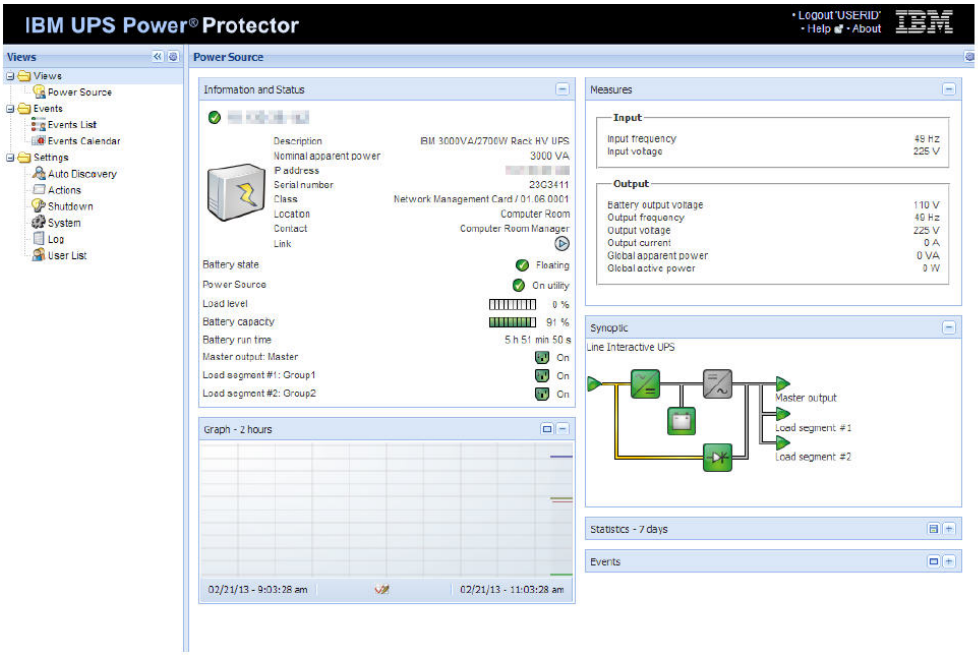
Click **Settings → Auto Discovery** to display the discovered nodes.

For the other nodes, perform the discovery based on IP address ranges (Range scan). Using the Range Scan operation you will discover the nodes that are outside of the network segment.

Click **Settings→Shutdown** to assign the IP address of the UPS that powers the local computer. Click **Settings→User List** to assign the access rights through the login and password.

Step 3 (operation)

The **Views→Power Source** menu item (optional) allows you to supervise the current state of the UPS that powers the server that is running UPS Power Protector.



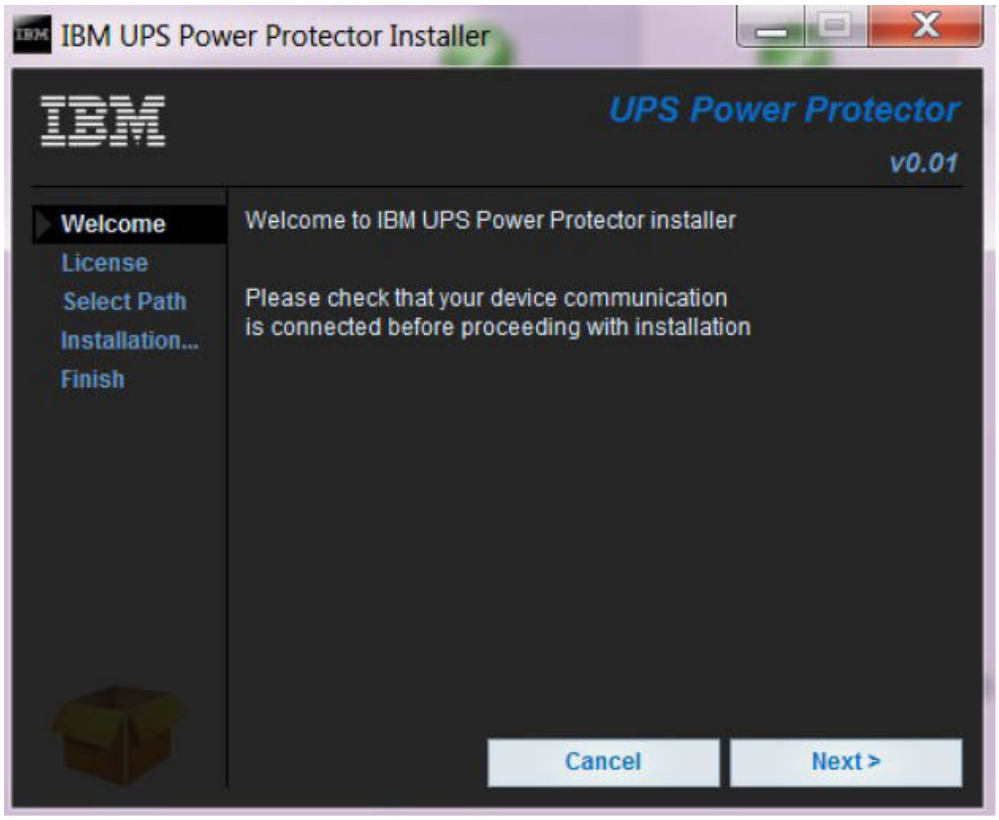
Click **Events → Event List** to view the device events.

Windows installation

You can install the UPS Power Protector application by using a web browser or a command line.

Graphical installation

Download the UPS Power Protector application from the IBM website. For more information, see “Downloading the UPS Power Protector software” on page 5. Run the IBM UPS Power Protector package under an administrator account.



A web browser is automatically displayed. Enter `USERID` as Login and `passw0rd` as Password and click **Login**.

Note: If the browser does not open, type `http://127.0.0.1:4679` in the browser address field.

Installing or uninstalling UPS Power Protector from a command line

You can install or uninstall UPS Power Protector from a command line to deploy the software to multiple computers with or without the graphical interface. This method also provides the ability to configure protection settings from the command line.

You can obtain details about available command options by using the following command:

```
<packageName> -help
<packageName> [COMMAND] [OPTION]...
```

The following are available commands:

- `-install` - Launches the installation or upgrade process (default).

- `-uninstall` - Launches the uninstallation process.

The following are the available options:

- `-debug` - Displays debugging information on the console.
- `-silent` - Installs the application silently.

An installation folder can be created using the following command:

```
-dir <installPath>
```

The following example will install UPS Power Protector silently in `C:\Program Files\MyFolder`:

```
<packageName> -install -silent -dir "C:\Program Files\MyFolder"
```

After the installation is complete, go to http://*host*:4679/, where *host* is the host name or IP address of the computer hosting UPS Power Protector.

Notes:

1. If you install a new IBM UPS Power Protector release without uninstalling the old one you will keep your product settings.
2. At the end of the installation, the following options are available when you click **Start → Programs → IBM → UPS Power Protector**.

Name	Description
Open IBM UPS Power Protector	Opens the IBM UPS Power Protector web page from the default browser.
Start IBM UPS Power Protector	Starts the service.
Stop IBM UPS Power Protector	Stops the service.
Uninstall IBM UPS Power Protector	Uninstalls the program.

3. A service called IBM UPS Power Protector is also created for the Database Acquisition Engine. This service provides the web interface and automatically starts when the computer starts up.
4. An alarm notification box, accessible from the System Tray icon, displays the alarms on the local computer.

Uninstalling UPS Power Protector

You can uninstall UPS Power Protector in the following ways:

- Click **Start → Control Panel → Add/Remove** programs and select the **IBM UPS Power Protector Vx.xx** package.
- You can also uninstall UPS Power Protector from the shortcut by clicking **Start → Programs → IBM → UPS Power Protector → Uninstall IBM UPS Power Protector**. This removes the software and the custom file,s if you confirm it.

Linux installation

UPS Power Protector for Linux is available both in native package form (.deb or .rpm) and as a generic installer for the command line interface (CLI).

Native installation on a Red Hat, SUSE, Mandriva, or derivative system

Graphical installation

To install graphically, double-click on the IBM UPS Power Protector .rpm package. The system prompts for the root password, and then launches a graphical front-end, such as Red Hat's Package Installer as shown in the following illustration.

Command line installation

To install from a command line, type the following command (as root user):

```
$ rpm -i UPP-linux_X.Y.Z.rpm
```

For example:

```
$ rpm -ivh UPP-linux-1.10.032-1.i386.rpm
Preparing... ########################################### [100%]
1:UPP-linux ########################################### [100%]
```

After the installation is complete, open a web browser and enter `http://<@IP>:4679/`, where `<@IP>` is the IP address of the computer hosting UPS Power Protector.

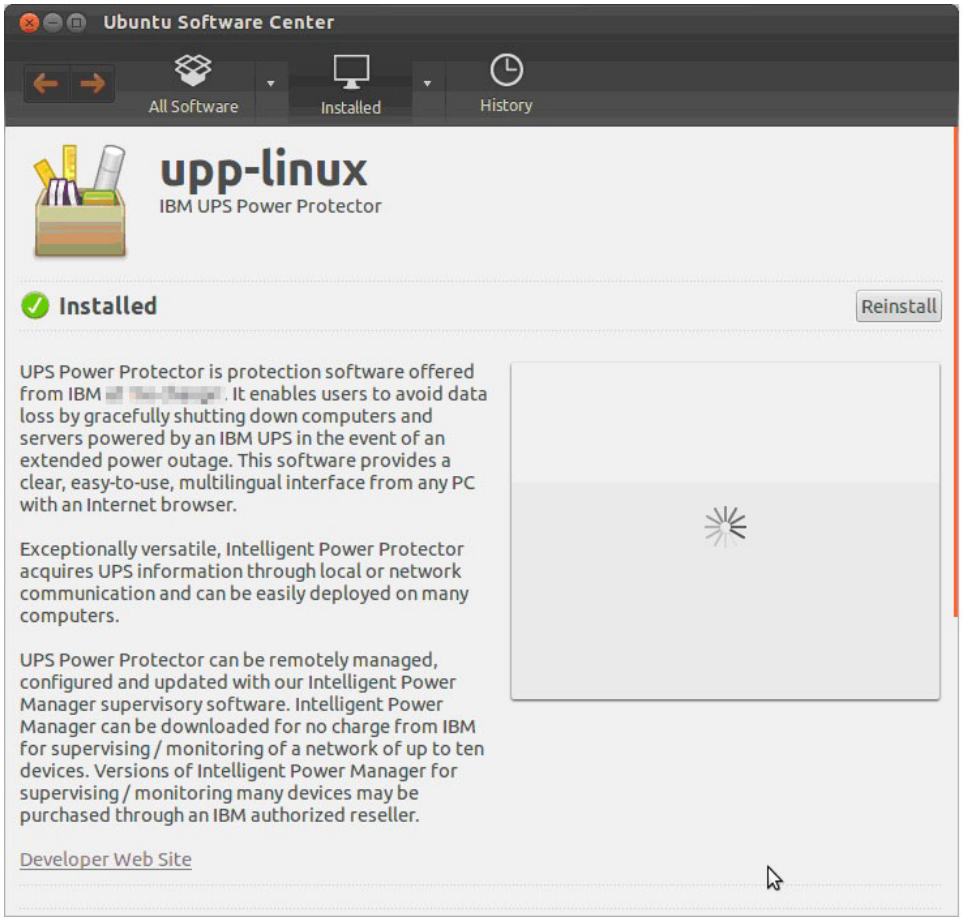
Native installation on a Debian or derivative system

Graphical installation

Prerequisite: On Debian 5 (Lenny), there is no default graphical installer present. You can either use the command line installation, or install the packages gdeb and gdebi and restart your graphical session to be able to complete the installation.

Note: This is a known Debian bug, which is registered in the Debian Bug Tracking System: http://bugs.debian.org/585183.

To install graphically, double-click on the**IBM UPS Power Protector.deb** package. The system will prompt for the root password, and then launch a graphical front-end, such as Gdebi, as shown in the following illustration.



Click **Install Package**. After the installation is completed, select **Application → IBM → UPS Power Protector Open** (in Gnome) and see Chapter 3, “Configuring UPS Power Protector,” on page 15.

Command line installation

To install from a command line, use the following command (as a root user):

```
$ dpkg -i UPP-linux_X.Y.Z.deb
```

For example:

```
$ dpkg -i UPP-linux_1.10.032-1_i386.deb
(Reading database ... 352242 files and directories currently installed.)
Preparing to replace UPP-linux 1.10.032 (using .../UPP-linux_1.10.032-1_i386.deb
)...
Unpacking replacement UPP-linux ...
Setting up UPP-linux (1.10.032)...
```

After the installation is completed, go to http://*@IP*:4679/, where *@IP* is the IP address of the computer that is hosting UPS Power Protector.

Generic installation on Linux

If your system does not derive from Red Hat (using .rpm) or Debian (using .deb); you can install UPS Power Protector using the generic package.

Note: This method is supported only from the command line.

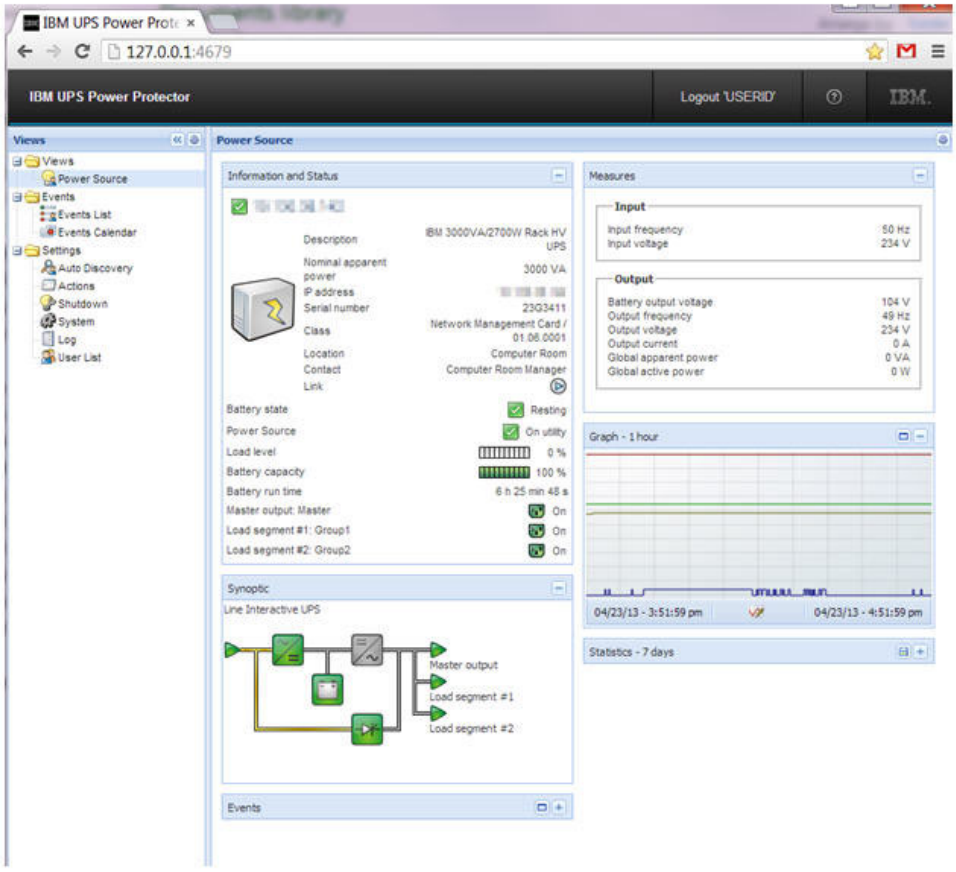
To install from a command line in interactive mode, use the following command from where the generic installer is located (as root):

```
$ UPP-linux-1_10_035-i386.run -install
```

For silent installation, add the `-silent` parameter as shown below (as root):

```
$ UPP-linux-1_10_035-i386.run -install -silent
```

After the installation is completed, go to http://*@IP*:4679/ , where *@IP* is the IP address of the machine hosting UPS Power Protector.



Uninstalling UPS Power Protector

If you chose the native packages for installing UPS Power Protector, you can use your preferred package-management application to remove the UPP-linux package. You can also do the same from the command line. For example, on Red Hat and derivatives, enter the following command:

```
$ rpm -e UPP-linux
```

On Debian and derivatives, enter the following command:

```
$ dpkg -r UPP-linux
```

Note: After uninstalling the native .deb or .rpm packages, some user configuration and data are not removed, due to technical constraints. If you want to fully remove these, enter the following command (as root):

```
$ rm -rf /usr/local/IBM/UPSPowerProtector
```

If you have chosen the generic installer, use the following command for interactive uninstall (as root):

```
$ /installation/path/mc2 -uninstall
```

For a silent uninstallation, add the `-silent` parameter (as root) as shown in the following command:

```
$ /installation/path/mc2 -uninstall –silent
```

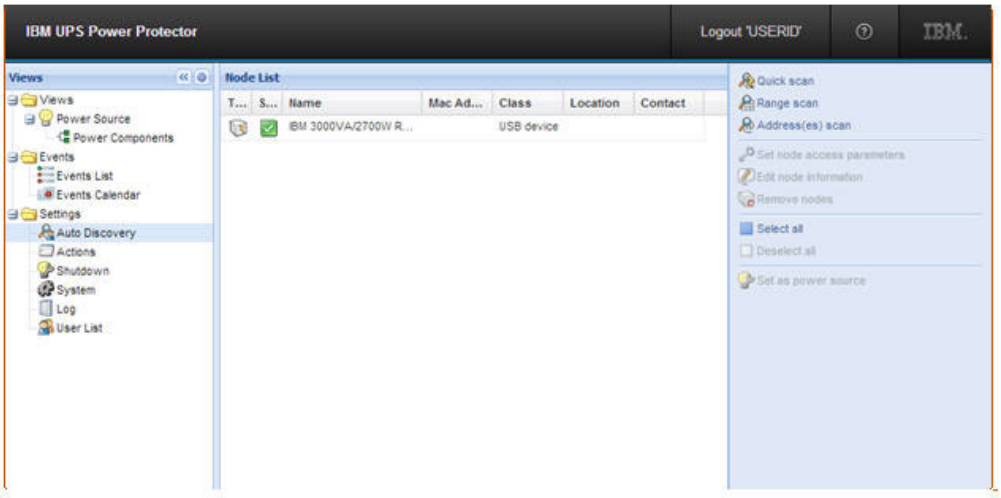
Chapter 3. Configuring UPS Power Protector

This chapter contains information about configuring the UPS Power Protector application by using the Settings menu.

Discovering the UPSs connected through a USB or serial port

Start the **UPS Power Protector** main graphical interface from the previously created shortcut. Click **Settings →Auto Discovery**.

The first discovered UPS that is connected through a USB or RS232 port is automatically assigned as the power source. The Status icon is green .



Discovering the nodes that are connected on the network

The following discovery methods are available from the Auto Discovery menu:

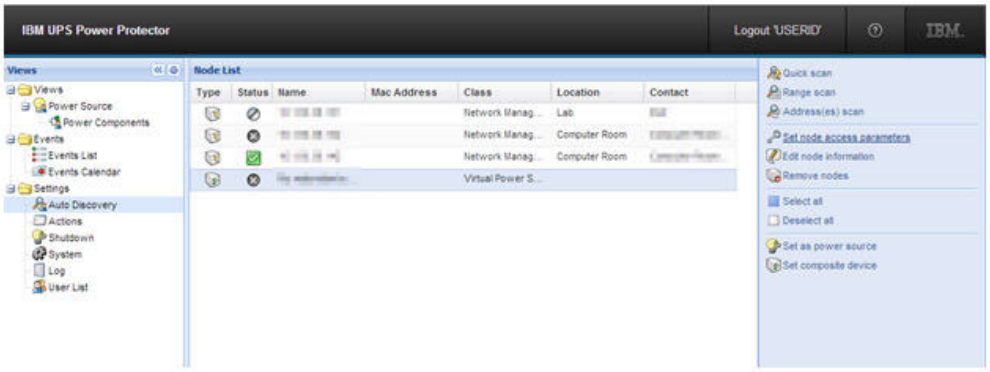
- Quick scan (automatically performed when the application starts)
- Range scan
- Address scan

Notes:

1. Each network node must have a valid IP address (or a DNS name) in the range that you have entered for auto-discovery. UPS Power Protector automatically receives the alarms through notification or polling.
2. The Quick Scan request is a broadcast frame on 4679 Internet Assigned Numbers Authority (IANA) reserved port and 69 standard TFTP port. Using the Quick Scan operation, you can discover the IBM Network Management Card through broadcast within a few seconds.
3. For the nodes outside of the network segment, perform the discovery based on IP address ranges (Range scan).
4. Address scan performs a single address scan. The discovered UPS that is connected through a network is not automatically assigned as the power source. To assign it as the power source, select the node and click **Set as Power Source**.

5. The Edit shutdown configuration window opens automatically when the power source is set. To configure the shutdown parameters, see “Shutting down UPS Power Protector.”

6. After the power source is configured, the icon is green  , or it is gray  if the communication fails.



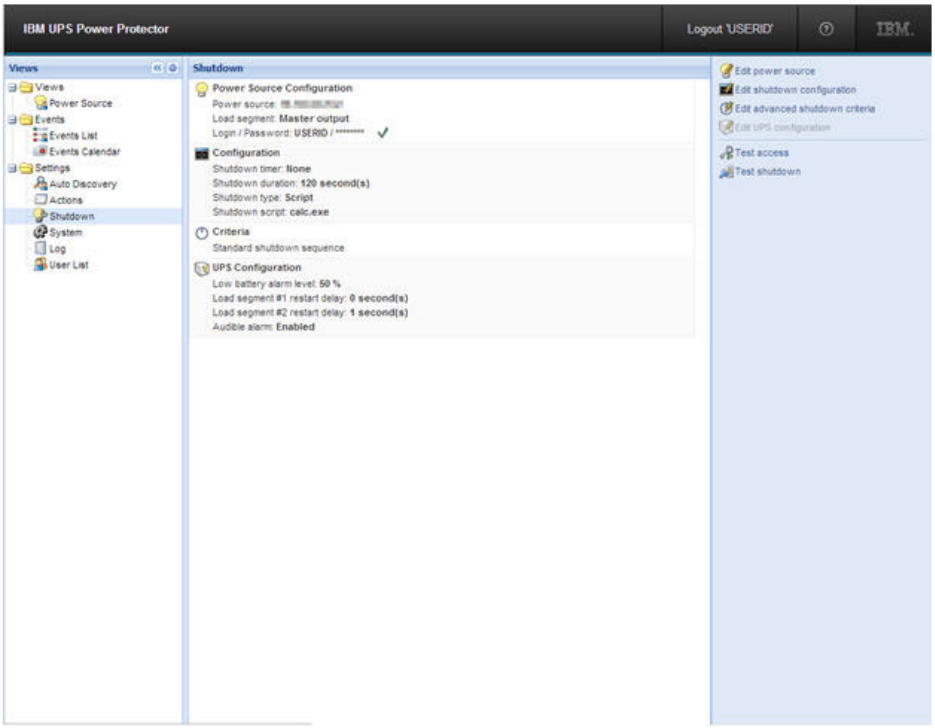
Shutting down UPS Power Protector

You can use UPS Power Protector to shut down a UPS, server, or computer from your local computer through the following devices:

- USB or serial communication port
- Network

To configure the server shutdown, complete the following steps:

1. Log in with an administrator user profile.
2. Click **Settings→Shutdown** and the following page is displayed.



From this page the following configuration options are provided:

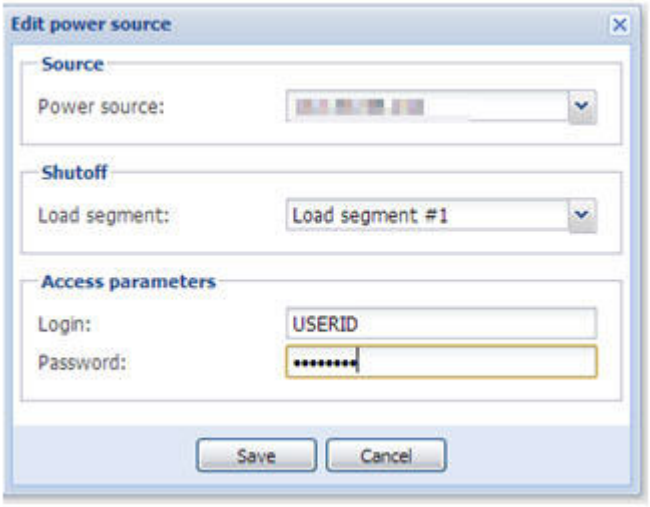
- Edit power source
- Edit shutdown configuration
- Edit advanced shutdown criteria
- Edit UPS configuration
- Test acess
- Test shutdown

These configuration options are described in the sections below.

Power source

To configure the power source, complete the following steps:

1. Click **Edit Power Source**.



2. In the **Power source** field select the UPS that powers the computer that is hosting UPS Power Protector. (This setting is also accessible by selecting **Settings → Auto-Discovery → Set as PowerSource**.)
3. Check the other parameters and click **Save**.

Other parameters: The following are the other parameters you can configure for the power source:

Load Segment

(Optional) the load segment that powers the server hosting UPS Power Protector.

Note: When Master is selected, the entire UPS will switch off.

Access parameters

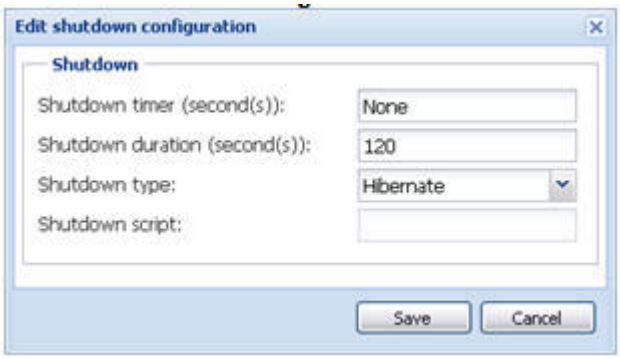
When the power source is managed through the network:

- If the power source is the IBM Network Management Card, the login name and password are needed only if IBM UPS Power Protector has to set values in the card. (For example, when you change the shutdown duration value.)
- If the power source is another UPS Power Protector with the Shutdown controller feature activated, the login and password are mandatory. The login must be an account with an administrator profile.

In case of a misconfigured Shutdown feature, the software signals a communication error. Check that the power source and access parameters (if needed) are correctly set.

Editing shutdown configuration

To configure Shutdown parameters, click **Edit shutdown configuration**.



The following parameters can be configured:

Shutdown timer

(Optional) The time period from the time of the power failure until the launch of the UPS shutdown sequence.

Shutdown duration

The shutdown delay needed to correctly shut down the computer.

Shutdown type

The following shutdown types are available:

- Hibernate (default option)

  If this option is available with your operating system, it is better to use it (first available with Windows 2000) because there are a number of advantages. If the system is shut down, all work in progress and system information are automatically saved to the disk. The computer itself is also de-energized. When mains power returns, all the applications reopen exactly as they were and you are returned to the work environment. The Hibernate function must first have been activated in the operating system. In the Power options on the Windows control panel, check that the Hibernate option is activated on the Hibernate tab sheet.

  Notes:

  1. If you select hibernate, but your computer does not have this function, UPS Power Protector will still protect the installation by carrying out the normal (default) shutdown.
  2. For Windows Vista, refer to the FAQ section of this manual.

- Shutdown

  This option shuts down your applications and the system, but does not de-energize the computer. The system offers you the choice to de-energize the computer, in which case it is the UPS that cuts power. On most computers, this configuration is necessary if you want the server to restart as soon as mains power returns.

- Power-off

  This option shuts down your applications and the system, and de-energizes the computer. This configuration is advised if you want to be there when the system restarts (or for load shedding).

- Script

  This option manages the shutdown in a custom script that you can create to fit with your own shutdown sequence. You can integrate the standard Windows shutdown command. (More information can be found by entering the `shutdown /?` command in a Windows Command Line interpreter.) The shutdown script is the absolute path of the script.

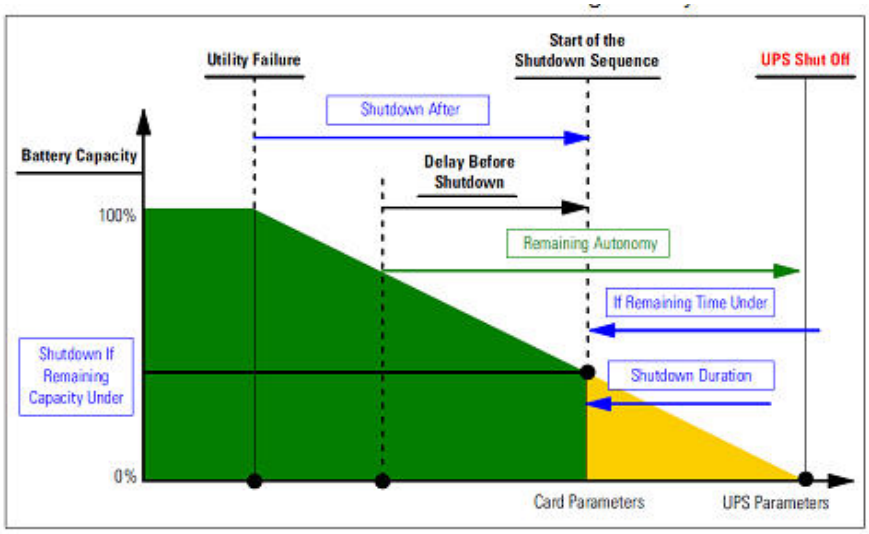
Outlet shutoff active

Using this option, UPS Power Protector sends a delayed shutoff command to the outlet. This delayed command is sent to the UPS at the beginning of the shutdown sequence, and this is the point of no return for this sequence. The outlet is turned off at the end of the shutdown sequence.

Shutdown sequence trigger

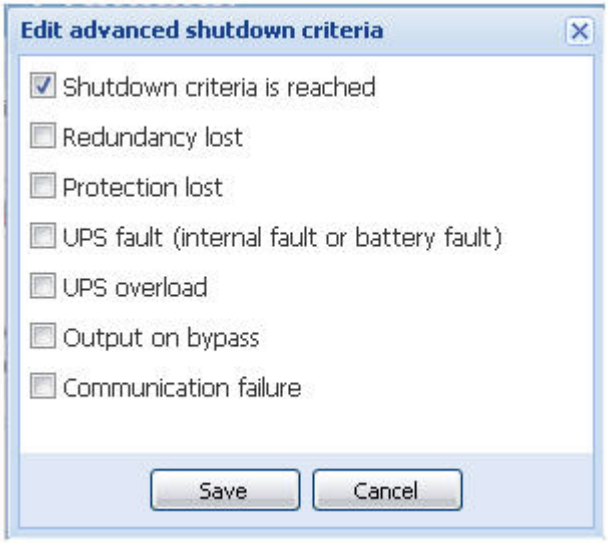
When a power utility failure occurs, the shutdown sequence is started as soon as the first of the two following conditions is reached:

- After the Shutdown timer (if configured).
- When the network management card or UPS shutdown criteria is reached. See the following illustration.



Editing advanced shutdown criteria

Select **Edit advanced Shutdown Criteria** to open the Edit advanced shutdown criteria window.



Shutdown criteria is reached is the option enabled by default. This is the standard shutdown sequence taking into account time based criteria and UPS low battery level criteria.

In addition, you can also select one or several events in the following events list. If these events are selected, they will trigger an immediate shutdown sequence when they occur.

- Redundancy lost
- Protection lost
- UPS fault (internal fault or battery fault)
- UPS overload
- Output on bypass
- Communication failure

Note: When using a Virtual Power Source (in redundant configuration), only the following criteria can be used:

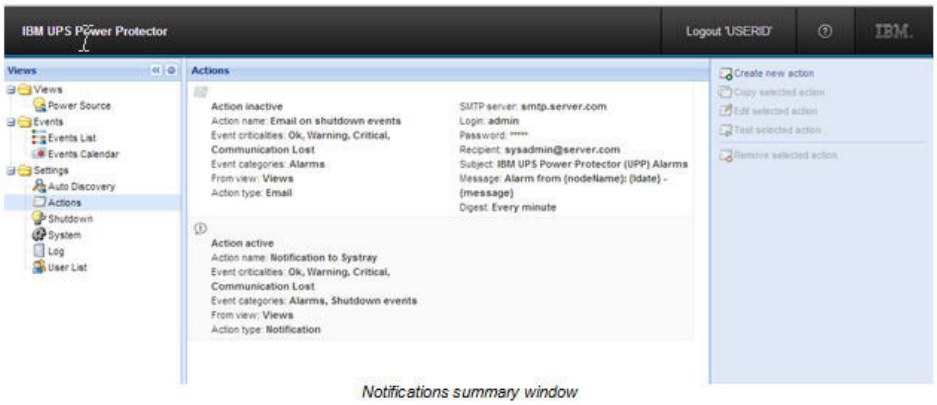
- Shutdown criteria is reached.
- Redundancy lost.
- Protection lost.

Editing UPS configuration

Select **Edit UPS Configuration** to open the UPS Configuration page. It is available for some UPSs connected through a USB or serial port. Otherwise, the parameters are displayed as read only through the network or if the UPS does not support this feature.

You can configure the following UPS parameters:

- Low Battery alarm level
- Load Segment restart delays
- Audible alarm



Notifications summary window

Testing access

Test access checks whether the login and password are correctly configured so that UPS Power Protector can do the following:

- Update the shutdown configuration on the card
- Remotely access to the UPS Power Protector shutdown controller

Testing shutdown

Test shutdown starts a shutdown procedure (according to the UPS Power Protector parameters).

Shutdown use cases

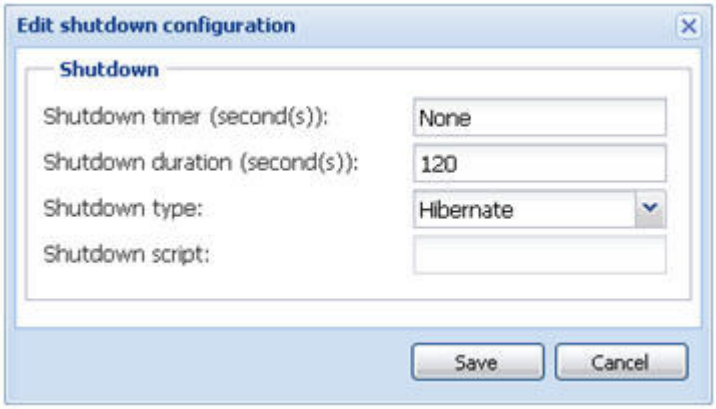
In the following sections, several typical use cases are described to help you configure the shutdown sequence according to your needs.

Architecture 1 (locally attached UPS through a serial or USB port)

Use case 1

You want to keep your computer actively hosting UPP1 for as long as possible.

This is the default UPP1 configuration. The following illustration shows this UPS Power Protector default configuration that is available by selecting **Settings → Shutdown → Edit Shutdown Configuration**.

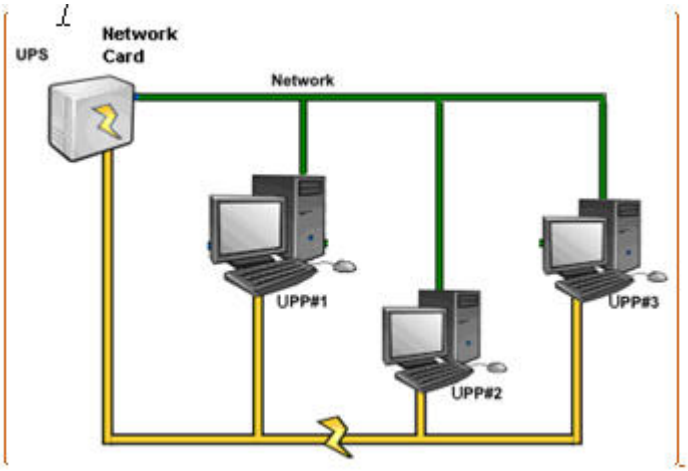


Use case 2

To save battery backup time, you want to perform load shedding (stop your computer after a predefined time).

Configure a Shutdown timer value on UPP1. (This configuration parameter is available by selecting **Settings→Shutdown→Edit Shutdown Configuration.**)

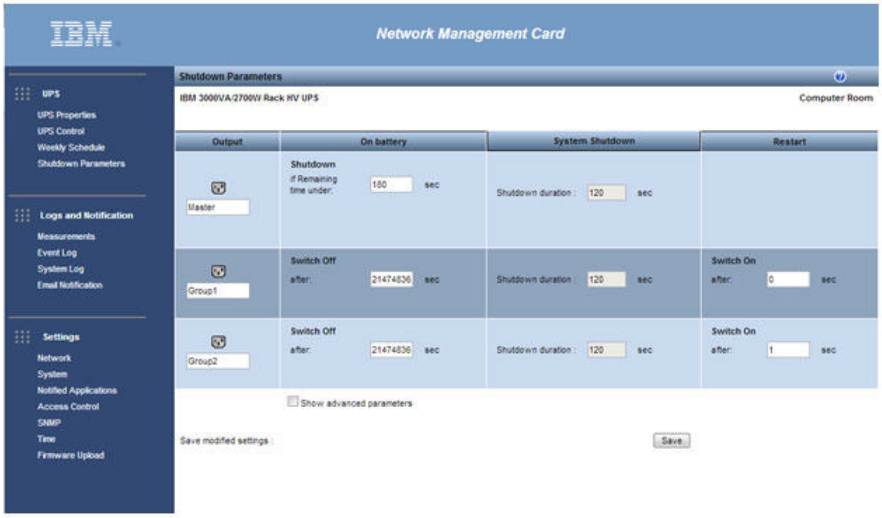
Architecture 2 (network-attached UPS network management card)



Use case 1

You want to keep all the computers active for as long as possible. This is the default configuration for the UPS Power Protectors and the Network-MS.

The UPS Power Protector default configuration is available by selecting **Settings → Shutdown → Edit Shutdown Configuration**. For example, for the IBM Network Management Card, the default shutdown configuration is available by selecting **UPS→Shutdown Parameters** as shown in the following illustration.



Use case 2

To save battery backup time, you want to stop all your computers after a predefined time.

On the web/SNMP UPS card, configure a Shutdown Criteria. For example, Network-MS (for example, 66102 / 103006826) and Modbus-MS (for example, 66103) web/SNMP UPS card shutdown configurations are available by selecting **UPS→Shutdown Configuration**.

Note: In this case the computer automatic restart is guaranteed.

Use case 3

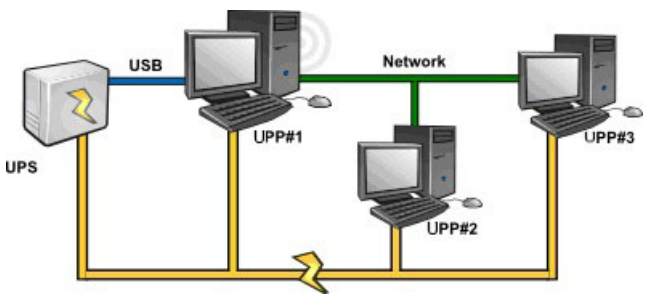
You want to perform load shedding on the specific computer that is hosting UPP2 (that is, stop the computer hosting UPP2 after a predefined time).

On UPP2, configure a Shutdown timer value. (This configuration parameter is available by selecting **Settings→Shutdown→Edit Shutdown Configuration**.)

Notes:

1. In this case the automatic restart for the computer hosting UPP2 is not guaranteed.
2. Use case 3 can be combined with Use case 1 or Use case 2.

Architecture 3 (network-attached UPS through shutdown controller)



Use case 1

You want to keep your computers active for as long as possible.

This is the default shutdown configuration for the Shutdown Controller UPP#1 and other UPS Power Protector installations. The UPS Power Protector default configuration is available by selecting **Settings→Shutdown → Edit Shutdown Configuration.**

Use case 2

To save battery backup time, you want to stop all your computers after a predefined time.

On UPP#1 (the shutdown controller) configure a Shutdown timer value. (This configuration parameter is available by selecting **Settings→Shutdown→Edit Shutdown Configuration**.)

Note: In this case the automatic restart for all the computers is guaranteed.

Use case 3

You want to perform load shedding on the computer hosting UPP #2. (Stop the computer hosting UPP#2 after a predefined time.)

On UPP#2, configure a Shutdown timer value. (This configuration parameter is available by selecting **Settings→Shutdown→Edit Shutdown Configuration**.)

Notes:

1. In this case the automatic restart for the computer hosting UPP#2 is not guaranteed.
2. Use case 3 can be combined with Use case 1 or Use case 2.

Use case 4

Typical example with four computers. According to the server configuration, you might want to shut down the servers at different times:

Computer hosting UPP1

The computer hosting UPP1 is directly attached to the UPS (USB or serial port) The shutdown controller has to be installed on the server that will be the last one to shut down.

Computer hosting UPP2

The computer hosting UPP2 is a computer that requires a long delay to shut down (for example, hosting database or VMware).

Computer hosting UPP3

The computer hosting UPP3 is a computer that requires being the last one to be shut down because other servers depend on it (for example, it is the file server).

Computer hosting UPP4

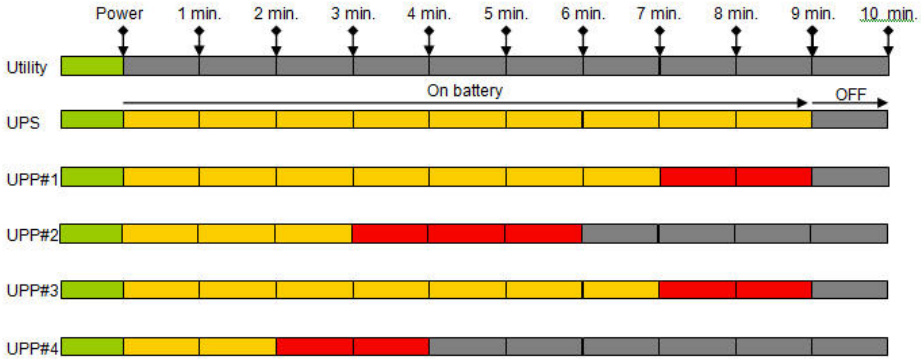
The computer hosting UPP4 is another server that has to be stopped before computer B or C (web server) or this computer can also be stopped for load shedding purpose (workstation).

Use the following configuration settings:

- On UPP#1: Configure **Shutdown Timer** to None and **Shutdown Duration** to 120 s.
- On UPP#2: Configure **Shutdown Timer** to 180 s and **Shutdown Duration** to 180 s.
- On UPP#3: Configure **Shutdown Timer** to None and **Shutdown Duration** to 120 s.

- On UPP#4: Configure **Shutdown Timer** to 120 s and **Shutdown Duration** to 120 s.

The following time diagram summarizes this configuration.

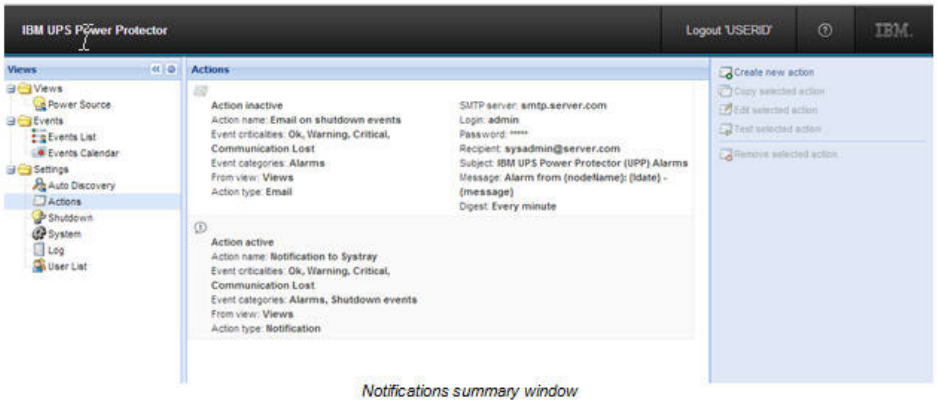


Configuring actions

You can define the way users are notified when node events happen.

Click **Settings→Actions**. The following notifications methods are available:

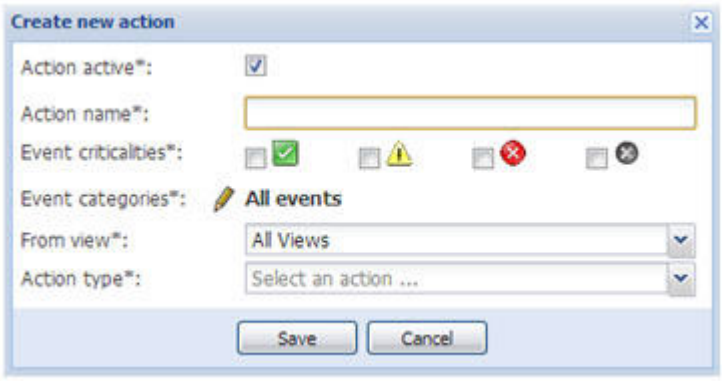
- Email
- Execute script/program
- Notification to the local alarm notification box, available from the System Tray icon.



Notifications summary window

Creating a new action

Click **Create new action** in the upper right of the window to create a new action.



Notes:

1. The fields marked with an asterisk (*) are required.
2. Clicking on the pen icon starts an assistant to fill the field.

Action active
Enables/disables the action.

Action name
Name for the action.

Events filter
You can filter the action according to the following criteria:

- The **Event criticality** (Critical, Warning, Normal, Communication Lost).

  Note: With this parameter, you can filter the notification according to the event level. (See the following events list.) If you select Critical as the filter, you will not receive the associated Normal event informing you that the device status changed from Critical to Normal.
- The **Event category** (All Events, Alarms, Shutdown events, Power events, Measures). (See the following events list.)
- The view that triggers the event (**From view**).

Action type
You can select the following actions:

- Email
- Command
- Notification

According to your choice, specific settings are available for each action. The configuration of these three actions are described in the following sections.

Detailed alarms and events list in the **Event category**:

Alarms:

- Utility failure
- Communication lost
- Shutdown Imminent
- Battery Low

- Internal Failure
- Overload
- Output On/Off
- Outlets On/Off
- Battery Fault
- On Automatic Bypass
- On Manual Bypass
- Redundancy Lost
- Protection Lost

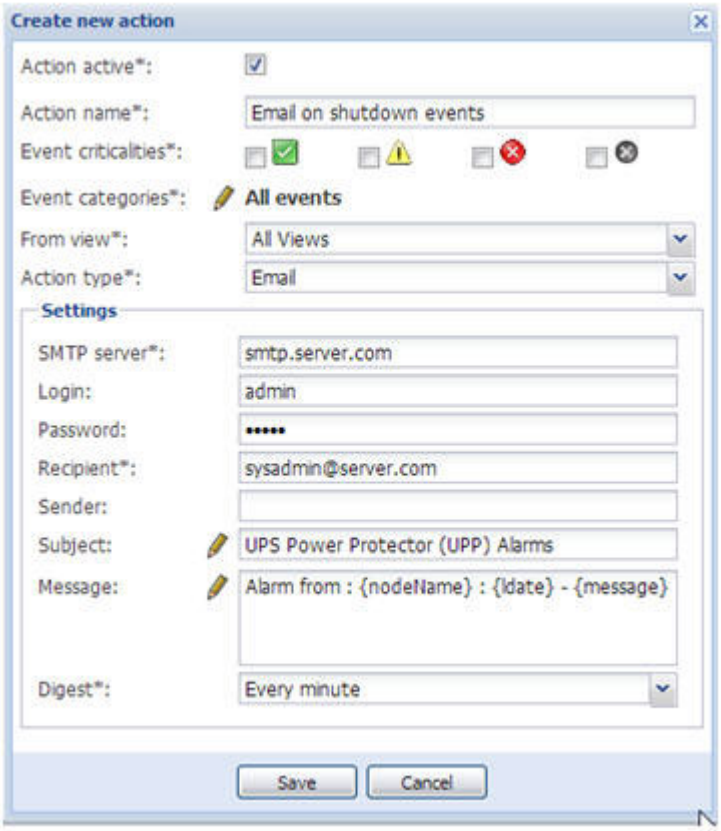
Shutdown events:
- Utility failure
- Battery Low
- Shutdown Imminent
- Local Run Time to Shutdown

Power events:
- Output Percent Load
- Output Apparent Power
- Output Active Power
- Output Power Factor
- System Defined Output Overload Alarm

Measures:
- Output Percent Load
- Battery Remaining Capacity
- Battery Run Time to Empty
- Main 1: Voltage, Current and Frequency
- Main 2: Voltage, Current and Frequency
- Output: Voltage, Current and Frequency
- Output Apparent Power
- Output Active Power
- Output Power Factor

Email

The email action is not active by default. Some of the fields are preconfigured by default.



For the fields at the top of the Edit action window, see “Creating a new action” on page 26.

The following are the specific email settings:

- SMTP Server: To receive emails on UPS events, you have to indicate the SMTP server IP address.
- Login and Password: Authentication information of the SMTP server.
- Recipient: Receiver email address.

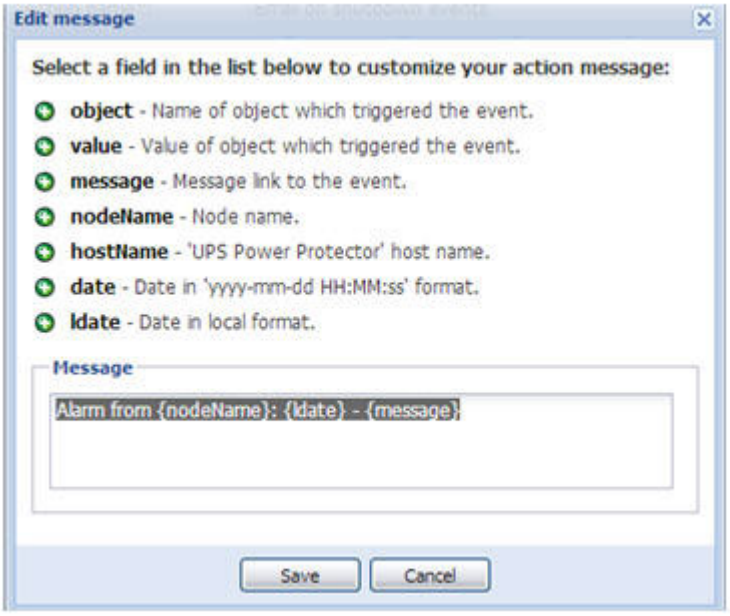
  Note: You can specify multiple receivers by separating them with a comma.
- Sender: (Optional field) The email sender.

  Note: The SMTP server might require a valid email address.
- Subject: The email subject. This field can be customized with predefined variables.
- Message: The email message body. This field can be customized with pre-defined variables.
- Digest: You can specify that you want to receive a consolidation of the alarms that occurred during a delay that you can choose. If you specify none, each alarm will generate an email. With this setting you will receive more emails for the same number of events. The possible values are:
  - None
  - Every 10 seconds
  - Every minutes
  - Every hour

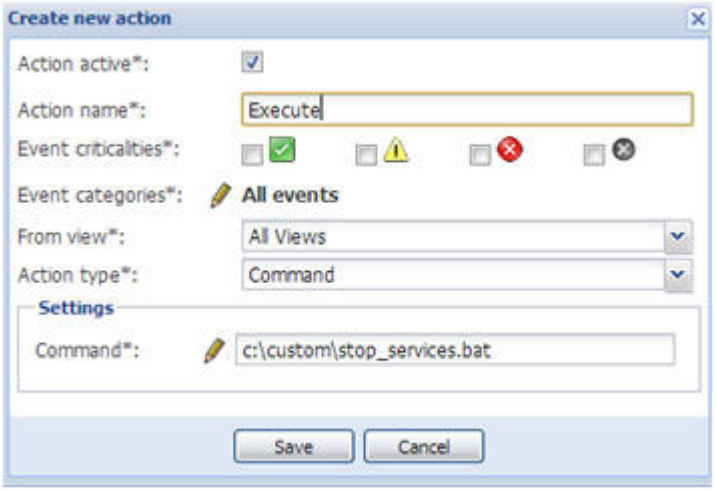
– Every day

Notes:

1. It is possible to duplicate an existing action that is already configured and only change the parameters.
2. For advanced use, you can customize the subject and message, for example, if you have to translate an email into an SMS (using an email to SMS external provider). Click the pen icon to start the **Edit message** assistant to fill the field with variables. Click  to add a variable.



Command (running a script or program)



To run a program on UPS events, the program path is required.

For example, to play sound alarms on events, create a batch command file containing the command:

```
mplay32.exe /play /close
C:/WINDOWS/Media/<sound>.wav
```

Create an Action type of Command that calls this batch file.

Notes:

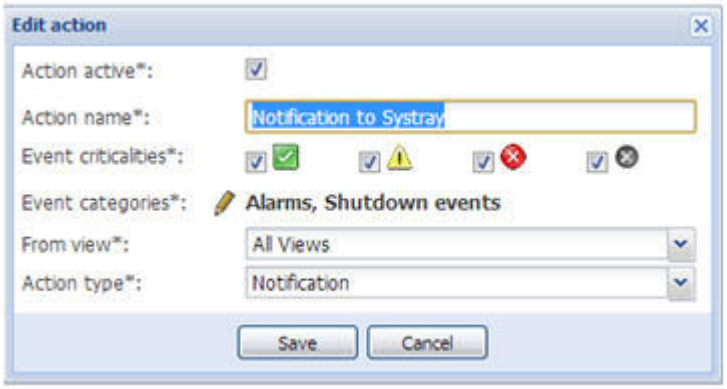
1. For Windows, the program is run under the System account. To run some privilege commands, you might have to apply the following procedure: It might be necessary to modify the context before certain actions can be run. To allow a user to run specific tools and programs with permissions that are different from those assigned to the user account, use the Windows **RunAs** command which allows you to save the password (Windows XP Service Pac 2 or later). Use the following Windows command:

   ```
   runas /profile /user:<my login> /savecred <my_program.exe>
   ```

   The first time you run the command, a password is required; it is saved for subsequent commands.
2. For Linux, the UPS Power Protector process runs under the root privilege. (The **sudo** command is not needed to run a program or shell script.)

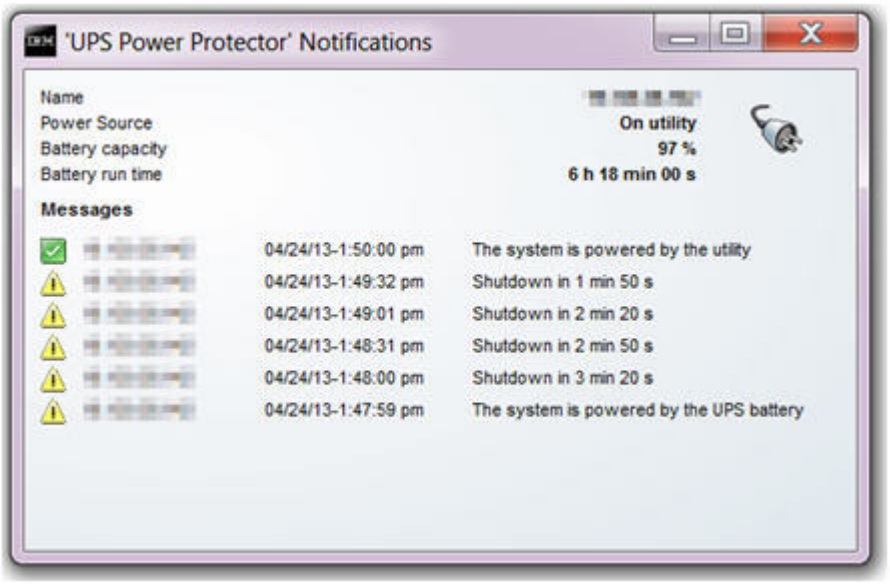
Notification (alarm box)

The Notification action is active by default.



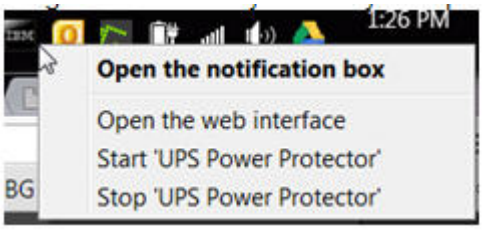
The alarms are displayed on the local computer in an alarm box.

This Notifications window (alarm box) displays the last ten alarms. The Notification window is displayed in the foreground every time there is an alarm. From the event section you can view more than ten alarms.



The window appears on foreground every time there is an alarm. The alarm notification box is accessible from the System Tray icon. Click the icon to open the window that displays the alarms on the local computer.

Right clicking the System Tray icon provides faster access to the following functions:



If a power source has been declared, the System Tray icon can have the following states:

	The System Tray icon correctly receives alarms from UPS Power Manager: AC is present on the power source.
	The System Tray icon correctly receives alarms from UPS Power Manager: The power source runs in battery mode.
	The System Tray icon correctly receives alarms from UPS Power Manager: A warning event occurred on the power source.
	The System Tray icon correctly receives alarms from UPS Power Manager: A critical event occurred on the power source.
	Communication with the power source has failed.

Advanced events and actions customization

In the UPS Power Protector installation folder, you can see a configs/scripts folder containing a sample user-defined action script (sample_user_script.js). You can

modify this script or create new scripts that define very specific events and actions. The sample script provides details about the expected structure and syntax for defining new actions and triggers. To activate the execution of a script you have to set the enabled property to true as shown in the following example:

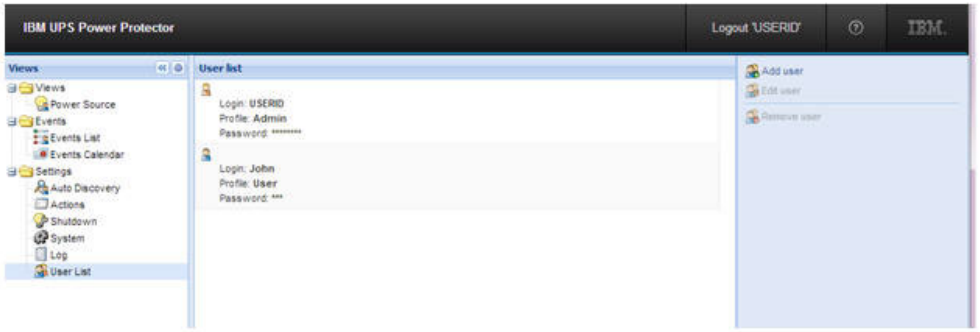
```
UserScript =
{
  name: "MyScript",
  enabled: true, // Set this property to true to enable the script
```

Configuring user accounts

Multiple user accounts can be configured.

From the **Settings** menu, click **User List**, then complete the following steps:

1. Click **Add user**.
2. Set the **User Login** and the **User password**.
3. Select the user **Profile** level. The following levels are available:
   - admin (The user can access all the features.)
   - user (The user can access only the supervision feature and cannot set parameters for the system or nodes.)
4. Click **Create new user**.



User Accounts window

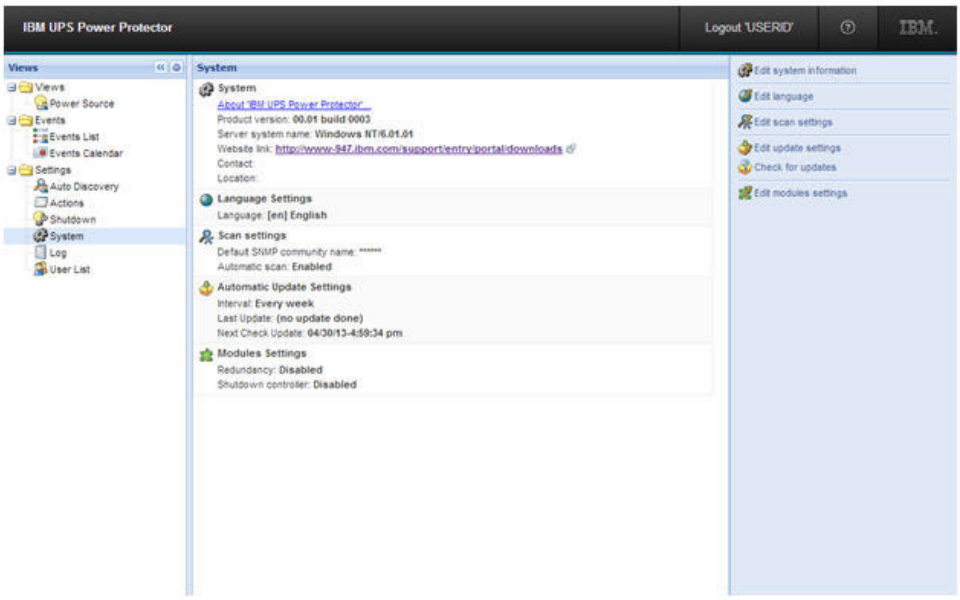
UPS Power Protector contains a default Administrator profile with:

- USERID as login
- Passw0rd as password

Notes:

1. For security reasons, change the default password immediately after the installation.
2. A pop-up message warns you about security if the password contains less than eight characters.
3. The Login and Password are case-sensitive.
4. The original USERID account login value is fixed (admin) and its Password has to be modified.
5. There is no limit to the number of accounts.

System settings



System settings

Select one of the menu items, and then click the corresponding button on the right:

- **Edit system information**: Enter contact and location information for UPS Power Protector software.
- **Edit language**: Allows the user to change the user language. (Czech, English, French, German, Japanese, Korean, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Traditional Chinese are currently supported.)
- **Edit scan settings**: Changes the default SNMP community name for discovery and enables/disables periodic scan of new nodes.

- **Edit update settings**: Customizes the automatic update feature.

  This feature gives you access to IBM software updates. IBM UPS Power Protector is always up-to-date if you select the **Check automatically** option. When a new software version is detected, follow the wizard instructions.

  Notes:

  1. UPS Power Protector settings are retained with this operation.
  2. UPS Power Manager can manage updates with large number of computers. (See Chapter 5, “Redundancy,” on page 51.)

- **Check for updates**: Checks if a later version of the UPS Power Protector is available on the IBM website.

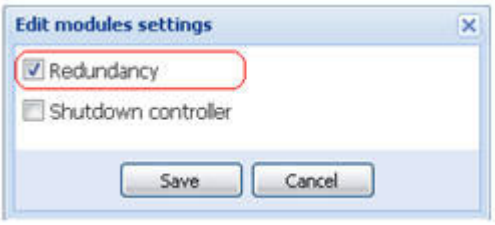
  Note: To obtain information about the latest UPS Power Protector software, you can also go to one of the following websites:
  - For Windows, go to http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPWIN.
  - For Linux, go to http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPLNX.
- **Module Settings**: Enables optional modules (for example, Shutdown Controller).

Shutdown controller

UPS Power Protector can acquire UPS alarms from a UPS (through a USB or RS232 port or from a web/SNMP card or virtual power source) and forward the shutdown alarms to the other IBM UPS Power Protectors. This specific UPS Power Protector is called the *shutdown controller*.

Activating the Shutdown Controller feature

You have to activate the Shutdown Controller feature on the UPP#1 that relays the alarms (connected to the UPS through USB or RS232). This option can be activated by selecting **Settings→System→Module Setting**. Double-click on **Module settings**, then select the check box.



When this feature is activated on one UPS Power Protector:

- A new view called Notified Applications is displayed in the menu of the Shutdown Controller UPS Power Protector and the UPS Power Protector top banner is updated with this graphical sign:

  
- Other UPS Power Protectors discover this UPS Power Protector through a network scan.

  From these other UPS Power Protectors, configure the parameters in **Setting→Shutdown→Configuration**. The following are the main parameters:
  - Power source (Indicate the IP address of UPP#1 that is the Shutdown Controller)
  - Load Segment
  - Login and Password (You must use an account with an admin profile.)

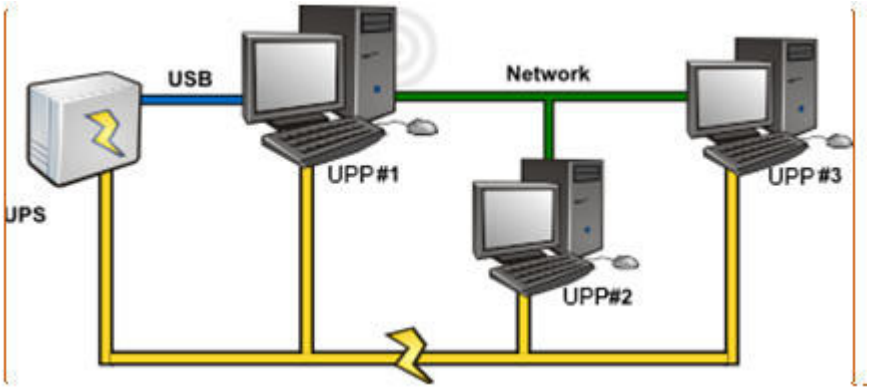
  Click **Save**. The UPS Power Protector is registered in the Notified Application view of the Shutdown Controller. (See Chapter 4, “Monitoring devices,” on page 37.)

Example with three computers (see "Architecture 3 (network-attached UPS through shutdown controller)" on page 23):

When this feature is activated on one UPS Power Protector:

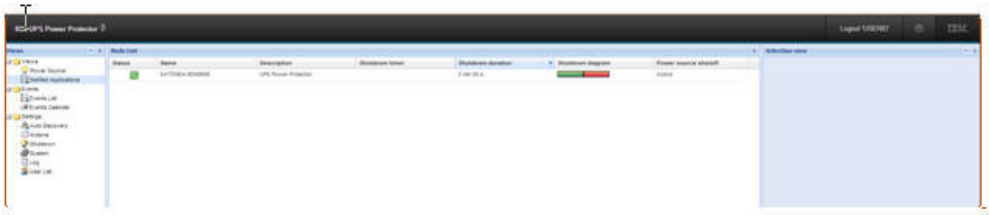
- The UPP#1 automatically detects its UPS.
- The user has to activate the Shutdown Controller feature for UPP1.
- In the UPP2 interface, the user has to indicate the IP address of the UPP1 computer, the load segment, and UPP1 Login and Password.
- In the UPP3 interface, the user will have to indicate the IP address of UPP1 computer, the load segment and UPP1 Login /Password.
- UPP#1 forwards Shutdown alarms to remote UPPs (UPP2) (UPP3).
- As a consequence, the three servers powered by this UPS are protected.

The following illustration shows the corresponding power flow view where there is one UPS that powers three servers fed by only one power supply.



Notified Application view

The Notified Application view is displayed when the Shutdown Controller feature is activated. When the user selects a line, the panels on the right are refreshed according to the selection.



Notified Applications View

Status:

- A green icon indicates that communication is OK between the Local and Remote UPS Power Protector.
- A grey icon indicates that communication is lost between the Local and Remote UPS Power Protector.

Shutdown diagram:

The shutdown diagram is a time illustration of the shutdown sequence of the selected computer. It is a visual representation of the shutdown sequencing between the different computers.

- The total width is the time remaining to empty of the power source (in case a power failure happens or is in progress).
- The green part is the runtime to shut down duration of the computer.
- The orange part represents the computer shutdown duration.
- The red part is the computer off time.

Note: The Notified Applications list is persistent.

The status of this remote UPS Power Protector changes from OK  to Communication Lost  if you uninstall a remote UPS Power Protector or if there is a communication lost event between the shutdown controller UPS Power Protector and the remote UPS Power Protector. With this mechanism the IT administrator is able to monitor any change in the IT distributed architecture. You can manually remove the UPS Power Protectors from this list by selecting **Autodiscovery→Remove Nodes**.

Chapter 4. Monitoring devices

This chapter provides information about the monitoring features that are available with the UPS Power Protector software.

Accessing the monitoring interface

To monitor the power source, start the main UPS Power Protector interface. You can access the UPS Power Protector interface locally or remotely.

Local access

From the system where the UPS Power Manager software is installed, click **Start -> Programs -> IBM -> UPS Power Manager ->Open IBM UPS Power Manager**.

From a local computer, type the following URL in a web browser:

`https://127.0.0.1:4680/`

or

`http://127.0.0.1:4679/`

Remote access

To access UPS Power Protector remotely, use one of the following methods:

- From a remote computer, you can type the following URL in a web browser
  `https://`*`name_or_IP_address_of_computer_hosting_UPP`*`:4680/`
  or
  `http://`*`name_or_IP_address_of_computer_hosting_UPP`*`:4679/`
- In SSL mode, to accept the certificate, click **Yes**.

Accepting the SSL Certificate

For Internet Explorer 7 on the Microsoft Vista operating system only.

To install the certificate on Internet Explorer for Microsoft Vista, complete the following steps:

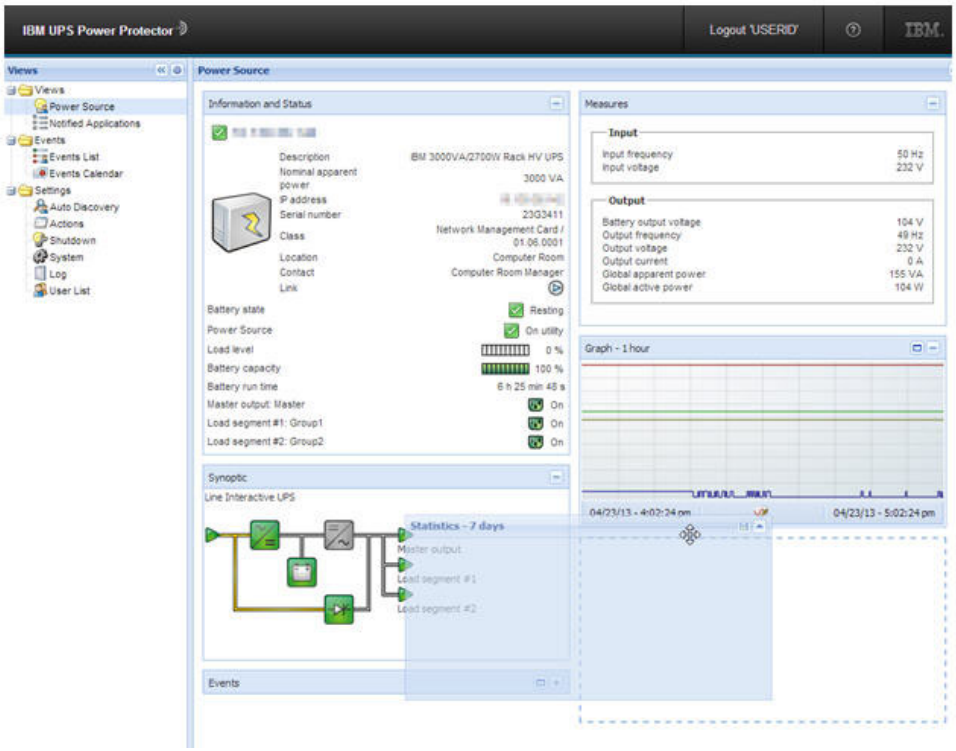
1. Run Internet Explorer 7 as an administrator (right-click the desktop icon).
2. Go to the web address of the UPS Power Protector software, which is the name or IP address of the computer that is hosting the UPS Power Protector software.

3. Click through the certificate error.
4. Click **Certificate Error** in the address bar.
5. Click **View Certificate**.
6. Click **Install Certificate**.
7. Click **Place all certificates in the following store** and select **Trusted Root Certification Authorities** store. If you do not do this, the certificate goes in your personal store, and it is not trusted by Internet Explorer.

- Enter the login and password.

Power Source view

From the Views menu, select **Power Source**. To monitor the information from the UPS that powers the IBM UPS Power Protector computer, you can drag and drop the panels in the window.

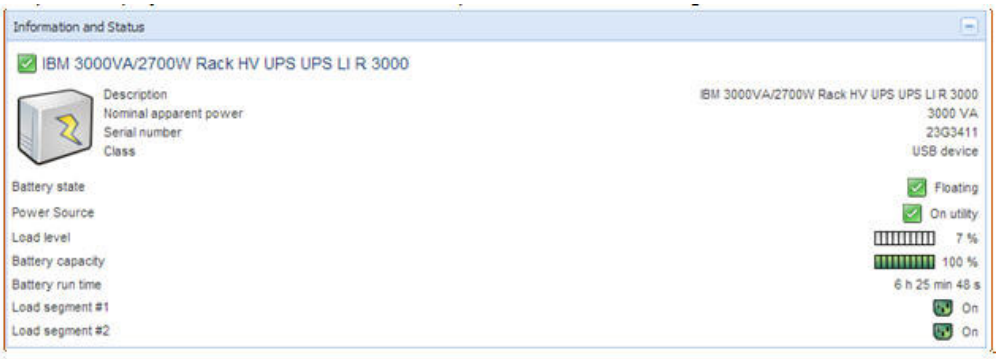


Panels list

This section describes the panels that are available in the Selection view.

Information and Status

The Information and Status panel displays information about the device that powers the server that is running UPS Power Protector.



Information Panel

The following node information is displayed in this panel:

166.99.224.121
The DNS name (or IP address) is displayed near the status icon.

Description
The commercial product name.

Nominal apparent power
The UPS nominal apparent power (in VA or KVA).

IP address
The Web/SNMP card IP address (if network acquisition).

Mac address
The Web/SNMP card MAC address (if network acquisition).

Location
The device location (the value of the syslocation object or it can also be configured on the Device page).

Contact
The device contact (the value of the syscontact object or it can also be configured on the Device page).

Serial number
The device serial number (if available).

Link The link to the device website (if available).

Battery state
The states are Charging, Discharging, Default, Floating, or Resting.

Power source
The power source is ac power or battery.

Load level
The output load level of the device.

Battery capacity
The battery capacity of the device.

Battery run time
The device remaining backup time.

Master output
The main output status (On/Off, Internal Failure, On Automatic Bypass, Manual Bypass, or Overload).

Group #x
The output outlet status (On/Off).

Note: The information that is displayed on the Information and Status panel depends on the node capabilities.

Measures

The Measures panel displays the selected device electrical parameters (single phase or 3 phases), depending on the node capabilities.

The following illustration shows an example of the Measures panel for a single phase UPS.

Environment

The Environment panel displays the selected device sensor information as shown in the following illustration.

Note: This panel is available only when the source is a Web/SNMP card.

The Environment panel displays the following information:

Temperature
Sensor temperature (in °C)

Humidity
Humidity level

Input #1
Status of first contact (open / closed)

Input #2
Status of second contact (open / closed)

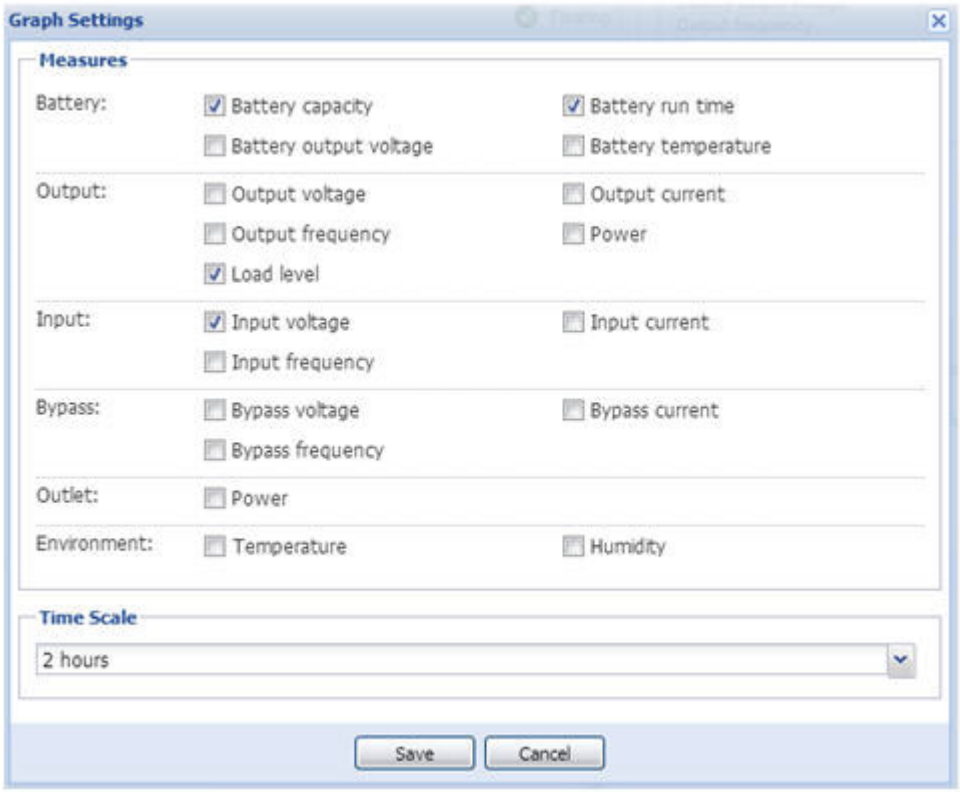
Graph

The Graph panel displays the graph of the main measures of the selected device.

To read the values, place the mouse cursor over the graph, a vertical line is displayed over it and you can read the values in the box for the selected date.

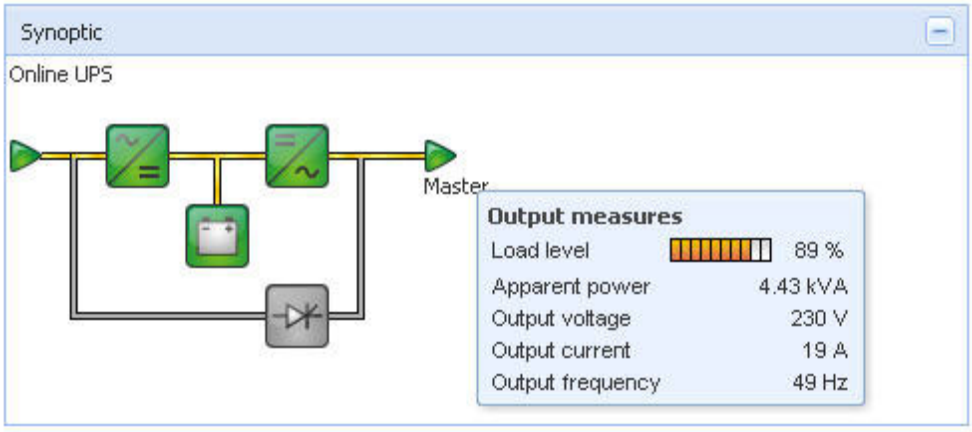
To zoom in on the graph, click . To select the data that you want to display in the graph, click .

In the Graph Settings window, you can select up to 6 measures simultaneously. Time scale possible values are 1 hour / 2 hours / 6 hours / 12 hours / 24 hours / 2 days / 1 week.



Synoptic

The Synoptic panel displays the selected device synoptic. In the top left corner, the UPS electrical topology is indicated (for example, Online UPS or Line Interactive UPS). A tool tip is displayed when the mouse is over one of the functional blocks.



The synoptic color codes are described in the following tables.

Table 1. UPS modules

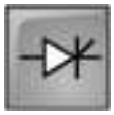
AC/DC	DC/AC	Bypass	Color	Description
			Green	Status OK and Active
			Red	Internal fault and Inactive
			Gray	Status OK and Inactive or Unknown

Table 2. Battery module

Symbol	Color	Description
	Green	Status OK
	Orange	Battery charge is less than 50%
	Red	Battery fault, End-of-backup, or End-of-battery-service-life pre-alarm
	Gray	Battery status unknown

Table 3. Electrical flows

Symbol	Color	Description
	Yellow	Current flow through the cable **Note:** The object animation gives the direction of the current flow.
	Gray	No current flow through the cable. **Attention:** The cable might still have voltage.

Table 4. Electrical power source at UPS input

Symbol	Color	Description
	Green	Source powered. Status OK
	Gray	Source not powered or status unknown
The following examples show combinations between flow status and power source status.		

Table 4. Electrical power source at UPS input (continued)

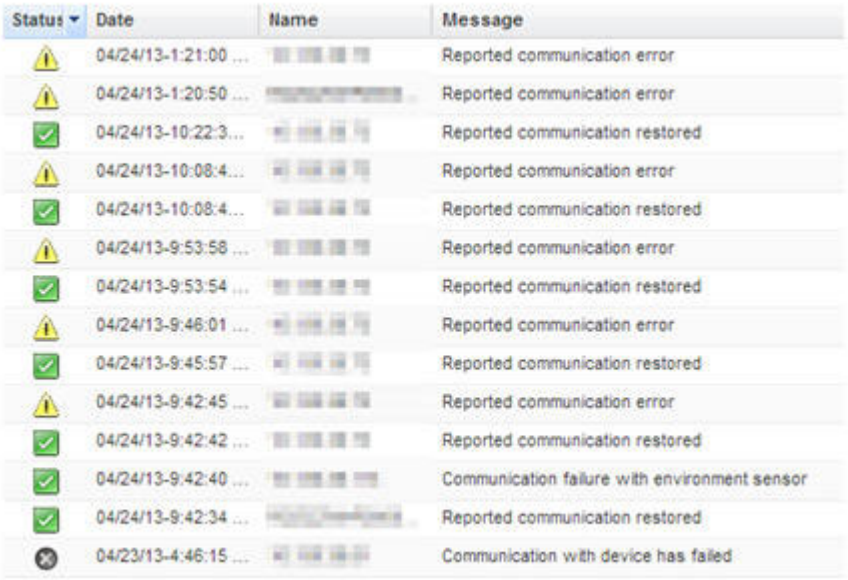
Symbol	Color	Description
	Green/ Yellow	The electrical power source is powered and provides electrical flow.
	Green/Gray	The electrical power source is powered and does not provide electrical flow.

Table 5. Load at UPS output (its status is linked to the UPS output status)

Symbol	Color	Description
	Green	Load powered and protected. Status OK
	Red	Load not powered
	Gray	Load status unknown
The following examples show combinations between flow status and load status.		
	Yellow/ Green	Load powered and protected
	Gray/Red	Load not powered

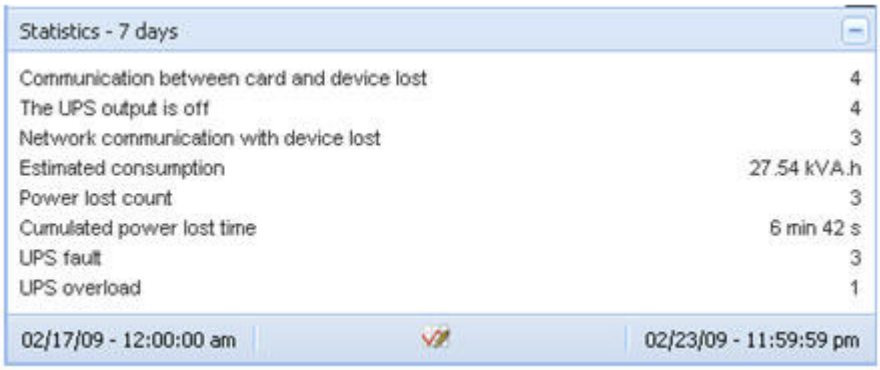
Events

The Events panel displays the events list of the selected node. You can sort the events according to Status, Date, and Message by clicking on the column header.



Statistics

The Statistics panel displays the statistics of the selected node.



To select the time interval for the statistics, click . To adjust the time interval, click the From and To dates.

The following list shows the statistics computed data information:

- Apparent Consumption (or Active Consumption in next release)
- Average Apparent Power (or Average Active Power in next release)
- Power Failure Count
- Power Failure Cumulated Duration
- Battery Fault Count
- Internal Failure Count
- Overload Count
- Warning Alarm Count
- Critical Alarm Count
- Output Off Count
- Communication Lost Count

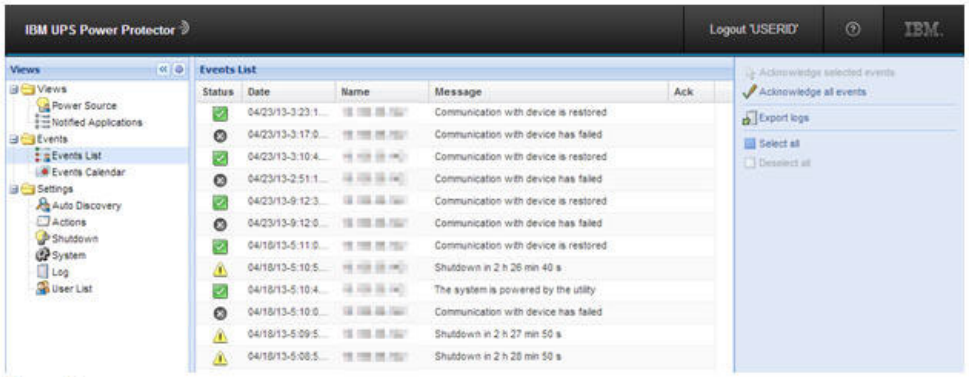
Note: The statistics computed data information depends on the device capabilities.

Events

The following sections describe the Events menu options.

List representation

To open the alarms list, click **Events -> Events List**.



Alarms list.

Buttons on the bottom toolbar enable filtering on unacknowledged alarms of the corresponding level.

All new alarms are stored in this log.

You can sort the alarms according to Status, Date, Name, Message, and Ack.

The following functions are available:

Acknowledge selected events adds a check box in the **Ack** column for selected events.

Acknowledge all events adds a check box in the **Ack** column for all events.

Note: When an alarm is acknowledged, it is marked with a checkbox but it is still viewable in this Event list. It decreases the number of non acknowledged alarms at the bottom of the web page. The acknowledged alarms are not displayed if you click **Power Source -> Event panel.**

Export Logs creates a logs.csv file with the following syntax:

```
"Date";"Node";"Type";"Level";"Object";"Value";"Message";
"2009/01/27-18:35:20.840";"166.99.250.83";"Measure";"0";"UPS.PowerConverter.
Input[1].Frequency";"49";"";
```

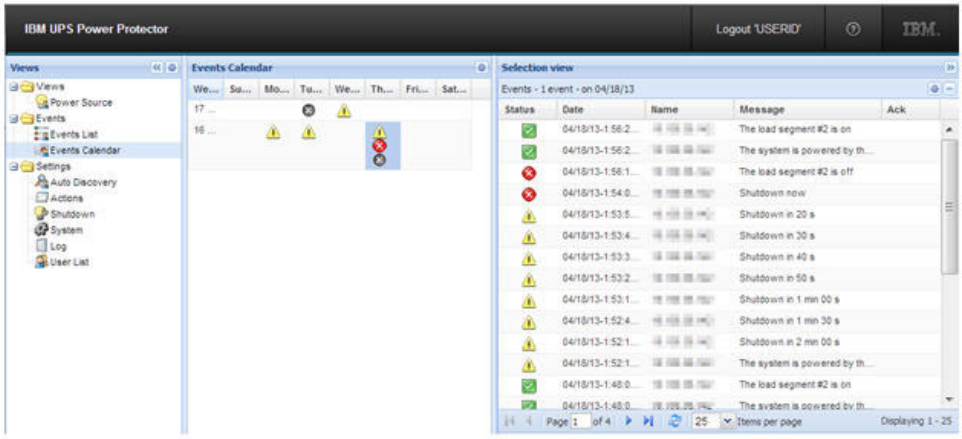
Select all selects all displayed events.

Deselect all deselects all selected events.

Tips: You can select one alarm by clicking on it. You can select several alarms with Shift+click or Alt+click. Then, the selected lines are displayed in dark blue.

Calendar representation

To open the events calendar, click **Events -> Events Calendar**.



In this matrix representation, each line is a week and each column is a day of the week. If you select a day or an interval (with the date selector or press Shift and click), the Events and Statistics panels display the information for the selection and automatically refresh when new statistics are computed.

Nodes Events list

The tables in this section describe the icons and event status. The icons in the different views represent the event severity.

Table 6. Uninterruptible power supply status icons

Icon	Event status
	**Normal.** With this event, the device is returning to a normal status. **Event list (UPSs):** • Communication with device is restored • Communication restored with UPS • The system is powered by the utility • The UPS output is on • Communication restored with UPS • Battery OK • UPS returns to normal load • UPS OK • Bypass : Return on UPS • End of low battery alarm • The outlet group 1 is on • The outlet group 2 is on • Communication failure with environment sensor • Communication restored with environment sensor • Humidity is in normal range • Temperature is in normal range • Input #x on • Input #x off • End of warning alarm • End of critical alarm • Redundancy restored • Protection restored
	**Warning.** A problem occurred on the device. The application is still protected. **Event list (UPSs):** • The system is powered by the UPS battery • Output on automatic bypass • Output on manual bypass • Humidity is below low threshold • Humidity is above high threshold • Temperature is below low threshold • Temperature is above high threshold • Warning Alarm (a generic Warning alarm is active on the device) • The device is under its load alarm threshold • The device is over its load alarm threshold • Protection lost • Redundancy lost • Shutdown in {time} • Remote Communication Error (remote communication or configuration issue is detected)

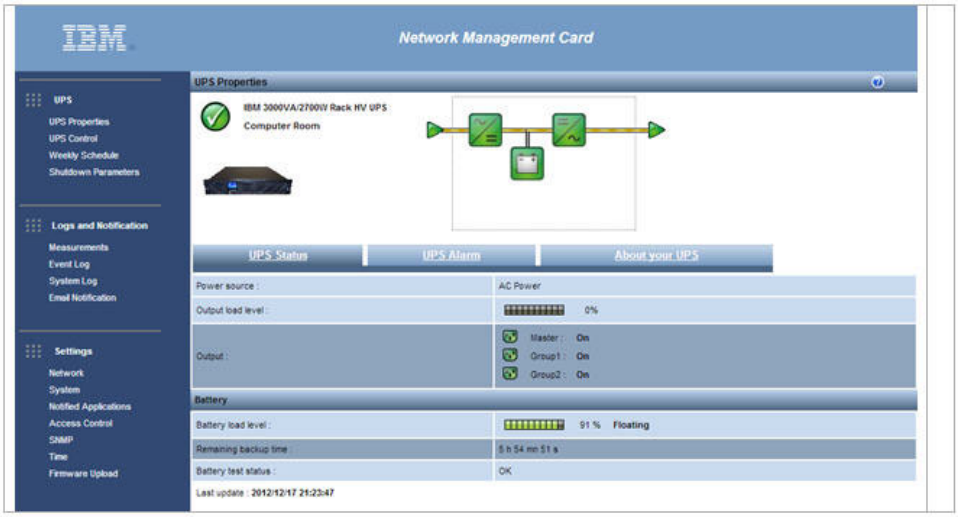
Table 6. Uninterruptible power supply status icons (continued)

Icon	Event status
	**Critical.** A serious problem occurred on the UPS device. This problem requires an immediate action. The application might not be powered anymore. **Event list (UPSs):** • The UPS output is off • The outlet group 1 is off • The outlet group 2 is off • Battery fault • UPS overload • UPS fault • Low battery alarm • Applications must stop immediately • System shutdown in progress • Critical alarm (a generic Critical alarm is active on the device)
	Communication lost **Event list:** Communication failure with a device or application

Launching the web interface for a device

From the Status panel, you can access the web interface for the IBM Network Management Card, including an integrated web server. Click the web link associated with this blue icon (http access) or this yellow icon (https access).

The following illustration shows an example of opening different web interfaces from IBM UPS Power Protector.



Opening different Web interfaces from IBM UPS Power Protector

Chapter 5. Redundancy

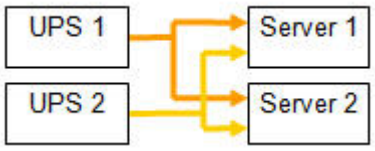
This chapter provides information about using the redundancy features of UPS Power Protector.

Introduction

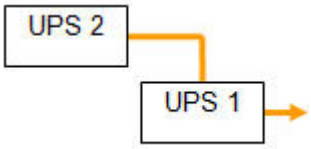
UPS Power Protector provides management for composite devices. Composite devices are virtual nodes composed of uninterruptible power supplies (UPSs) that are mounted with specific redundancy topologies(Redundant Supplies, Hot Standby or Static Transfer Switch for two components and Parallel for two or more components) and a dedicated redundancy level.

The electrical redundancy topologies are described in the following list:

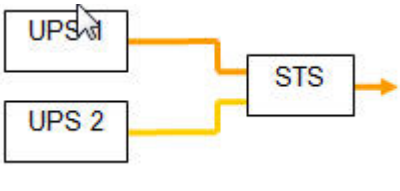
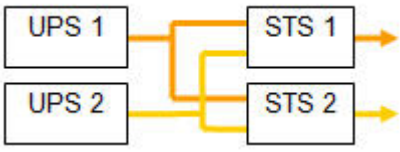
- Redundant supplies (dual feed or triple feed)

	In this case, the two UPSs provide power on one or several multiple feed servers.

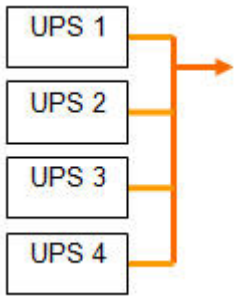
- Hot standby

	For Hot Standby mode, when the upstream UPS powers the load, the downstream UPS is on bypass.

- Static Transfer Switch for two components

 	For Static Transfer Switch (STS) mode, there are several cases with a single STS or multiple STSs.

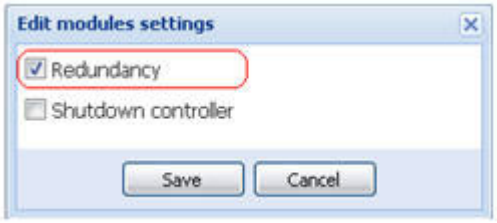
- Parallel for two or more components

	All the UPSs power the load at the same time.

To enable the redundancy feature, click **Settings -> System -> Modules Settings**. IBM UPS Power Protector will then shutdown a local computer that is powered by several UPSs (composite device).

UPS Power Protector can perform the following tasks:

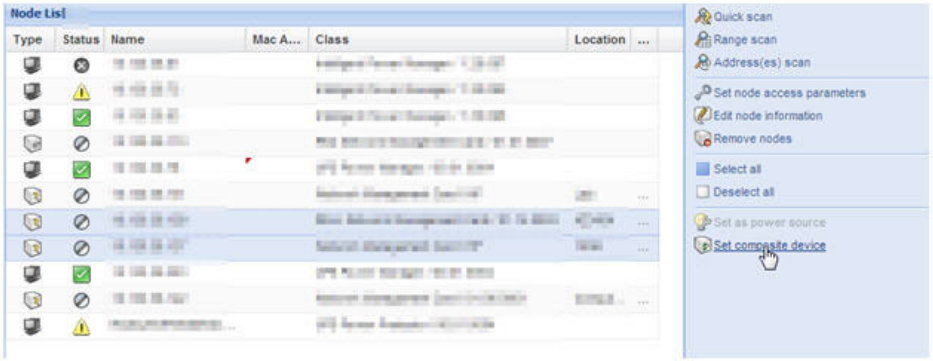
- Supervise composite devices (if the Redundancy feature is activated)
- Shutdown the UPS Power Manager computer when powered by several UPSs (if the shutdown feature is also activated).



Redundancy configuration

To configure redundancy, complete the following steps:

1. Log in with an administrator user profile.
2. Select two or more nodes and click **Set composite device** from the left menu.



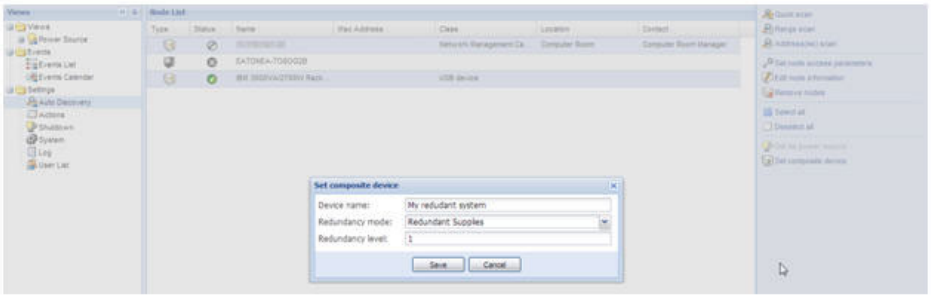
3. In the window, enter the following values:

   Device name User name of the composite device

   Redundancy mode
   To select the correct electrical topology (Parallel / Redundant Supplies / Hot Standby / Static Transfer Switch), see “Introduction” on page 51.

   Redundancy Level
   The minimum number of redundant UPSs powering the system. The default is 0.

   If you set this parameter to a higher level, you will receive the Redundancy Lost alarm when you do not have enough redundant UPSs.



The new node is created and you can see it in the Auto discovery node list. You can perform the following actions:

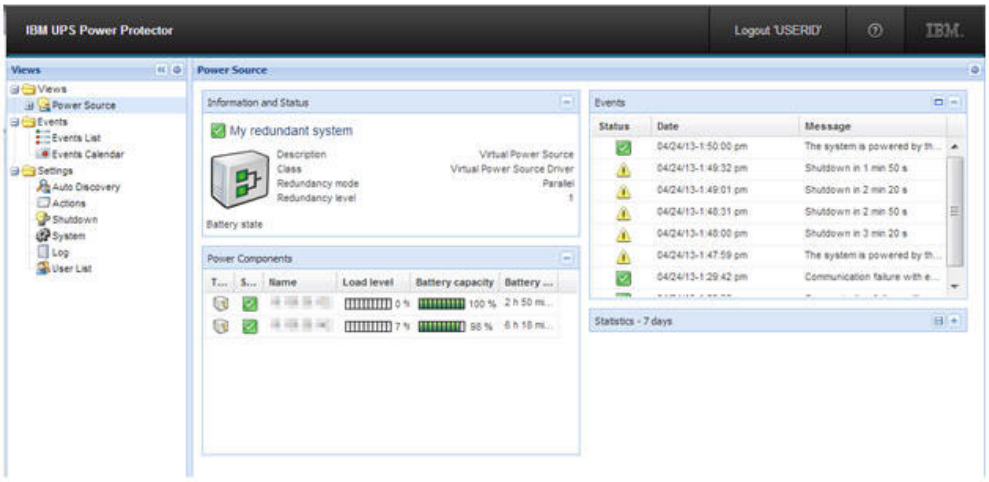
- Select the node as a power source.
- Edit the composite device properties by selecting the node in the discovery view and click **Set composite device** from the left menu.
- If you select components of a composite device and click **Set composite device** again, the properties of existing composite devices are shown; no new composite device is created; therefore, no composite device duplication is possible.

Redundancy views

The Redundancy views are described in the following sections.

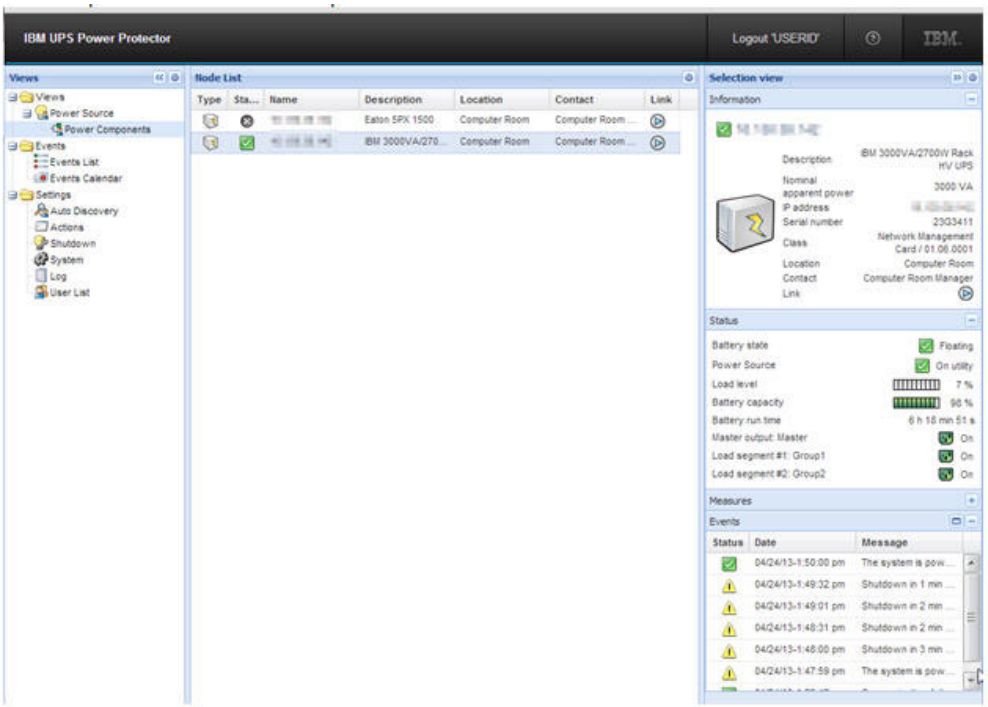
Composite device in Power Source view

When a Redundancy module is activated, a composite device can be selected as a power source. You can show this in the Power Source view. In this case, Information, Status, Events, and Power components panels are displayed with specific data.



Power components sub view

When a Redundancy module is activated, a new view called “Power components” is available as a sub view of “Power source”. This view shows a list of nodes with their properties, but it displays only the components of the selected power source, if it is a composite device.

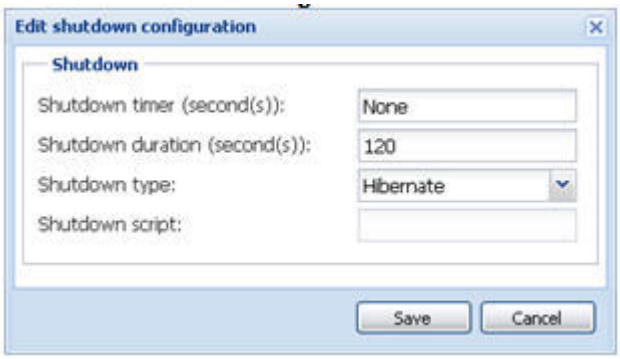


Redundancy use cases (if shutdown is activated)

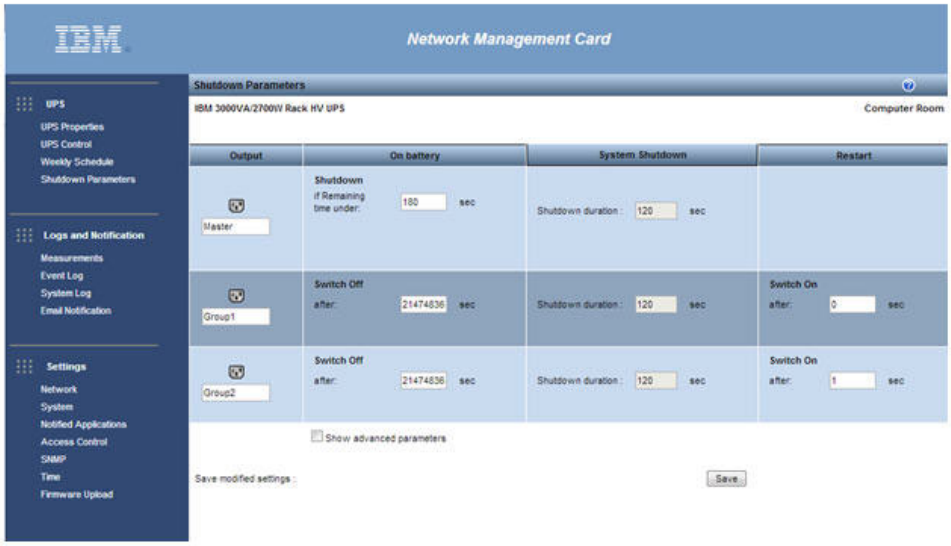
This section provides several typical use cases that can help you configure the redundant shutdown sequence according to your needs.

Use case 1: You want to schedule the longest backup time with the redundant configuration.

This use case is the default UPS Power Protector configuration. To view the default configuration, click **Settings -> Shutdown -> Edit Shutdown Configuration**.

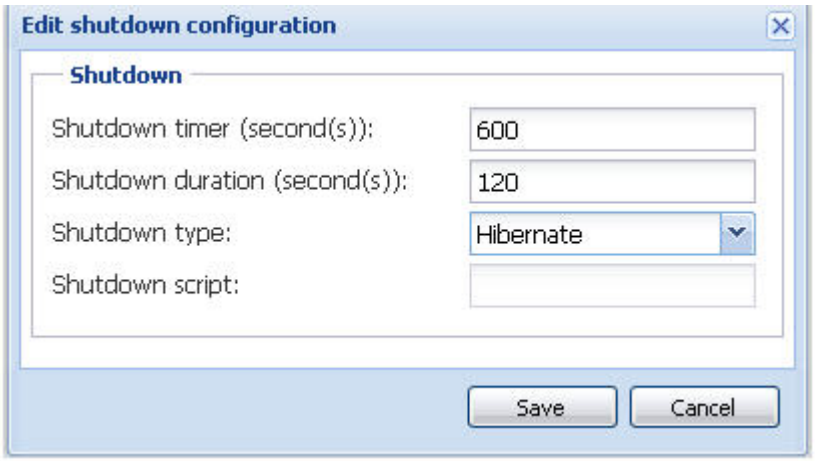


The following illustration shows the default configuration on the web/SNMP card. To open the Shutdown Parameters page, click **UPS -> Shutdown Parameters**.



Use Case 2: You want to schedule a shutdown after a predefined time of 10 minutes. The shutdown has to occur even if only one UPS is on battery. In this case, each server can have its own shutdown timer (for example 10 minutes, 8 minutes, or 6 minutes).

The following illustration shows an example shutdown timer of 10 minutes. From the UPS Power Protector window, click **Settings -> Shutdown -> Edit Shutdown Configuration**.

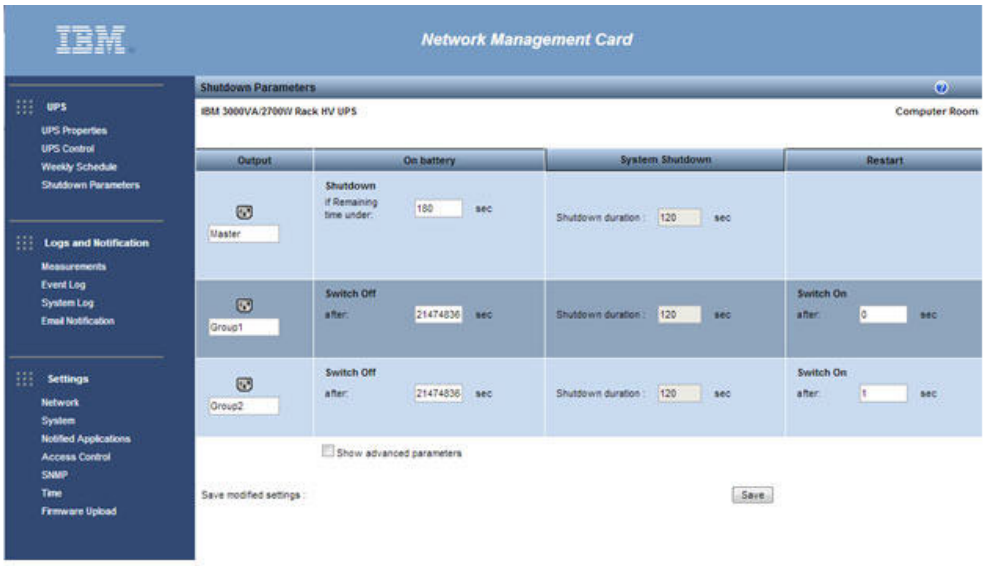


Note: This is the default configuration on the web/SNMP card.

Use Case 3: You want to schedule a shutdown starting 10 minutes from the last detected Utility failure event. For this example, there are two UPSs, one of them is redundant. In this case, all servers shutdown at the same time. This is the default configuration in UPS Power Protector.

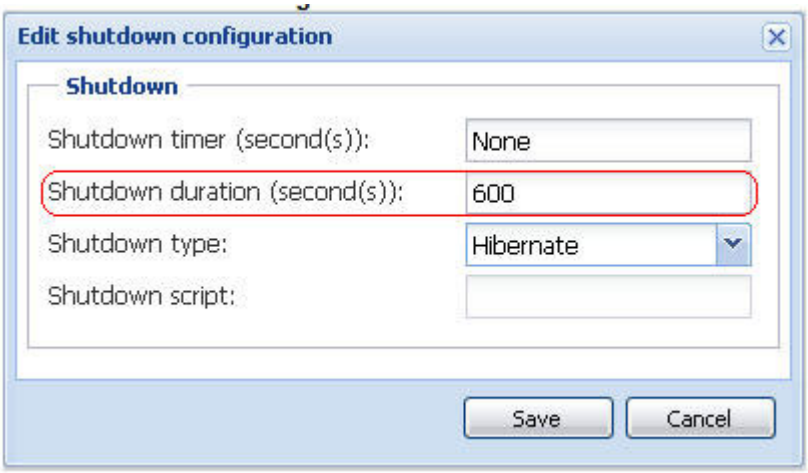
To schedule the same shutdown configuration for the web/SNMP card, you have to configure a shutdown timer of 10 minutes in all the web/SNMP cards. In this case, the last UPS sends the shutdown order after 10 minutes, if it runs on battery. If the last UPS never runs on battery, the first UPS will simply shutdown at the end of autonomy and the last UPS takes the load (if it has the capacity; otherwise, the shutdown occurs sooner). To open the Shutdown Parameters page, click **UPS ->**

Shutdown Parameters. The Shutdown Parameters page is shown in the following illustration.



Use Case 4: You want to schedule a shutdown when the remaining time of the last UPS is 10 minutes. In this case, each server can have its own shutdown duration (for example, 10 minutes, 8 minutes, or 3 minutes).

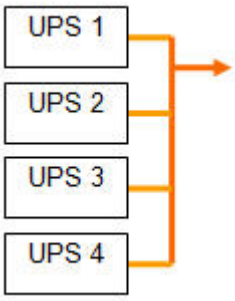
To schedule a shutdown duration of 10 minutes in UPS Power Protector, click **Settings -> Shutdown -> Edit Shutdown Configuration**, as shown in the following illustration.



Note: This is the default configuration on the web/SNMPcard.

Redundancy advanced behavior example

This section shows redundancy examples. For each example, there are four parallel UPSs. Each UPS is 20 kW. For this parallel topology, the load can vary between 0 and 80 kW.



Redundancy alarm management with four modules

For this example, the user defined redundancy level and load have the following information:

- R is the number of redundant UPSs
- Status of redundancy lost alarm

Table 7. Redundancy alarm management with four modules

Load / redundancy level	**Load < 20 kW**	**20 kW < Load < 40 kW**	**40 kW < Load < 60 kW**	**60 kW < Load < 80 kW**
0	R=3	R=2	R=1	R=0
1	R=3	R=2	R=1	R=0 -> Redundancy Lost active
2	R=3	R=2	R=1 -> Redundancy Lost active	R=0 -> Redundancy Lost active
3	R=3	R=2 -> Redundancy Lost active	R=1 -> Redundancy Lost active	R=0 -> Redundancy Lost active

Protection alarm management with four modules

For this example, the following load and number of failed UPSs are used:

- P is the number of UPSs protecting the load
- R is the number of redundant UPSs
- Status of protection lost alarm

Table 8. Protection alarm management with four modules

Load / failures	**Load < 20 kW**	**20 KW < Load < 40 kW**	**40 kW < Load < 60 kW**	**60 kW < Load < 80 kW**
No failure	P=4; R=3	P=4; R=2	P=4; R=1	P=4; R=0
1 failure	P=3; R=2	P=3; R=1	P=3; R=0	P=3; R=0 -> Protection Lost active
2 failures	P=2; R=1	P=2; R=0	P=2; R=0 -> Protection Lost active	P=2; R=0 -> Protection Lost active
3 failures	P=1; R=0	P=1; R=0 -> Protection Lost active	P=1; R=0 -> Protection Lost active	P=1; R=0 -> Protection Lost active
4 failures	P=0; R=0 -> Protection Lost active	P=0; R=0 -> Protection Lost active	P=0; R=0 -> Protection Lost active	P=0; R=0 -> Protection Lost active

Chapter 6. Advanced management

Use the UPS Power Manager application to perform the following tasks remotely:

- Display an IBM UPS Power Protector: configuration.
- Configure a single IBM UPS Power Protector.
- Synchronize multiple IBM UPS Power Protector configurations.
- Trigger the IBM UPS Power Protector Upgrade.

To download the IBM UPS Power Manager software and documentation, go to http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPMWIN.

Chapter 7. Compatibility list

UPS Power Protector is supported on the devices that are described in the following sections.

IBM serial line devices

Product name	Connectivity
IBM 3000 VA LCD 3U Rack	USB or RS232
IBM 6000 VA LCD 4U Rack UPS	USB or RS232
IBM 11000 VA LCD 5U Rack	USB or RS232

IBM network devices

Product name	Card/proxy	Features
IBM UPS Network Management Card (46M4110)	Network Card	Quick Scan Supervision

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM® products, you will find a wide variety of sources available from IBM to assist you. Use this information to obtain additional information about IBM and IBM products, determine what to do if you experience a problem with your IBM system or optional device, and determine whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated firmware and operating-system device drivers for your IBM product. The IBM Warranty terms and conditions state that you, the owner of the IBM product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your IBM service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
- If you have installed new hardware or software in your environment, check http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/ to make sure that the hardware and software is supported by your IBM product.
- Go to http://www.ibm.com/supportportal/ to check for information to help you solve the problem.
- Gather the following information to provide to IBM Support. This data will help IBM Support quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.
  - Hardware and Software Maintenance agreement contract numbers, if applicable
  - Machine type number (IBM 4-digit machine identifier)
  - Model number
  - Serial number
  - Current system UEFI and firmware levels
  - Other pertinent information such as error messages and logs
- Go to http://www.ibm.com/support/entry/portal/Open_service_request/ to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to IBM Support quickly and efficiently. IBM service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that

contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/supportportal/. Also, some documents are available through the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

Getting help and information from the World Wide Web

On the World Wide Web, up-to-date information about IBM systems, optional devices, services, and support is available at http://www.ibm.com/supportportal/. The address for IBM System x® information is http://www.ibm.com/systems/x/. The address for IBM BladeCenter® information is http://www.ibm.com/systems/bladecenter/. The address for IBM IntelliStation® information is http://www.ibm.com/systems/intellistation/.

How to send Dynamic System Analysis data to IBM

Use the IBM Enhanced Customer Data Repository to send diagnostic data to IBM. Before you send diagnostic data to IBM, read the terms of use at http://www.ibm.com/de/support/ecurep/terms.html.

You can use any of the following methods to send diagnostic data to IBM:

- **Standard upload:** http://www.ibm.com/de/support/ecurep/send_http.html
- **Standard upload with the system serial number:** http://www.ecurep.ibm.com/app/upload_hw
- **Secure upload:** http://www.ibm.com/de/support/ecurep/send_http.html#secure
- **Secure upload with the system serial number:** https://www.ecurep.ibm.com/app/upload_hw

Creating a personalized support web page

At http://www.ibm.com/support/mynotifications/, you can create a personalized support web page by identifying IBM products that are of interest to you. From this personalized page, you can subscribe to weekly email notifications about new technical documents, search for information and downloads, and access various administrative services.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with your IBM products. For information about which products are supported by Support Line in your country or region, see http://www.ibm.com/services/supline/products/.

For more information about Support Line and other IBM services, see http://www.ibm.com/services/, or see http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to http://www.ibm.com/partnerworld/ and click **Find Business Partners** on the right side of the page. For IBM support telephone numbers, see http://www.ibm.com/planetwide/. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

IBM Taiwan product service

台灣 IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:
IBM Taiwan Corporation
3F, No 7, Song Ren Rd.
Taipei, Taiwan
Telephone: 0800-016-888

Appendix B. Notices

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Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

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