Eaton® Intelligent Power® Protector (IPP)

User's Guide

E·AT·N

Powering Business Worldwide

Class A EMC Statements

FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ICES-003

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

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

Eaton is not responsible for damage to this product resulting from accident, disaster, misuse, abuse, non-Eaton modification of the product, or other events outside the reasonable control of Eaton or not arising under normal operating conditions.

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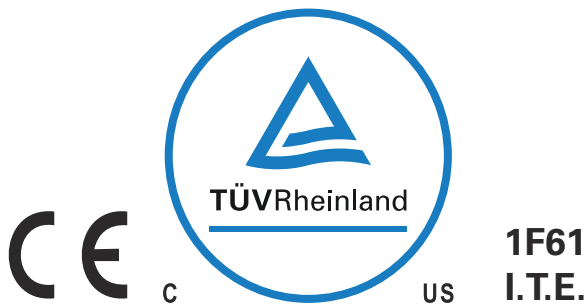
Special Symbols

The following are examples of symbols used on the UPS or accessories to alert you to important information:

RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.

CAUTION: REFER TO OPERATOR'S MANUAL - Refer to your operator's manual for additional information, such as important operating and maintenance instructions.

This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

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Chapter 1 Introduction

Eaton® Intelligent Power® Protector (IPP) is protection software that gracefully shuts down local computers and servers powered by a UPS in the event of a power outage. The Eaton IPP acquires information through local or network communication using:

- **Local Communication:** UPSs USB or RS-232 communication ports (Pulsar and Powerware series)
- **Network Communication:** Web/SNMP Cards, such as Network Management Cards (NMCs), Network-MS, and Modbus-MS, ConnectUPS-X-Slot, Power Xpert Gateway 2000 (PXGX 2000), Power Xpert Gateway (PXGX UPS), and Gigabit Network Card (Network-M2)

The Eaton IPP provides the following:

- Provides local computer graceful shutdown through network or local connectivity
- Allows Eaton Intelligent Power Manager (IPM) to provide centralized management and supervision of Eaton IPP applications running on virtualized servers other than VMware vCenter (such as Microsoft® Hyper-V™ Hypervisor or Citrix® Xen®).
- Allows Eaton IPM to provide advanced management features (mass configuration and mass upload) with the Eaton Network Management Cards (NMCs), Network-MS (example, 66102/103006826), Modbus-MS (example, 66103), and Gigabit Network Card (Network-M2).

Figure 1 shows the Eaton IPP Main Page.
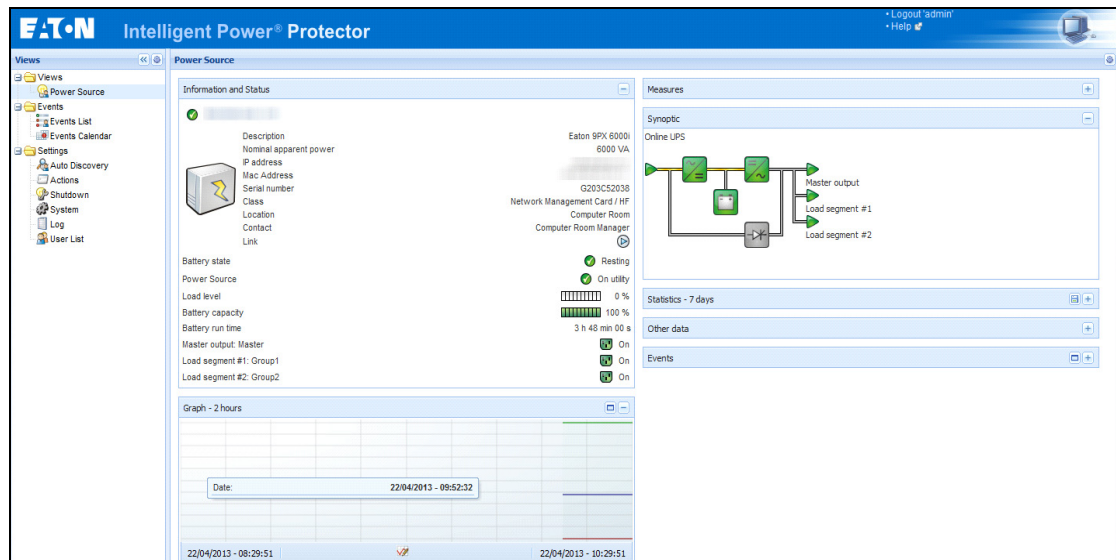
Figure 1. Eaton IPP Main Page

Compatibility

Eaton has tested the compatibility of the Eaton IPP with the following devices and applications.

	NOTE	The ConnectUPS-E card (Powerware series) has not been tested but should be compatible.

	NOTE	If a device doesn't support the Quick Scan feature, it can be supervised if Address Scan or Range Scan operations are performed. See "Discover Nodes Connected on the Network" on page 17 for more information.

Eaton Devices

Table 1. Eaton Devices

Eaton Equipment Designation	Type
Gigabit Network Card (Network-M2)	UPS Option Card
Network Management Card Minislot SNMP / Web - Network-MS (ex 66102; DA firmware revision and above) and associated Environment Sensor	UPS Option Card Eaton Pulsar
Network Management Card & Modbus /JBus -Modbus-MS (ex 66103; through Ethernet Network) and associated Environment Sensor 66846	UPS Option Card Eaton Pulsar
ConnectUPS-Minislot Network Management Card / Network-MS (ex 103006826)	UPS Option Card Eaton Powerware
ConnectUPS-BD Web /SNMP P/N 116750222-001 (**) and associated Environment Sensor	UPS Option Card Eaton Powerware
ConnectUPS-X-Slot Web /SNMP/xHubCard, P/N 116750221-001 (*) (**) and associated Environment Sensor	UPS Option Card Eaton Powerware
PXGX 2000 P/N 103005868-5591 (*) (***)	UPS Option Card Eaton Powerware
PXGX UPS Card	UPS Option Card Eaton Powerware
Legacy: MGE Network Management Card Minislot SNMP/Web - 66244 and associated Environment Sensor	UPS Option Card (legacy)
Legacy: Network Management Card Transverse SNMP/Web - 66074 and associated Environment Sensor	UPS Option Card (legacy)

NOTE 1: Since Intelligent Power Protector 1.10, the Eaton Powerware three-phase UPS compatibility is officially available according to the following solution:

- Cards: ConnectUPS-X v4.32 or PXGX 2000 v1.4.2.1

- UPSs: Blade UPS, PW9155 Dual Phase, PW9355 10-30 kVA, PW9390 40-160 kVA, PW9395 225-1100 kVA & SBM

- Known limitation: PW9315 is not supported by the1.10 release

NOTE 2: Required ConnectUPS-X-Slot/BD configuration:

- Set the IPP Discovery password to the same value as the Web / SNMP read community name (default is public)

- In the ConnectUPS Write Access Manager's control menu (using Telnet, SSH, or a serial connection): disable SNMP access restricted by IP/Hostname (this is the default setting since firmware version 2.02) or configure it correctly. (IPP has to be configured in the trusted host list.)

NOTE 3: Required PXGX 2000 / PXGX UPS configurations:

- Set the IPP Discovery password to the same value as the PXGX read community name (default is public)

- On the PXGX Access control page, disable SNMP access restricted by IP/Hostname or configure it correctly (IPP has to be configured in the trusted host list)

- When using PXGX, take care to configure PXGX in SNMP V1 or SNMP V1 + V3

Serial Line Devices

The Eaton IPP is compatible with the following serial line devices (see Table 2).

Table 2. Serial Line Devices

Eaton Equipment Designation	Connectivity
Eaton Powerware series:	USB or RS-232
Eaton 3105, 5110, 5115, 5130, 9130, 9135, 9140 and legacy 9120, 9125	
Eaton Powerware series:	RS-232 only
Eaton BladeUPS, 5125, 9155, 9355, 9390, 9395	
Eaton Pulsar Series:	USB or RS-232
Evolution 650 / 850 / 1150 / S 1250 / 1550 / S 1750 / 2000 / S 2500 / S 3000	
Pulsar 700 / 1000 / 1500 / 1000 RT2U / 1500 RT2U (INTL. & US Models)	
Pulsar M / EX	
Eaton 5PX, 5P	
Pulsar MX & Pulsar MX Frame 16 U / MX	
Eaton 9PX	
Eaton Pulsar Series:	RS-232 only
EX RT	
Comet EX RT 1:1 / 3:1 / EX 5 RT (Asia/Pacific)	
NOTE Ellipse ASR 600/750/1000/1500 USBS, Ellipse MAX, Protection Station, Protection Center, NOVA AVR, are currently supported by the Eaton UPS Companion software.	

Eaton IPM Management

The Eaton IPP can be remotely managed, configured, and updated using Eaton IPM supervisory software. Using the Eaton IPM, you can perform mass configurations and mass updates of Eaton IPP applications. The Eaton IPM can also remotely perform the following:

- Display an Eaton IPP configuration
- Configure a single Eaton IPP
- Synchronize multiple Eaton IPP configurations
- Trigger Eaton IPP instances upgrade

> **🛈** **NOTE** Refer to the *Eaton Intelligent Power Manager (IPM) User's Guide* for more information. You can evaluate the Eaton IPM by downloading a free trial version that will manage up to 10 nodes.

Network Ports

Table 3 lists the network ports used by the Eaton IPP.

Table 3. Network Ports

Protocol	Mode Port	Eaton Network-MS, NMC	Eaton Gigabit Network Card (Network-M2)	Other Eaton UPS Management Cards *NOTE	Eaton IPP with Shutdown Controller	Eaton IPP and Eaton IPM
SMTP	TCP/25	OUT	OUT	OUT	OUT	OUT
DHCP	UDP/67	OUT	OUT	OUT	X	X
TFTP	UDP/69	IN	X	X	OUT	OUT
HTTP	TCP/80	IN	IN	IN	IN/OUT	IN/OUT

Table 3. Network Ports (Continued)

Protocol	Mode Port	Eaton Network-MS, NMC	Eaton Gigabit Network Card (Network-M2)	Other Eaton UPS Management Cards *NOTE	Eaton IPP with Shutdown Controller	Eaton IPP and Eaton IPM
SMTP/StartTLS	TCP/587	OUT	OUT	X	OUT	OUT
MDNS SD	UDP/5353	X	IN/OUT	X	IN/OUT	IN/OUT
MQTT	TCP/8883	X	IN/OUT	X	IN/OUT	IN/OUT
NTP	UDP/123	OUT	OUT	OUT	X	X
SNMP	UDP/161	IN	IN	IN	OUT	OUT
SNMP Traps	UDP/162	OUT	OUT	OUT	X	X
UNMP	UDP/200	X	X	OUT	IN/OUT	IN/OUT
HTTPS	TCP/443	IN	IN	IN	IN/OUT	IN/OUT
Eaton Supervision	TCP/4679	X	X	X	IN/OUT	IN/OUT
Eaton Notification Broadcast	UDP/4679	IN/OUT	X	X	IN/OUT	IN/OUT
Eaton SSL Supervision	TCP/4680	X	X	X	IN/OUT	IN/OUT
Eaton Alarms Broadcast	UDP/4680	OUT	X	X	IN	IN
Eaton Connected Alarms	TCP/5000	IN	X	X	OUT	OUT
Eaton Connected Alarms	TCP/5001	X	X	X	IN	OUT
IPP-Unix (NUT)	TCP/3493	X	X	X	IN/OUT	IN/OUT

NOTE   Includes PXGX 2000, PXGX UPS, ConnectUPS-BD, ConnectUPS-X-Slot

Troubleshooting

HTML pages
Cannot display the UPS properties page. HTTP 404 error with IE.

Solution:
Check the URL entered.

> https://<name or IP of the computer hosting Eaton IPP>:4680/
> - or -
> http://<name or IP of the computer hosting Eaton IPP>:4679/

Ubuntu's Software Center
The package is of bad quality

Solution:
This is a known issue specific to Ubuntu Software Center. Click the "ignore and install" button.

Linux Graphical System Integration
Linux, Debian, and Ubuntu, with Gnome™: "Open" shortcut is not present

Solution:
The menu shortcut will appear the next time you launch Gnome.
In the meantime, open a Web browser and enter the following URL:
http://localhost:4679/

Linux OpenSUSE 11, with KDE: "Open" shortcut is not visible

Solution:

To find the IPP icon, use the Search function from the Application Menu. You should then find the Eaton IPP icon in the Favorites section.

Linux Red Hat, OpenSUSE and Mandriva: Notification icon (system tray icon) is not started upon installation or upgrade

Solutions:

Launch the following command, as your standard user, from a terminal or using a Launch feature:

$ /usr/local/Eaton/IntelligentPowerProtector/mc2 -systray

If you launch this command from a terminal, add an ampersand (&) at the end of the command line in order to detach the process.

Close your graphical session and log into a new one. The notification icon automatically starts with the new graphical session.

Linux Unity desktop: "Open" shortcut is not present

Solutions:

Open a terminal and type the following line:

> sudo xdg-desktop-menu install --novendor

/usr/local/Eaton /IntelligentPowerProtector/desktop/Eaton.directory /usr/local/Eaton/ IntelligentPowerProtector/desktop/IPP.directory /usr/local/Eaton/IntelligentPowerProtector/desktop/ Open.desktop

Type "open" in the search box of the Unity Menu to retrieve the "Open" shortcut.

Open a Web browser and type the following URL:

http://localhost:4679/

Linux Network System Integration

Network proxy not detected

	NOTE	If your network proxy was not detected during installation, you will not be able to access automatic updates and other Internet resources from the Eaton IPP. This can be validated by the absence of "proxy.cfg" under /usr/local/Eaton/ IntelligentPowerProtector/configs/

Solution:

Create a file named "proxy.cfg" under /usr/local/Eaton/IntelligentPowerProtector/configs/ with the following content:

{

  'proxyHost': "your.proxy.address.com",

  'proxyPort': "proxy_port"

}

For example:

```
{
  'proxyHost': "proxy.domain.com",
  'proxyPort': "8080"
}
```

Then, restart the Eaton IPP to reload the configuration.

When Activating Shutdown Controller under Linux

When you enable the Shutdown Controller optional module, a problem in the Eaton IPP service initialization occurs on Linux.

Solution:

The issue can be easily solved by restarting the Eaton IPP daemon once the "Shutdown Controller" module has been activated. There is no need to restart the Eaton IPP daemon when disabling this feature.

Events and Actions with Some Windows x64 bits OS

When the shutdown command is called from the Eaton IPP context, the system doesn't find it because it searched in C:\Windows\SysWOW64, even if the specified path is explicitly C:\Windows\System32\shutdown.exe.

> **NOTE** This is a problem of some Windows x64 OS versions (e.g. XP x64 and 2003 x64). For example, this problem doesn't appear on Windows 7 x64.

Solution:

Retrieve "shutdown.exe" from the C:\Windows\System32\ folder and copy it into D:\IPP\ for example. Then modify "shutdown.bat" to explicitly call D:\IPP\shutdown.exe

Shutdown Sequence

A PW 9130 UPS doesn't shut off as expected when IPP is connected through a USB/Serial connection and when a Web SNMP card is installed.

Solution:

Disable the UPS shutoff command from the card interface to ensure a proper shutdown by Eaton IPP.

Go to the "Configuration/UPS Shutdown and Restart Settings" page of the card and select "No" for the parameter "Load Segment to Turn Off after OS Shutdown."

> **NOTE** If you have chosen to use the USB/serial connector for communication between IPP and your UPS which also has a web card inside, it is better to disable the shutdown criteria of the card to ensure the shutdown and the restart of your machine.

Terms

This section provides related terms and definitions.

IP Address

When Transmission Control Protocol / Internet Protocol (TCP/IP) is installed on a computer, an Internet Protocol (IP) address is assigned to the system. Each address is unique and is made up of four numbers, each between 0 and 255, such as 168.8.156.210.

Secure Socket Layer

The Secure Socket Layer (SSL) is a solution for securing transactions over the internet. SSL is a communication protocol that authenticates the data exchanged, as well as ensuring its confidentiality and integrity. The protocol uses a recognized encryption method, the RSA algorithm with a public key. SSL is built into Internet Web browsers. The padlock at the bottom of your browser screen automatically displays if the server sending information uses SSL.

Transmission Control Protocol / Internet Protocol

TCP/IP is a family of network and communication protocols for the transport and network layers. Also known as the Internet Protocol suite of network communication protocols.

Acknowledgements

The Eaton software development team is grateful to the following projects:

- Spider Monkey
- JSMiniNSPR
- Ext JS
- SQLite
  - The SQLite Project (http://www.sqlite.org/) generously donated source code to the public domain that helped us with this project.
- Open SSL
  - This Eaton IPP product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).
  - This Eaton IPP product includes cryptographic software written by Eric Young (eay@cryptsoft.com).
  - This Eaton IPP product includes software written by Tim Hudson (tjh@cryptsoft.com).
- Lib USB
- Net SNMP

The full license version for each of these projects is available from Eaton IPP using the **Settings > System > About** selection path.

Chapter 2   Installation

This chapter provides Eaton Intelligent Power Protector (IPP) installation prerequisites and quick start installation procedures. Information about uninstalling and upgrading the product is also included.

NOTE 1   Please refer to the following installation information Web page for operating system compatibility.

ⓘ

https://www.eaton.com/us/en-us/catalog/
backup-power-ups-surge-it-power-distribution/
eaton-intelligent-power-protector.resources.html

NOTE 2   The Eaton IPP Linux package is based on standard Linux mechanisms and therefore can be installed and used with other Linux distributions.

Installation Prerequisites

This section provides installation prerequisites for the following:

- Systems hosting the Eaton IPP
- Systems that display the Web-based graphical user interface (GUI)

ⓘ

NOTE   The Eaton IPP installs all the necessary drivers for USB communication. If the Windows operating system attempts to install a driver from "Windows Update," you can cancel this process.

On the System Hosting Eaton IPP

The Eaton IPP can be installed on Microsoft® Windows.

NOTE   All compatible Microsoft Windows versions are available in the *Eaton operating system compatibility list*.

ⓘ

https://www.eaton.com/content/dam/eaton/products/
backup-power-ups-surge-it-power-distribution/
power-management-software-connectivity/eaton-intelligent-power-manager/
software/release-notes/eaton-ipm-ipss-os-compatibility-list.pdf

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- To avoid network or serial port access conflicts, do not install the Eaton IPP on a machine that also hosts:
  - Eaton Intelligent Power Manager (IPM)
  - Eaton Enterprise Power Manager
  - Network Management Proxy
  - Eaton UPS Companion
  - LanSafe and LanSafe Web View
  - Netwatch

⚠ **IMPORTANT**

For Standby Configuration (Windows)
In the properties settings of the **Configuration Panel > Power Option**, you must deselect (uncheck) the Standby configuration of your operating system in order to be compliant with the Eaton IPP. With the standby configuration selected (checked), your system is not protected. If you want to save energy, enable the hibernate feature.

On the System that Displays the Web-based GUI

The Eaton IPP graphical interface can be accessed remotely using a simple Web browser. Access to this interface can be secured through Secure Socket Layer (SSL) connection and is also secured through login and password.

The Eaton IPP graphical interface has been tested with:

- Google® Chrome™
- Mozilla Firefox®
- Microsoft® Internet Explorer® (IE) version 7 and later

> ℹ️ **NOTE** For optimal performance, Google Chrome or Firefox is recommended. For good performance, IE version 9 and later is recommended. IE6 performance is not optimal.

Windows Quick Start Instructions

This section includes quick start installation and configuration instructions.

Graphical Installation

To install the Eaton IPP:

1. On a computer with a Windows operating system, run the Eaton Intelligent Power Protector package under an administrator account. The Eaton Intelligent Power Protector Installer Welcome screen displays.

2. Observe the prompt and verify that the communication device is connected. Click **Next** (see Figure 2). The Login screen displays.

Figure 2. Welcome Screen

3. Read the application description. Type the login and password and click **Login** (see Figure 3). The default entry for login and password is **admin**.
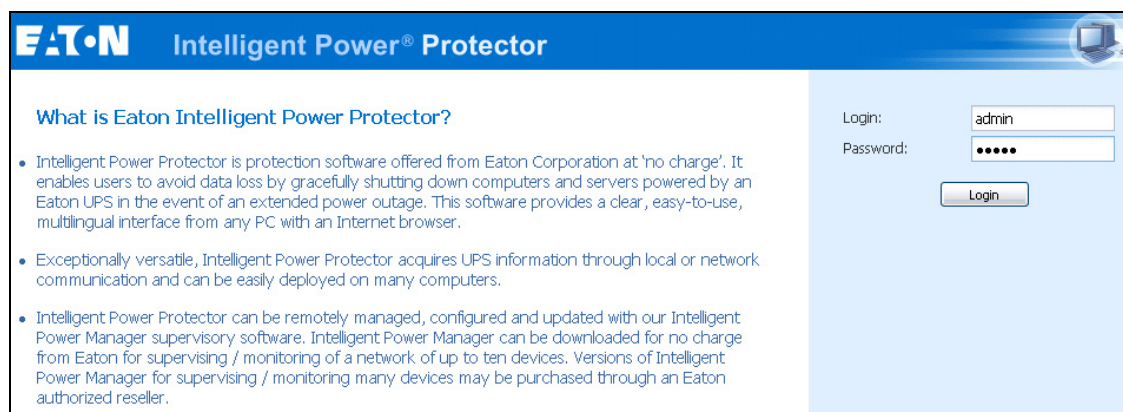
Figure 3. Login Screen

ⓘ NOTE If the browser does not open as planned, it should be started manually and pointed to http://127.0.0.1:4679.

Configuration

When started, the application automatically performs a discovery using the "Quick Scan" option:

Using the "Quick Scan" operation, you will discover

- **Serial line connected UPSs (RS-232 or USB)**. The discovered UPS (connected through RS-232 or USB ports) is automatically assigned as the Power source (the Status icon is Green ✅).
- **Networked UPSs through broadcast.** Quick Scan is compatible with Web/SNMP Cards, including Network-MS (example, 66102 / 103006826) and Modbus-MS (example, 66103), ConnectUPS-X-Slot, PXGX 2000, and PXGX UPS Card.

NOTE The discovered UPS connected through the Network are not automatically assigned as the Power source. You must select the node and click **Set as Power Source**. The icon becomes Green ✅.

Display the discovered nodes using **Settings > Auto Discovery** (see Figure 4). For the other nodes, perform the discovery based on IP address ranges using the "Range Scan" option. Using "Range Scan" discovers the nodes that are outside of the network segment and nodes that are not compatible with the "Quick Scan" feature. Refer to "Compatibility" on page 1 to determine if your node supports the "Quick Scan" feature.
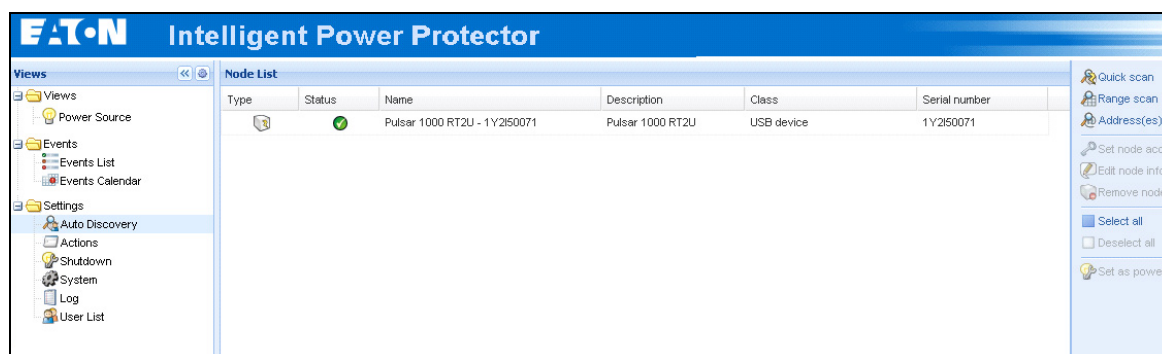
Figure 4. Quick Start - Auto Discovery Page

Operation

Use the **Views > Power Source** menu item (optional) to supervise the current state of the compatible power devices and applications. Select a line in the list and the panels are updated with selected device information (see Figure 5).

The **Events > Event List** view allows you to view the device events.
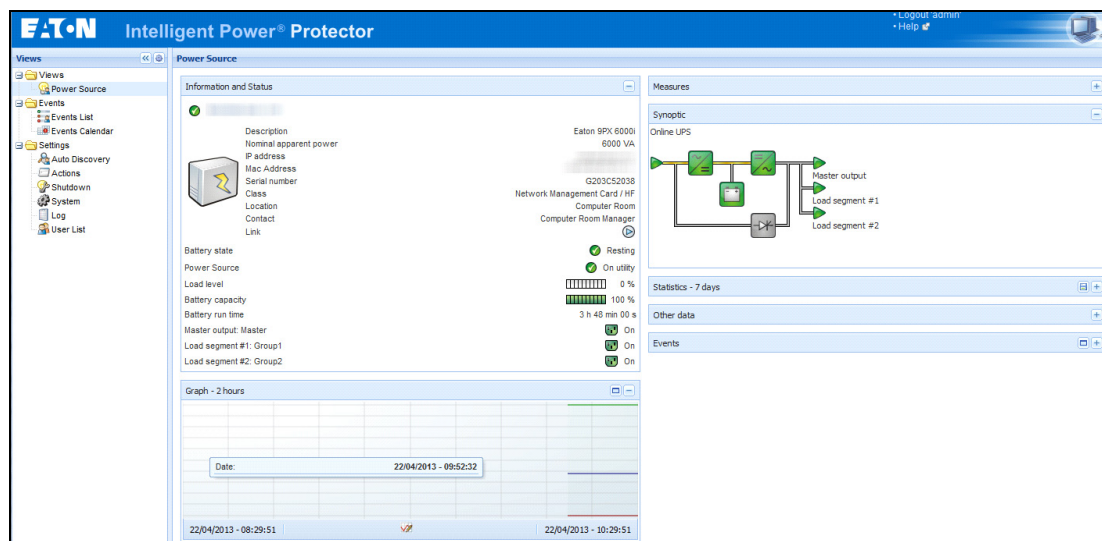
Figure 5. Power Source Main Page

Installation Result

⚠ **IMPORTANT**

If you install a new Eaton IPP release without uninstalling the old one, you will keep your database and your product settings.

- At the end of the installation, the following shortcuts are created in the group **Start > Programs > Eaton > Intelligent Power Protector**
  - **Open Eaton Intelligent Power Protector:** Starts the main Eaton IPP graphical interface
  - **Start Eaton Intelligent Power Protector:** Starts the service
  - **Stop Eaton Intelligent Power Protector:** Stops the service
  - **Uninstall Eaton Intelligent Power Protector:** Uninstalls the program

- A service called "Eaton Intelligent Power Protector" is also created for the Database Acquisition Engine.
  - This program continuously polls the status of Eaton devices and Applications connected on the network.
  - This service automatically starts on machine boot-up.
  - This service provides the Web Interface.

- A system tray icon displays the alarms on the local computer. Right-click this icon to display the same shortcuts as in the Windows Start menu.

Uninstalling the Windows Eaton IPP (Standard Method)

The following methods for uninstalling the Eaton IPP are available:

- Access the control panel selection for your operating system to uninstall programs and remove the **Eaton Intelligent Power Protector Vx.xx** package per your system instructions.

- You can also uninstall from the shortcuts to remove the product and custom files (if you confirm the action): **Start > Programs > Eaton > Intelligent Power Protector > Uninstall Intelligent Power Protector**

Installing/Uninstalling the Eaton IPP (Command Line)

You can install or uninstall the Eaton IPP product from a command line in order to deploy the software in a group, with or without using the graphical interface. You can also configure protection settings from the command line.

Detail of available command options can be obtained using the following command:

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

The available commands are:

- `-install`   Launches the installation/upgrade process (default).
- `-uninstall`   Launches the process to uninstall the application.

The available options are:

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

Access the installation folder:

```
-dir <installPath>
```

Power source settings can be provided with:

```
-sdn <login>:<password>@<address>,<loadSegment>,

<shutdownDuration>,<shutdownTimer>,<shutoffControl>
```

Example

The following command will install the Eaton IPP silently in C:\Program Files\MyFolder:
```
<packageName> -install -silent -dir "C:\Program Files\MyFolder" -sdn
admin:admin@192.168.100.101,1,120,-1,1
```

The Eaton IPP installs with shutdown feature parameters:

- Power source: 192.168.100.101
- Login: admin
- Password: admin
- Load segment: 1 (Master)
- Shutdown duration: 120 seconds
- Shutdown timer: -1 (None)
- Shutoff control: 1 (Enabled)

After the installation is complete, open a Web browser with the following URL:

`http://<host>:4679/` (where <host> is the host name or IP address of the machine hosting the Eaton IPP).

Linux Installation

Eaton IPP for Linux is available both in native package form (.rpm or .deb) and as a generic installer for Command Line Interface (CLI).

ⓘ

NOTE 1   Eaton IPP Linux packages can be installed on a VMware ESXi through a VMA.

NOTE 2   VMware ESXI 6.7 local protection, based on VMA, is not supported by IPP 1.61.

Native Installation on a Red Hat, Suse, Mandriva, or Derivative System

Graphical Installation

To install graphically:

1. Double-click the Eaton Intelligent Power Protector.rpm package.

2. The system prompts for the root password. Enter the root password. The system launches a graphical front end, such as Red Hat's package Installer (see Figure 6).

Figure 6. Red Hat Package Installer

Command Line Installation

To install from the command line:

1. At the command line prompt, type the command (as root):

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

For example:

```
$rpm -ivh ipp-linux-1.10.032-1.i386.rpm

Preparing...      ######################################### [100%]

   1:ipp-linux   ######################################### [100%]
```

2. When the installation is complete, open a Web browser with the following URL:

```
http://<@IP>:4679/
```
 (where <@IP> is the IP address of the machine hosting the Eaton IPP)

Native Installation on a Debian or Derivative System

⚠ **IMPORTANT**

On Debian (Lenny), there is no default graphical installer present. You should either use the following command line installation or install the package "gdeb" and "gdebi" and restart your graphical session to be able to complete this procedure.

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

Graphical Installation

To install graphically:

1. Double-click the Eaton Intelligent Power Protector.deb package.

2. The system prompts for the root password and then launches a graphical front end, such as Gdebi (see Figure 7):
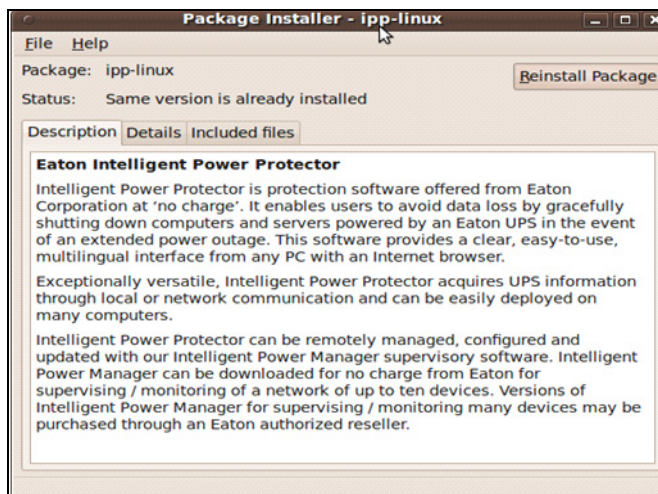
Figure 7. Gdebi Front End

3. Click **Install Package**.

4. After installation is complete, open the menu ***Application > Eaton> Eaton Intelligent Power Protector> Open*** (in Gnome), then follow the instructions in "Configuration" on page 17.

Command Line Installation

To install from the command line:

1.   At the command line prompt, type the command (as root):

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

For example:

```
$ dpkg -i ipp-linux_1.10.032-1_i386.deb

(Reading database ... 352242 files and directories currently installed.)

Preparing to replace ipp-linux 1.10.032 (using .../
ipp-linux_1.10.032-1_i386.deb)...

Unpacking replacement ipp-linux ...

Setting up ipp-linux (1.10.032)...
```

2.   When the installation is complete, open a Web browser with the following URL:

```
http://<@IP>:4679/
```
(where <@IP> is the IP address of the machine hosting the Eaton IPP)

Generic Installation on Linux

If your system does not derive from Red Hat (.rpm) or Debian (.deb), you can install Eaton IPP using the generic package. (This method is only supported from the command line.)

To install from the command line in interactive mode:

1.   At the command line prompt, type the command (as root):

```
$ ipp-linux-0x_0x_000x-i386 -install
```

2.   For silent installation, add the "silent" parameter (as root):

```
$ ipp-linux-0x_0x_000x-i386 -install -silent
```

3.   When the installation is complete, open a Web browser with the following URL:

```
http://<@IP>:4679/
```
(where <@IP> is the IP address of the machine hosting the Eaton IPP)

Uninstalling the IPP Linux Package

If you chose the native packages for installation, you can use your favorite packages management application to remove the "ipp-linux" package.

You can also do the same from the command line. For example:

- On RedHat and derivatives, use: `$ rpm -e ipp-linux`
- On Debian and derivatives, use: `$ dpkg -r ipp-linux`

> **ℹ NOTE** After uninstalling the native .rpm or .deb packages, some user's configuration and data are not removed, due to technical constraints.

- If you want to fully remove these, use the following command (as root):

`$ rm -rf /usr/local/Eaton/IntelligentPowerProtector`

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

`$ /installation/path/mc2 -uninstall`

- For silent uninstall, add the "silent" parameter (as root):

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

Upgrading the Eaton IPP Product

If you install a new Eaton IPP release without uninstalling the old release, you will keep your database and your product settings. Refer to the *Eaton Intelligent Power Manager (IPM) User's Guide* for upgrade information.

Chapter 3   Configuration

This chapter describes how to configure the Eaton Intelligent Power Protector (IPP).

Discover UPSs Connected through USB/Serial

To discover UPSs through a USB or Serial connection:

1. From the left-side **Views** panel of the Eaton IPP main interface window, select the **Settings-> Auto Discovery** menu item. The Node List page displays.

2. The first discovered UPS connected through RS-232 or USB is automatically assigned as the Power Source. Identify the Power Source by the green status symbol ✅ (see Figure 8).

When the Power Source is configured, the status symbol icon becomes green if the configuration is successful or gray if the communication fails.
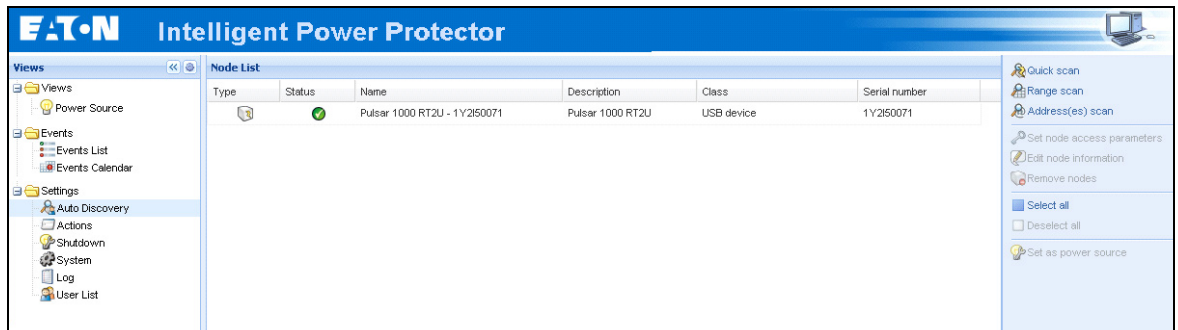
Figure 8. Eaton IPP UPS Auto Discovery

Discover Nodes Connected on the Network

Prerequisites

- Each network node (such as Web/SNMP cards), must have a valid IP address or a DNS name in the range that you have entered for auto-discovery. See "Compatibility" on page 1. The Eaton IPP automatically receives the alarms through notification or polling.

For ConnectUPS-X-Slot/BD, the following configuration settings are required:

- Set the IPP discovery password to the same value as the Web /SNMP read community name (default is public).

- In ConnectUPS Write Access Managers control menu (via Telnet, SSH, or serial connection), disable SNMP access restricted by IP/Hostname (default setting). In addition, Eaton IPP must be configured in trusted host list.

For PXGX 2000 and PXGX UPS cards, the following configuration settings are required:

- Set the IPP discovery password to the same value as the PXGX read community name (default is public).

- On the PXGX Access control page, disable SNMP access restricted by IP/Hostname or configure Eaton IPP correctly in the trusted host list.

- Take care to configure PXGX 2000 in SNMP V1 or SNMP V1 + V3.

Discovery

To discover nodes connected on the network:

1. From the left-side **Views** panel of the Eaton IPP main interface window, select the **Settings > Auto Discovery** menu item. The Node List page displays.

2. From the right-side panel, select a discovery method (see Figure 8):

   - **Quick Scan**: Automatically performed when application starts

   - **Range Scan**: Click the Range Scan button

   - **Address Scan**: Click the Address Scan button

Quick Scan

The Quick Scan request is a broadcast frame on 4679 IANA reserved port and 69 standard TFTP port. See "Compatibility" on page 1 to determine if your node supports Quick scan feature

Using the Quick Scan operation, you will discover within a few seconds:

- Web/SNMP Cards, such as Network Management Cards (NMCs), Network-MS, and Modbus-MS, ConnectUPS-X-Slot, Power Xpert Gateway 2000 (PXGX 2000), Power Xpert Gateway (PXGX UPS), and Gigabit Network Card (Network-M2)

	NOTE	Each network node (such as Web/SNMP cards), must have a valid IP address or a DNS name in the range that you have entered for auto-discovery. See "Compatibility" on page 1. The Eaton IPP automatically receives the alarms through notification or polling.

Range Scan

Using the Range Scan operation, you will discover the nodes that are outside of the Network segment and nodes that are not compatible with the Quick scan feature. See "Compatibility" on page 1 to determine if your node supports the Quick scan feature.

Clicking the **Range scan** button displays the Range scan dialog. In the Range scan dialog box, edit IP address ranges and eventually specify authentication parameters that are different from global scan settings (see Figure 9).
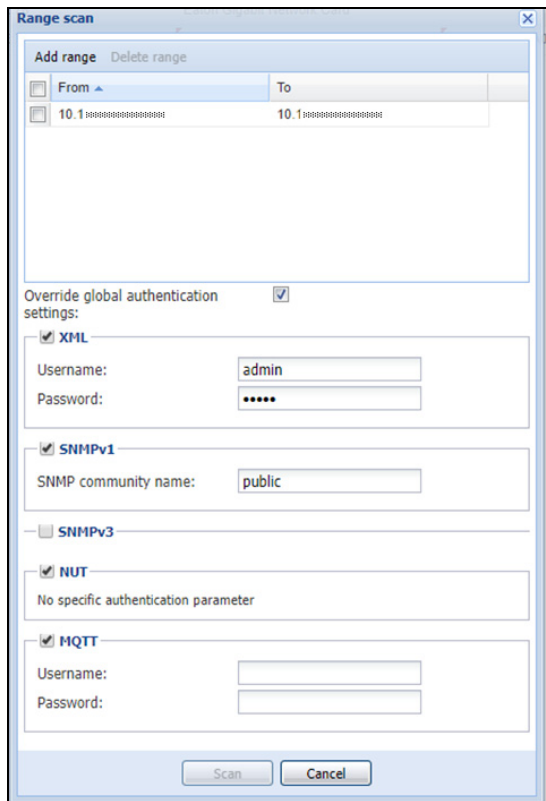
Figure 9. Range Scan Dialog Box

Address Scan

This type of node discovery performs a single address scan (or for several IP addresses separated by the ";" character). In the Address(es) Scan dialog box, edit IP addresses to scan and eventually specify authentication parameters that are different from global scan settings. Each node (network management card, proxy, or application) must have a valid IP address (or a DNS name) in the range that you have entered for auto-discovery (see Figure 10).

Figure 10. Address(es) Scan Dialog Box

Power Source

None of the discovered UPSs that are connected through (Network) are automatically assigned as the Power Source. You must select the node and click the **Set as Power Source** button. The Edit Shutdown Configuration dialog box opens automatically when the Power Source is set (see Figure 11).
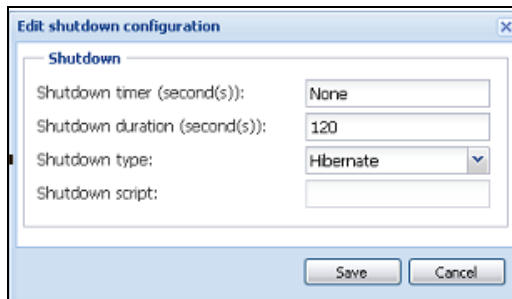
Figure 11. Edit Shutdown Configuration Dialog Box

Configure Node Settings

	NOTE 1	Eaton IPP automatically receives the alarms (through notification or polling) without specific configuration on the network card, proxies, or applications.
ⓘ	NOTE 2	Pairing Eaton IPP with the Eaton Gigabit Network Card (Network-M2) module must be done from the card. The detailed pairing procedure is available in the Network-M2 interface.

To configure node information and access parameters (administrators only):

1. From the left-side **Views** panel of the Eaton IPP main interface window, select the **Settings > Auto Discovery** menu item. The Nodes List page displays.

2. Select a node from the Nodes List page.

3. Click the **Edit node information** button or the **Set node access parameters** button.

4. The Edit Node Information dialog or the Access parameters dialog displays (see Figure 12 through Figure 14):

   • **Edit node information dialog.** The "Edit node information" dialog box allows editing the node name, the user type, the node description and the associated load alarm threshold.

   • **Access parameters dialog.** You can define the access settings for all selected devices. Only relevant settings are set, depending on the capabilities of the selected device capabilities.
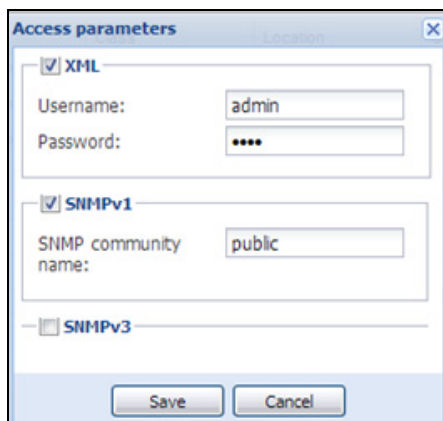
Figure 12. Node Access Parameters for NMC
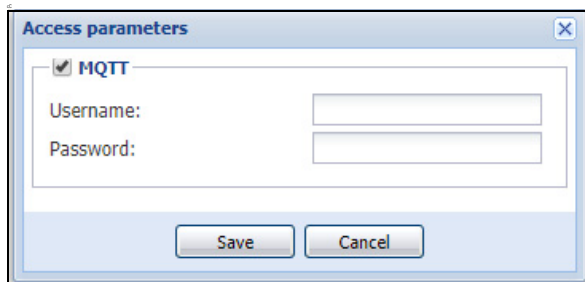
Figure 13. Node Access Parameters for Eaton Gigabit Network Card (Network-M2)
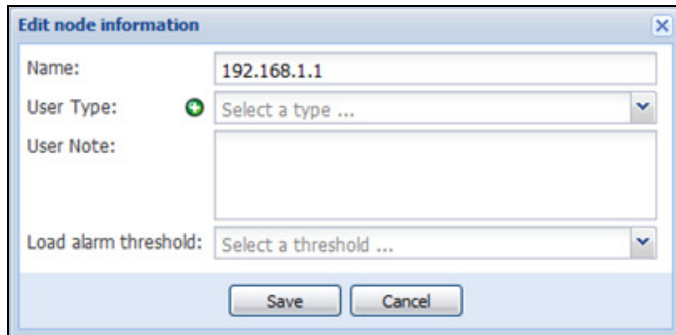
Figure 14. Node Information

Configure Actions

From the **_Settings > Actions_** menu item, the following types of notifications or executable actions can be set to occur as the result of specific Eaton IPP actions (see Figure 15 and Figure 16):

- E-mail
- Execute script/program
- Notification to the local alarm notification box, available from the System Tray icon
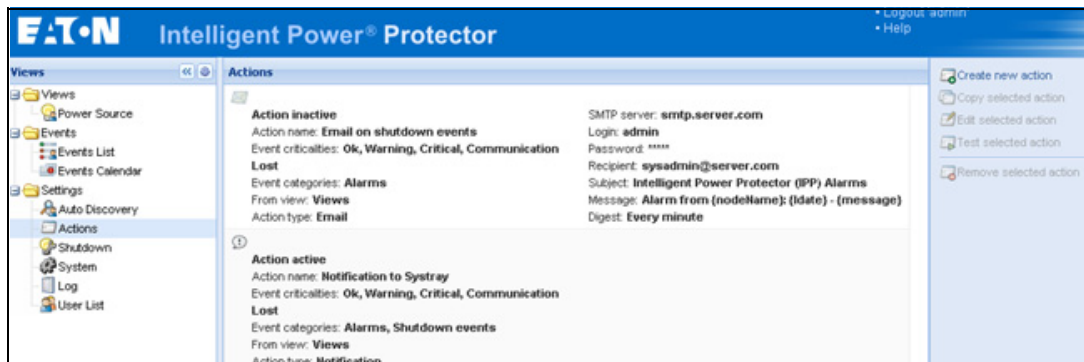
Figure 15. Actions Window
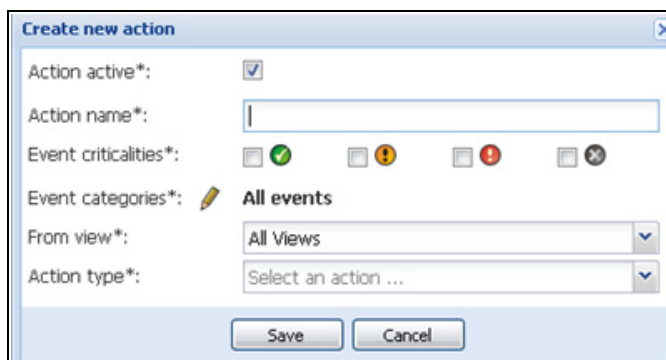
Figure 16. Create New Action Dialog Box

ℹ NOTE The "*" fields are required. Clicking the pen icon starts an assistant to fill the field.

- **Action active***: Enables/disables the action

- **Action name*:** Name for the action
- **Event criticalities***: Critical, Warning, Normal, Communication Lost. With this parameter, you can filter the notification according to the event level (see "Node Events List" on page 51). If you select "Critical" as filter you will not receive the associated "Normal" event informing that the device status changes from "Critical" to "Normal."
- **Event category***: All Events, Alarms, Shutdown events, Power events, Measures (see "Alarms and Events in Event Category List" on page 27). The pen icon allows you to select and edit the event category.
- **From View***: The view that triggers the event
- **Action type***: E-mail, Command, Notification. According to your choice, specific settings are available for each action.

E-mail Action Type

You can set e-mail notifications for specific events. First, set the event filter to specify the event trigger in the Create new actions dialog (see Figure 16). Then, set the e-mail notification criteria in the Edit Action dialog box (see Figure 17). The e-mail action is not active by default, but some of the fields in the e-mail action settings panel are preconfigured by default.

Figure 17. Edit Action Dialog

Specific e-mail action settings are as follows:

- **SMTP Server**: To receive e-mail on UPS events you have to indicate the SMTP server IP address. A valid login and password must be used when the SMTP server requests authentication.
- **Login, Password:** authentication information of the SMTP server
- **Recipient**: Receiver e-mail address. (You can specify multiple receivers by separating them with coma.)
- **Sender (Optional field)**: The e-mail sender. (Note that your SMTP server may require a valid e-mail address.)
- **Subject**: The e-mail subject (can be customized with pre-defined variables).

- **Message**: The e-mail message body (can be customized with pre-defined variables as shown in Figure 18).
- **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 e-mail. With this setting, you will receive more e-mail for the same number of events. Possible values are: None / Every 10 seconds / Every minutes / Every hour / Every day

For advanced use, the following options are available to you:

- You can duplicate an existing action already configured and modify the desired parameters.
- You can customize the subject, such as when you use a third-party service provider to translate e-mail into SMS.
- You can specify that you want to receive a consolidation of the alarms that occurred during a delay time duration. For example, if you specify none, each alarm generates an e-mail. With this setting, you will receive more e-mail for the same number of events.
- In the Edit message dialog (see Figure 18), click the green plus (+) button to add a variable.
- In the Edit message dialog, clicking the pen icon causes the Edit message assistant to fill the field with some variables.
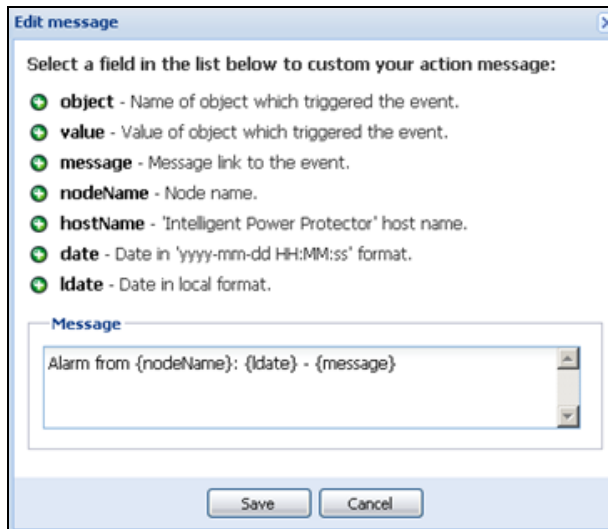
Figure 18. Edit Message Dialog

Command (Execute Script/Program) Action Type

In order to execute a script or program on UPS events, the program path is required.

Example to play sound alarms on events:

1. Create a batch command file containing the command:

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

2. Create an action of type command calling this batch file.

Windows

- For Windows, the program is executed under the SYSTEM account.
- For the right execution of some privileged commands, it is necessary to modify the execution context before it can be run.

- To allow a user to run specific tools and programs with permissions that are different from those assigned to the user's account, use the Windows "RunAs" command. This allows you to save the password (Windows XP Service Pac 2 and more recent versions).

- Use the following Microsoft command:

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

- When first executed, a password is required; it is saved for subsequent executions.

Linux

For Linux, the Eaton IPP process is running under root privilege (psuedo command is not needed to execute a program or shell script).

Alarm Box Notification Action Type

The Notification action is active by default. Notifications are provided by alarms by default. Up to 10 alarms are displayed on the local computer in an alarm box (see Figure 19). The status part of the alarm box is optional. It only appears if a power source has been declared in the Shutdown configuration settings.
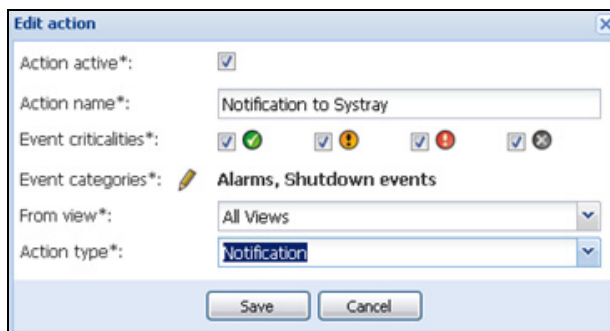
Figure 19. Alarm Notification Box with System

In the Event list, you can view more than 10 alarms (see Figure 20).
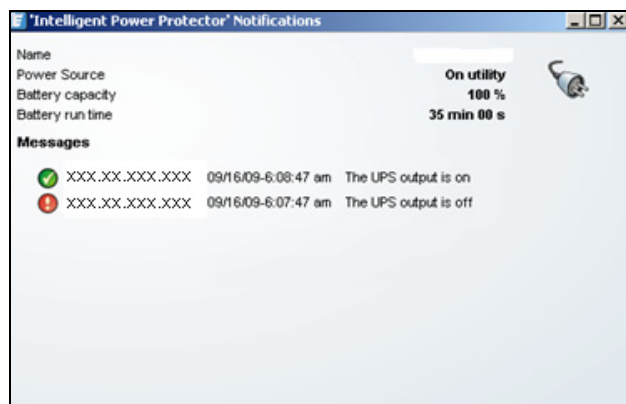
Figure 20. Alarm Notification Box with System Tray Icon

The Alarm notification box is accessible from the System Tray icon (see Table 4 and Table 5). Click the icon to open the window that displays the alarms on the local computer.

System Tray Icons

If no Power Source has been declared, the System Tray Icon can have the states described in Table 4.

Table 4. System Tray State Icons (Power Source not Declared)

Icon	State Description
	(BLUE) The System Tray Icon correctly receives alarms from Eaton IPP.
	(GRAY) Communication is lost between the System Tray and the Eaton IPP.

If a Power Source has been declared, the System Tray Icon can have the states described in Table 5.

Table 5. System Tray State Icons (Power Source Declared)

Icon	State Description
	The System Tray Icon correctly receives alarms from the Eaton IPP. AC is present on the power source.
	The System Tray Icon correctly receives alarms from the Eaton IPP. The power source runs in battery mode.
	The System Tray Icon correctly receives alarms from the Eaton IPP. A Warning event occurred on the power source.
	The System Tray Icon correctly receives alarms from the Eaton IPP. A critical event occurred on the power source.
	Communication with the power source has failed.

> **NOTE** Right-click the System Tray icon for fast access to the functions shown in Figure 21.

Open the notification box

Open the web interface
Start 'Intelligent Power Protector'
Stop 'Intelligent Power Protector'
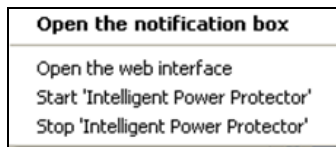
Figure 21. System Tray Contextual Menu

Alarms and Events in Event Category List

- **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

Advanced Events and Actions Customization

In the Eaton IPP 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 in this folder provides details about the expected structure and syntax for defining new actions and triggers.

```
UserScript =

{

  name: "MyScript",

  enabled: true, // Set this property to true to enable the script
```

Configure User Accounts

To configure multiple user accounts:

1. From the left-side **Views** panel of the Eaton IPP main interface window, select *Settings > User List.* The User List page displays (see Figure 22).

2. Click **Add user.** The Add user dialog box displays.

3. Type the user's login and the user's password (see Figure 23).

4. Select the user's profile level:
   - **Admin:** User will be able to access all the features
   - **User:** User will only access the visualization and cannot set changes to the system or nodes

5. Click **Save.**
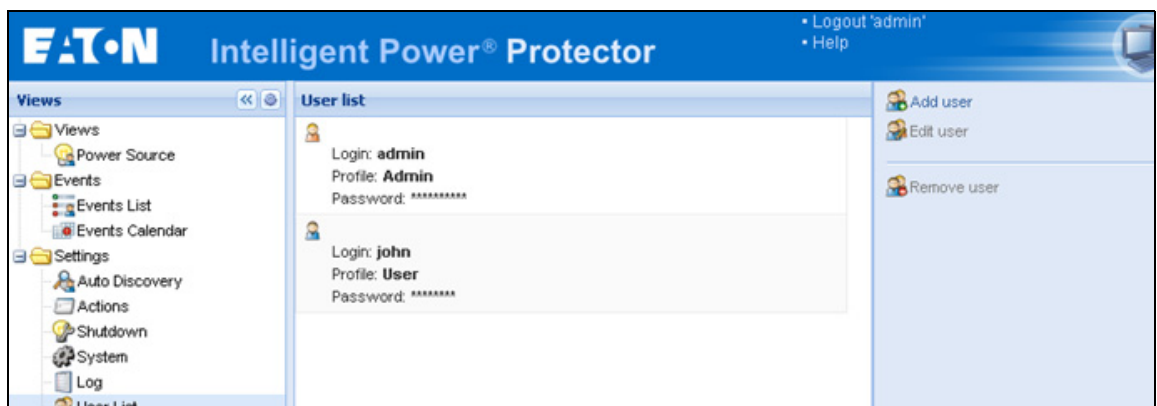
Figure 22. User List Page for User Account
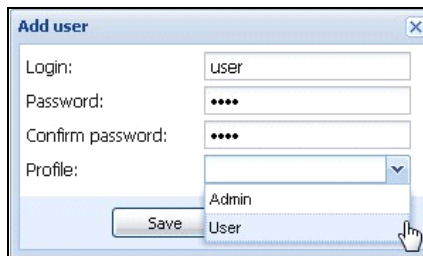
Figure 23. Add User Dialog Box

Note that the Eaton IPP contains a default Administrator profile with:

- "admin" as login
- "admin" as password

⚠ WARNING

For security reasons, Eaton recommends that you change the default password immediately after the installation. A pop-up message provides a security warning if the password contains less than eight characters.

System Settings

You can edit system settings. From the **Settings > System** menu item, you can edit system information, edit language, edit scan settings, and edit module settings (see Figure 24).
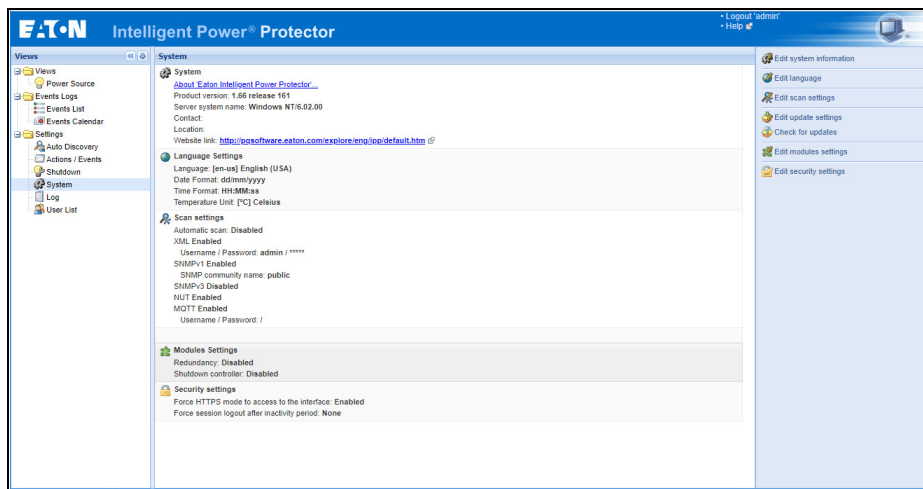
Figure 24. System Settings Page

Select one of the items on the System page and then double-click the item, or single-click the corresponding button in the right-side menu:

- **Edit system information** modifies contact and location information.
- **Edit language** allows you to change the interface language (Czech, English, French, German, Japanese, Korean, Polish, Portuguese, Russian, Simplified Chinese, Spanish, or Traditional Chinese).
- **Edit scan settings** are the default access settings that are automatically set for new discovered nodes.

- **Edit update settings** provide features that allow the system to automatically check for Eaton software updates for you. When a new software version is detected on www.eaton.com, a wizard displays and provides upgrade instructions for you. Eaton IPP will always be up-to-date if you select (check) the **Check automatically** option.

> **NOTE** Eaton IPP settings will be retained with this operation. Eaton IPM can manage updates with large number of computers. Refer to the *Eaton Intelligent Power Manager (IPM) User's Guide* for more information.

- **Check for updates** determines if a more recent version of the product is available on Eaton Web site.
- **Edit modules** allows you to enable/disable Eaton IPM optional modules:
  - **Shutdown controller** module enables shutdown of other Eaton IPPs connected to the UPS through this Eaton IPP. In that case, this Eaton IPP acts as an protection relay to other Eaton IPPs.
  - **Redundancy** module provides support for >1 UPS in N+1 redundant configurations.

Edit Scan Settings for Discovery

Administrators can set scanner authentication parameters that will be used as the default when discovering new devices manually or automatically. These authentication settings can be set for the XML, SNMPv1, SNMPv3 and NUT protocols.

Newly discovered devices will use these authentication parameters. Depending on the device-supported protocols, Eaton IPM will choose the needed parameters. See "Compatibility" on page 1 to determine which protocols are supported.

The administrator can also activate the automatic scanner to add any automatically discovered devices without a direct scan action of the administrator. For example, with automatic scan enabled, the presence of a new card on the network would be auto-discovered and added. The administrator can activate protocols used by scanner by selecting and deselecting (toggling) protocol check boxes. The administrator can also set default scanner authentication settings for each protocol.

> **NOTE** The XML access setting must be set to the main account (principal) in order to check the authenticity of the alarms source. If another user account is set, this will result in a communication lost when using the device as a power source.

To change scan settings:

1. From the left-side **Views** panel of the Eaton IPP main interface window, select the ***Settings > System > Scan settings*** menu item.
2. Click the Edit scan settings button on the right-side page. The Edit scan settings dialog box displays (see Figure 25).
3. Set the scan settings by selecting or deselecting (checking or unchecking) check boxes, typing data, or make selections from drop-down lists.
4. Click **Save**.

Figure 25. Edit Scan Settings Dialog Box

Chapter 4   Shutdown

The Eaton Intelligent Power Protector (IPP) provides local computer graceful shutdown when connected to a UPS through either a network card (Web/SNMP cards), USB port, or RS-232 port.

ℹ	**NOTE 1**	When the Shutdown feature is enabled, the software displays a communication error until the Power Source is correctly configured as described in "Edit Power Source".
	NOTE 2	Supervision is not possible until the power source has been set.

Shutdown Configuration

To access the shutdown configuration options:

1. Select the **Settings > Shutdown** menu item. The Shutdown page displays (see Figure 26).

2. The following configuration options are provided on the right-side panel of the Shutdown page:

   - Edit power source
   - Edit shutdown configuration
   - Edit advanced shutdown criteria
   - Edit UPS configuration
   - Test access
   - Test shutdown
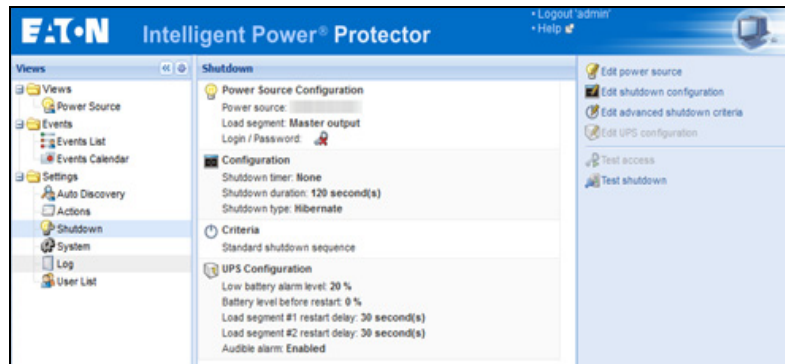
Figure 26. USB/Serial Power Source on Shutdown Page

Edit Power Source

This selection allow you to configure the power source. The dialog fields include:

- **Source**: The UPS that powers the computer hosting the Eaton IPP. This setting is also accessible through **Settings > Auto Discovery > Set as Power Source**.
- **Load segment**: The load segment that powers the server hosting IPP. When "Master" is selected, the UPS is completely switched off.
- **Login, Password**: A valid login and password is always **mandatory,** even if the power source is another Eaton IPP with the shutdown controller feature activated. Or, for example, if the power source is a Web/SNMP card, a valid login and password are needed to set values in the Web/SNMP Card, such as when changing the shutdown duration value.

ℹ️ **NOTE**   The login used must be the "admin" account.

To configure the power source, perform the following actions:

1. In the right-side panel next to the Shutdown page, click the **Edit Power Source** button. The Edit power source dialog opens.

2. In the Power source field, select the UPS that powers the computer hosting the Eaton IPP.

3. Select the UPS Load Segment that is powering the server.

4. Type the login and password.

5. Click **Save**.

Figure 27. Edit Power Source

⚠️ **IMPORTANT**

If the Shutdown feature is incorrectly configured, the software signals a communication error.
Check that power source and access parameters are set correctly.

Edit Shutdown Configuration

ℹ️ **NOTE 1**   The Eaton IPM or Eaton IPP can acquire shutdown alarms from another Eaton IPP that has the Shutdown Controller module enabled.

NOTE 2   The Edit shutdown configuration dialog opens automatically when the power source is set.

UPS Connected Through Network Card

To configure Shutdown Parameters (Network Device):

1. Login with an administrator user profile.

2. Select **Settings > Shutdown**. The Shutdown page is displayed.

3. Click **Edit shutdown configuration.** The Edit Shutdown Configuration dialog box displays (see Figure 28).

4. Change parameters as needed.

5. Click **Save**.
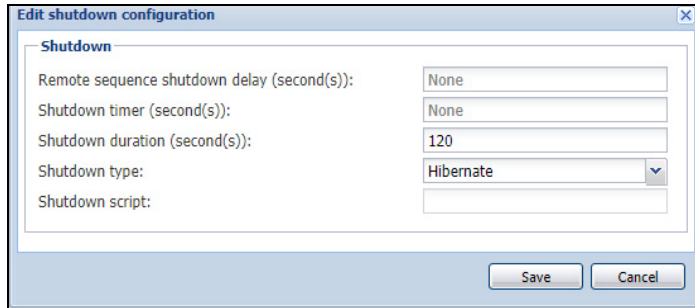
Figure 28. Edit Shutdown Configuration Dialog Box

The following parameters are available:

- **Remote Sequence Shutdown Delay:** Enter the sequence delay. This parameter can't be used in conjunction with the "Shutdown initiated after" parameter. This parameter is only available for the Eaton Gigabit Network card (Network-M2).

- **Shutdown Timer [Optional]:** This is the time period from mains power failure until the launch of the UPS shutdown sequence.

- **Shutdown Duration:** This is the time taken from the "Shutdown now" command to when the computer has completed the shutdown process.

- **Shutdown Type:** There are four shutdown type selections.

> ℹ️ **NOTE** If you select hibernate, but your computer does not have this function, the Eaton IPM will still protect the system by carrying out the normal (default) shutdown action.

- **Hibernate.** If Hibernate (default option) is available with your operating system, is better to use the hibernation feature (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 is automatically saved to the disk. The computer is also de-energized. When mains power returns, all the applications re-open exactly as they were and you return to the application 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 hibernate option is activated on the Hibernate tab sheet. If restart conditions are the same, then shut down and refer to the BIOS computer configuration. For Windows Vista, see "Troubleshooting" on page 4.

- **Shutdown.** This option shuts down your applications and the system, but does not de-energize the computer. The system offers the user the choice to de-energize the computer, in which case, it is the UPS that powers 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 wish to be on hand when the system restarts, or for load shedding.

- **Script.** This option manages the shutdown in a custom script that you can use to create your own shutdown sequence. You can integrate the standard Windows shutdown command. Find more information with shutdown /? in a Windows Command Line shell.

- **Shutdown script**: The absolute path of the script.

UPS Outlet Shutoff Active

This is an additional option that is available when the UPS is connected through a serial connection using USB or RS-232. This option is provided to stop the power source by the software.

Using this option, the Eaton IPP 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 the shutdown sequence. The UPS outlet is turned off at the end of the shutdown sequence.
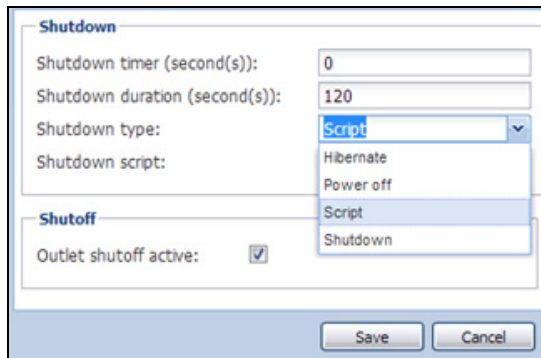
Figure 29. Edit Shutdown Configuration (Serial) Dialog Box

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 (see Figure 30):

- After the Shutdown timer (if configured) is reached.
- When the network management card or UPS shutdown criteria is reached. This decision is according to the criteria selected in the Edit Advanced Shutdown criteria dialog (see Figure 31).
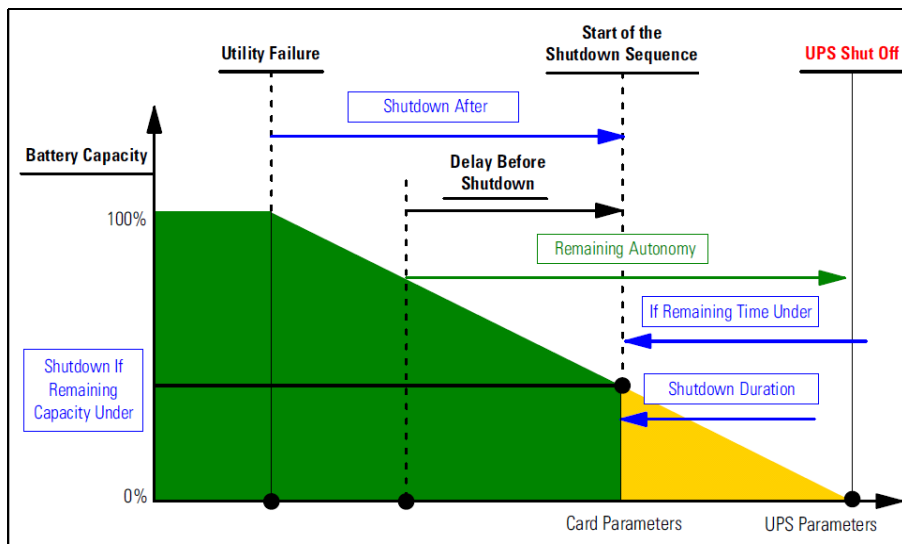
Figure 30. Shutdown Sequence

Edit Advanced Shutdown Criteria

This dialog establishes the criteria for shutting down a UPS.

By default, the "Shutdown criteria is reached" criteria enabled. This is the standard shutdown sequence taking into account "time based criteria" and "UPS low battery level criteria." In addition, the user can also select other events in the following events list.

If these events are selected, they will trigger an immediate shutdown sequence when they occur:

- Redundancy lost (For Eaton MX Frame only)
- Protection lost (For Eaton MX Frame only)
- UPS fault (internal fault or battery fault)
- UPS overload
- Output on bypass
- Communication failure

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

- Shutdown criteria is reached
- Redundancy lost
- Protection lost

To edit advanced shutdown criteria:

1. Login with an administrator user profile.
2. Select *Settings > Shutdown*. The Shutdown page is displayed.
3. Click **Edit advanced shutdown criteria.** The Edit Advanced Shutdown Criteria dialog box displays (see Figure 31).
4. Change parameters as needed.
5. Click **Save**.
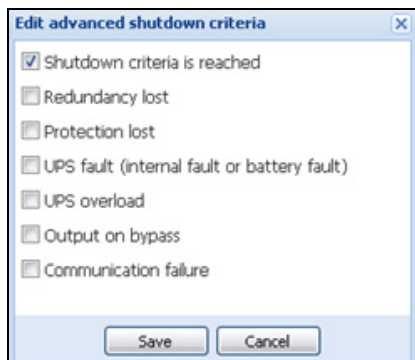
Figure 31. Edit Advanced Shutdown Criteria Dialog Box

Edit UPS Configuration

The Edit UPS Configuration dialog box is available for some UPSs connected through USB or serial. Otherwise, the parameters are displayed as "read only" through the network or if the UPS does not support this feature.

You can configure following UPS parameters:

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

To edit the UPS configuration:

1. Login with an administrator user profile.

2. Select *Settings > Shutdown*. The Shutdown page is displayed.

3. Click **Edit UPS configuration.** The Edit UPS Configuration dialog box displays (see Figure 32).

4. Change parameters as needed.

5. Click **Save.**

Figure 32. Edit UPS Configuration Dialog Box

Test Access

Test access checks if the login and password are correctly configured so that:

- Eaton IPP can update his shutdown configuration on the card
- Eaton IPP can remotely access to the Eaton IPP Shutdown Controller

Test Shutdown

Test shutdown starts a shutdown procedure according to the Eaton IPP parameters. This action will launch the entire shutdown sequence, including the UPS shutoff.

Shutdown Use Case

According to different architecture, we describe several typical use cases that will help you to configure properly the shutdown sequence according to your needs.

Architecture #1

This section provides shutdown use cases for a local, attached UPS through USB/Serial (see Figure 33).
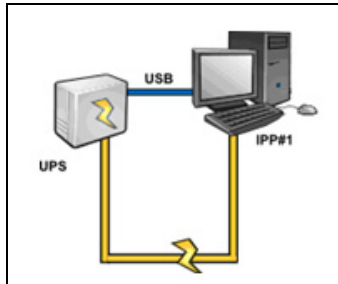
Figure 33. Architecture #1 Schema

Use Case 1

You want to keep your computer hosting Eaton IPP#1 alive as long as possible.

This is the default Eaton IPP#1 configuration. Figure 34 illustrates this Eaton IPP default configuration available from *Settings > Shutdown > Edit Shutdown Configuration*.
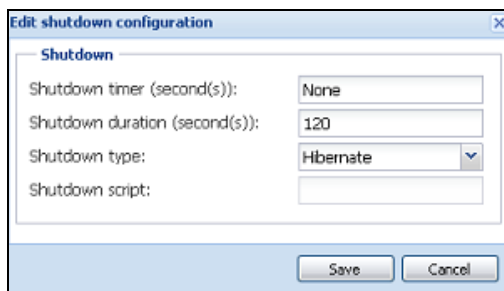
Figure 34. Edit Shutdown Configuration Dialog

Use Case 2

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

Configure a Shutdown timer value on Eaton IPP#1. This configuration parameter is available from *Settings > Shutdown > Edit Shutdown Configuration*.

Architecture #2

This section provides shutdown use cases for a network-attached UPS through Web SNMP Card (see Figure 35).
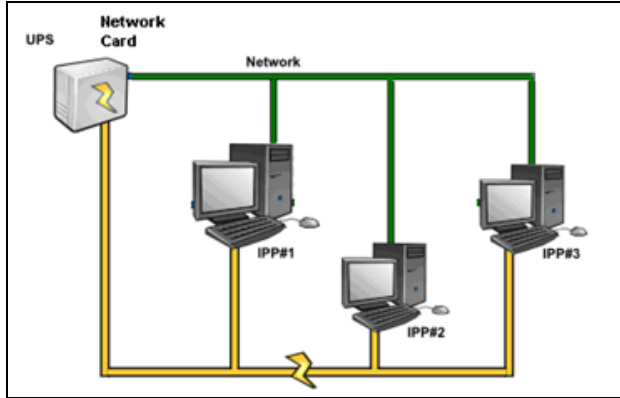
Figure 35. Architecture #2 Schema

Use Case 1

You want to keep all your computers alive as long as possible.

This is the default configuration for the Eaton IPP and the network management card.

The Eaton IPP default configuration is available from **Settings > Shutdown > Edit Shutdown Configuration**.

The network management card default shutdown configuration is available from **UPS > Shutdown Configuration**, as illustrated in Figure 36.

Figure 36. network management card Web Interface

Use Case 2

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

On the network management card, configure a Shutdown Criteria.

The network management card shutdown configurations are available from *UPS > Shutdown Configuration*.

In this case, the computer automatic restart is guaranteed.

Use Case 3

You want to perform load shedding on the specific computer hosting Eaton IPP#2. You want to stop the computer hosting Eaton IPP#2 after a predefined time.

On Eaton IPP#2, configure a Shutdown Timer value.

This configuration parameter is available from *Settings > Shutdown > Edit Shutdown Configuration*.

ⓘ	**NOTE 1**	In this case the automatic restart for the computer hosting Eaton IPP #2 is not guaranteed.
	NOTE 2	Use Case 3 can be combined with Use Case 1 or Use Case 2.

Architecture #3

This section provides shutdown use cases for a network-attached UPS through Shutdown controller (see Figure 37).
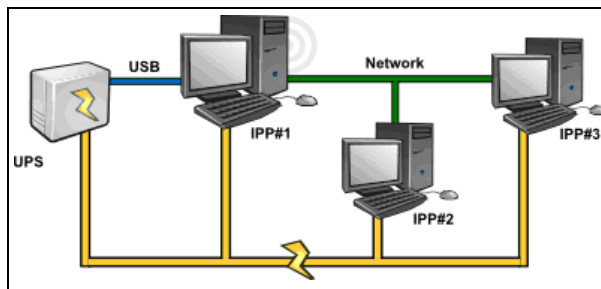
Figure 37. Shutdown Use Case - Architecture 3 Schema

Use Case 1

You want to keep all your computers alive as long as possible.

This is the default shutdown configuration for the Shutdown Controller Eaton IPP#1 and other Eaton IPPs.

The Eaton IPP default configuration is available from *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 Eaton IPP#1 (Shutdown Controller), configure a Shutdown Timer value.

This configuration parameter is available from *Settings > Shutdown > Edit Shutdown Configuration*.

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

Use Case 3

You want to perform load shedding on the specific computer hosting Eaton IPP#2 (stop the computer hosting Eaton IPP#2 after a predefined time).

On Eaton IPP#2, configure a Shutdown Timer value. This configuration parameter is available from **Settings > Shutdown > Edit Shutdown Configuration**.

🛈	**NOTE 1**	In this case the automatic restart for the computer hosting Eaton IPP #2 is not guaranteed.
	NOTE 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 servers' roles, you may want to shut down the servers at different times:

- **Computer hosting Eaton IPP#1** is directly attached to the UPS (USB/Serial). The Shutdown Controller must be installed on the server that will be the last one to shut down.
- On Pulsar series, this computer must be powered by the master outlet.
- **Computer hosting Eaton IPP#2** requires a long delay to shutdown, such as hosting database or VMware.
- **Computer hosting Eaton IPP#3** must be the last one to be shutdown because other servers depend on it, such as File server.
- **Computer hosting Eaton IPP#4** is another server that must be stopped before computer 2 or 3 (Web server), or this computer can also be stopped for load shedding purposes (workstation).

The recommended configurations are:

- On Eaton IPP#1: Configure Shutdown Timer to None and Shutdown Duration to 120s.
- On Eaton IPP#2: Configure Shutdown Timer to 180s and Shutdown Duration to 180s.
- On Eaton IPP#3: Configure Shutdown Timer to None and Shutdown Duration to 120s.
- On Eaton IPP#4: Configure Shutdown Timer to 120s and Shutdown Duration to 120s.

The following time diagram summarizes this configuration (see Figure 38).
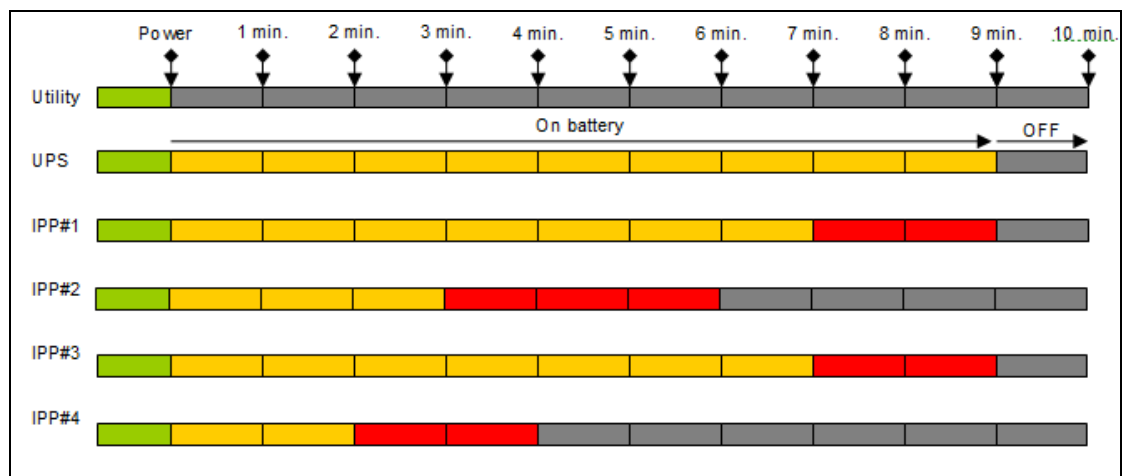
Figure 38. Shutdown Controller Diagram

Chapter 5 Supervision

This chapter describes supervision features in the Eaton Intelligent Power Protector (IPP).

> **ⓘ NOTE**   Supervision is not possible until the power source has been set.

Access to the Monitoring Interface

You can access the interface locally or remotely.

Local Access

From the system where Eaton IPP is installed, you can use the following shortcut:

Start > Programs File > Eaton > Intelligent Power Protector > Open Eaton Intelligent Power Protector

1. From a local computer, you can type either of the following URLs in a Web browser:

    https://127.0.0.1:4680/

    -or-

2. http://127.0.0.1:4679/

Remote Access

1. From a remote computer, you can type either of the following URLs in a Web browser:

    https://<name or IP address of computer hosting Eaton IPP>:4680/
    -or-

    http://<name or IP address of computer hosting Eaton IPP >:4679/

2. In SSL mode, accept the certificate using the procedure provided by your Browser.

3. Enter the login and password.

Power Source View

The Power Source view allows you to supervise the information from the UPS that powers the Eaton IPP computer.

To open the Power Source view:

1. Start the Eaton Intelligent Power Protector main graphical interface from the previously created shortcut.

2. Click the ***Views > Power Source*** menu item. The Power Source window displays (see Figure 39):

This window has a flexible panels option. You can select which panels to display and you can drag-and-drop the panels within the window to customize the location of each panel.
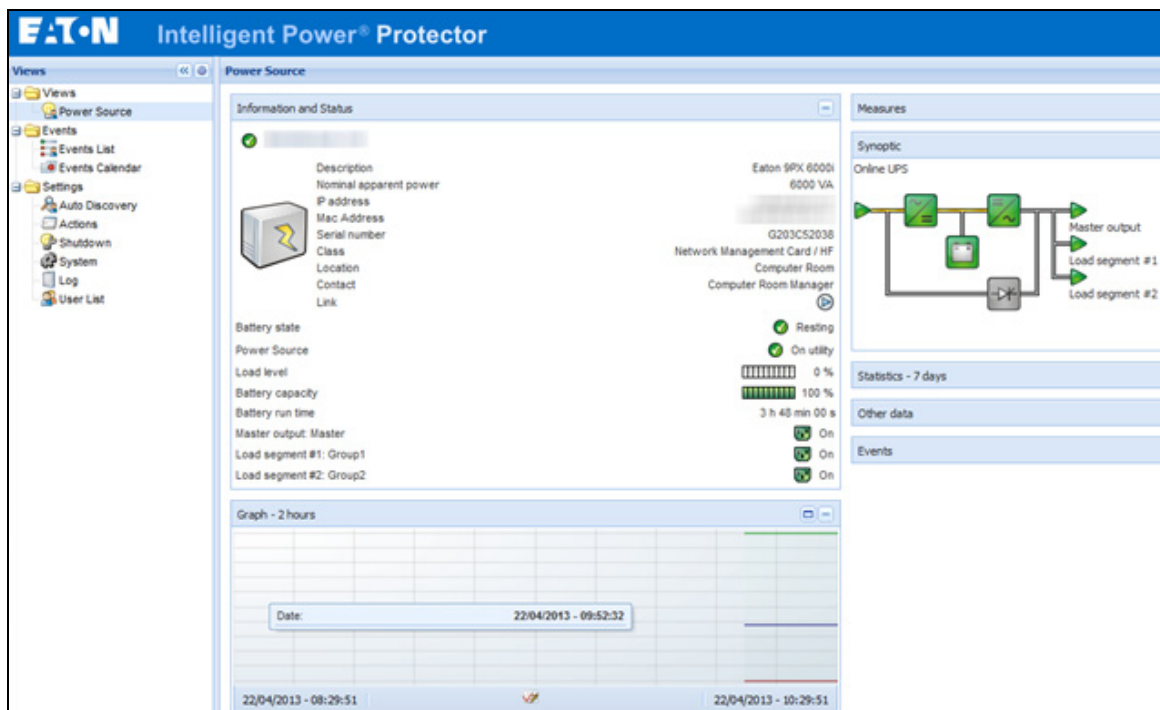
Figure 39. Power Source View

Information Panel

The following node information displays in this panel (see Figure 40):

- **xxx.xxx.xxx.xxx:** DNS name (or IP address) displayed near the "status icon"
- **Description:** Commercial product name
- **Nominal Apparent Power:** Device load capacity in VA
- **IP address:** Device IP address
- **Mac address:** Device MAC address
- **Location:** Device location (value of syslocation object can also be configured on the Device page)
- **Contact:** Device contact (value of syscontact object can also be configured on the Device page)
- **Serial Number:** Device serial number (if available)
- **Link:** Link to device Web site (if available)
- **Battery State**: Charging / Discharging / Default / Floating / Resting
- **Power Source**: AC Power / Battery
- **Load Level**: The output load level of the device
- **Battery Capacity**: Battery capacity of the device
- **Battery Run Time**: Remaining back-up time for the device
- **Master Output**: Main output status (ON/OFF/Internal Failure/On Automatic Bypass/Manual By Pass/ Overload)
- **Group #x**: Output outlet status (ON/OFF)

> **ℹ** **NOTE** The information displayed in this panel depends on capabilities of the UPS you are viewing.
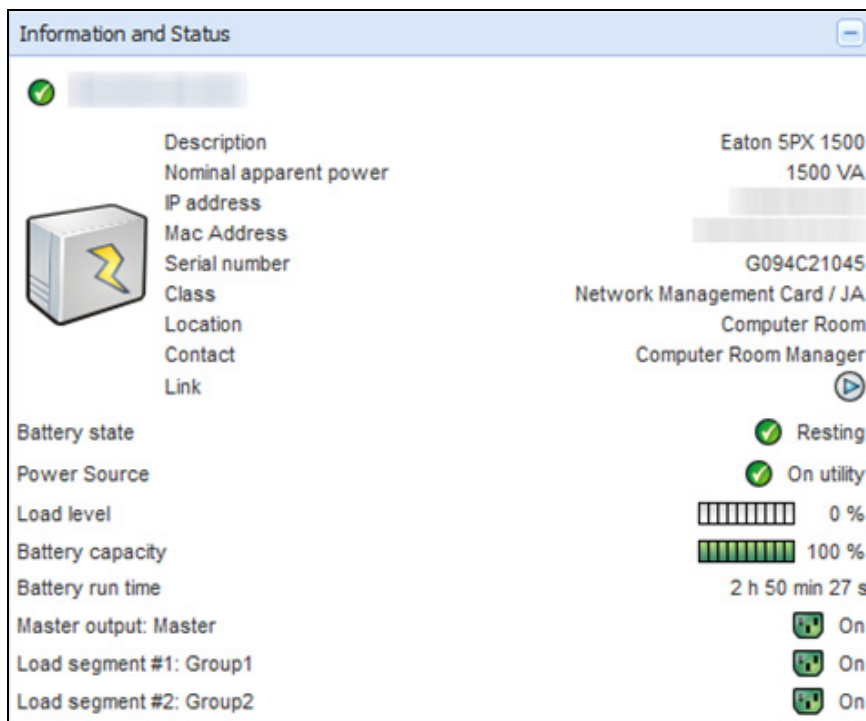
Figure 40. Information Panel

Measures Panel

This panel displays the selected device electrical parameters for single-phase or three-phase devices, depending on the node capabilities (see Figure 41 and Figure 42).
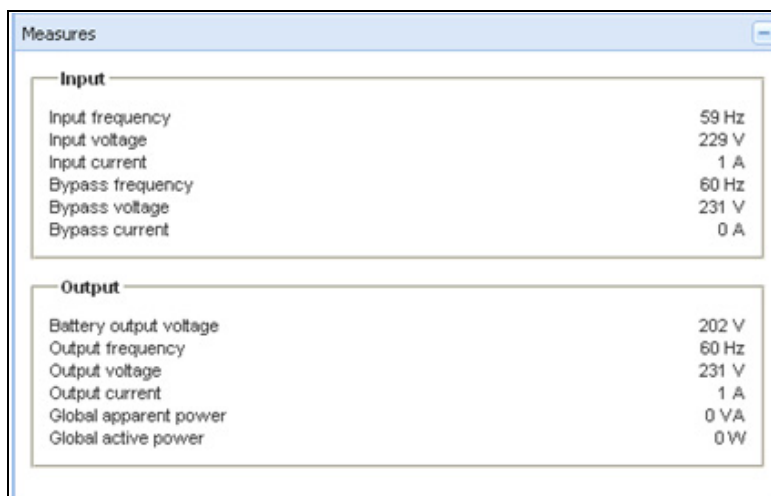
Figure 41. Measures Panel (Single-Phase)

Figure 42. Measures Panel (Three-Phase)

Environment Panel

This panel displays the selected device sensor information (see Figure 43):

- **Temperature:** Sensor-obtained temperature (in °C or °F). The temperature unit can be configured from the System configuration language settings.
- **Humidity:** Humidity level
- **Input #1:** Status of first contact (open / closed)
- **Input #2:** Status of second contact (open / closed)

ⓘ   **NOTE**   For more information about the two optional input connections, please refer to the *Eaton Environmental Monitoring Probe (EMP) User Guide.*

Figure 43. Environment Panel

Graph Panel

This panel displays the graph of the main measures of the selected device. To read the values, place your mouse cursor over the graph. A vertical line appears over it and you can read the values in the box for the selected date (see Figure 44):

- The 🔲 button allows you to zoom in the graph.
- The 🔡 button allows you to select the data you want to display in the graph.

Figure 44. Graph Panel

In the Graph settings dialog, you can select up to six measures to display simultaneously (see). Time scale possible values are: 1 hour / 2 hours / 6 hours / 12 hours / 24 hours / 2 days / 1 week
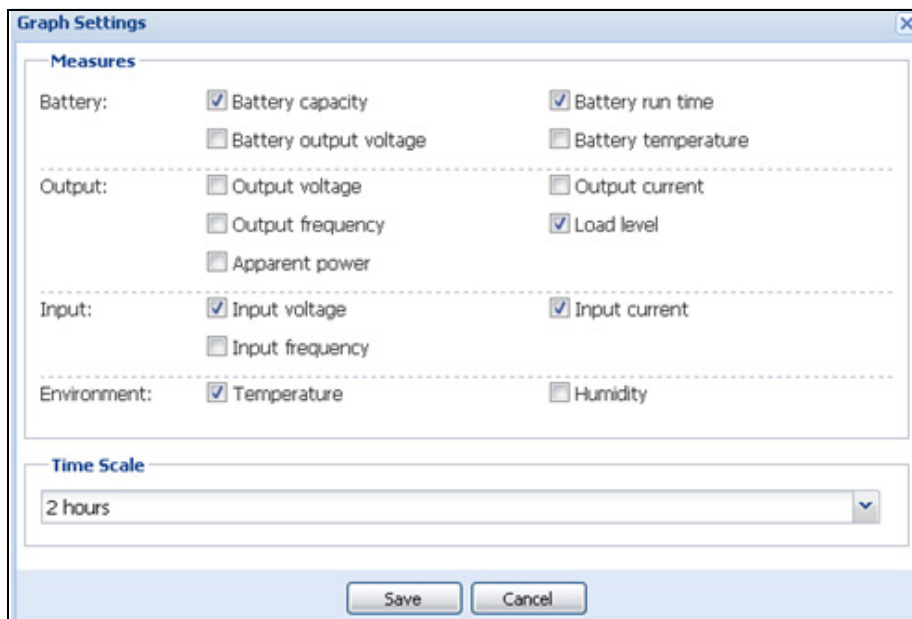
Figure 45. Graph Settings Dialog

Synoptic Panel

This panel displays the selected device synoptic (see Figure 46). A tool tip displays when you move the mouse over one of the functional block.
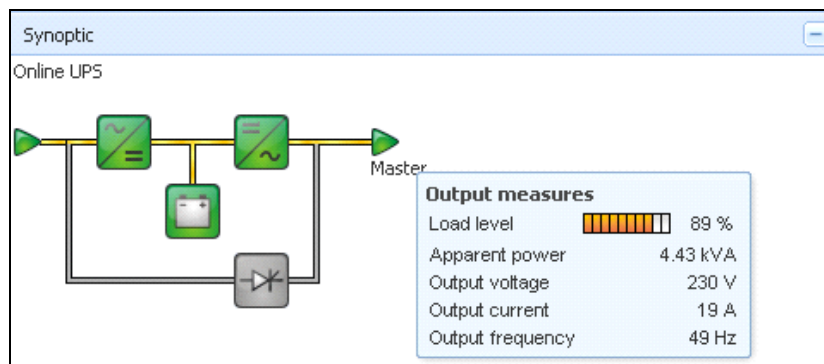
Figure 46. Synoptic Panel

The Synoptic color coded icons display for the following (see Table 6):

- UPS modules
- Battery modules
- Electrical flows
- Electrical power sources at UPS input
- Load at UPS output, with status linked to UPS output status
- Combined flow status and load status

Table 6. Synoptic Panel Icons

Symbol	Color	Description
UPS Modules		
AC/DC DC/AC Bypass	Green	Status OK and Active
AC/DC DC/AC Bypass	Red	Internal Fault and Inactive
AC/DC DC/AC Bypass	Gray	Status OK and Inactive or Unknown
Battery Modules		
	Green	Status OK
	Orange	Battery charge is less than 50%

Table 6. Synoptic Panel Icons (Continued)
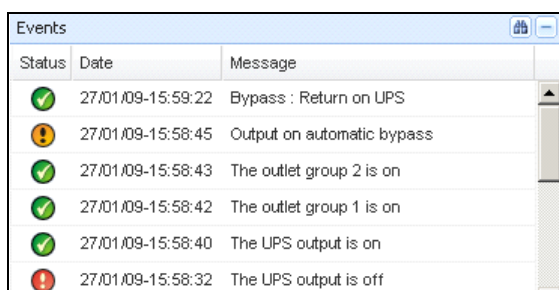
Symbol	Color	Description
	Red	Battery fault or End-of-backup
	Gray	Battery status unknown
Electrical Flows		
	Yellow	Current flow through the cable **NOTE** The object animation gives the direction of the current flow.
	Gray	No current flow through the cable

⚠ WARNING

Although there is no current flow through the cable, the cable may be under voltage.

Symbol	Color	Description
Electrical Power Source at UPS Input		
	Green	Source powered. Status OK
	Gray	Source not powered or status unknown
Load at UPS Output		
	Green	Load powered and protected. Status OK
	Red	Load not powered
	Gray	Load status not known
Combined Color Code: Flow and Power Source Status		
	Green/Yellow	Electrical power source is powered and provides electrical flow
	Green/Gray	Electrical power source is powered and does not provide electrical flow

Table 6. Synoptic Panel Icons (Continued)

Symbol	Color	Description
Combined Color Code: Flow and Load Status		
➡	Yellow/Green	Load powered and protected
➡	Gray/Red	Load not powered

Events Panel

This panel displays the events list of the selected node (see Figure 47). You can sort the events according to status, date, and message by clicking the column header.

Figure 47. Events Panel

Statistics Panel

This panel displays the statistics of the selected node (see Figure 48). The [icon] button allows you to select the time interval for the statistics. You can adjust the time interval by clicking the two buttons with the "From" and "To" dates.

The statistics computed data is as follows:

- Active Consumption in Watts
- Average Active Power in Watts
- 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**   This information depends on device capabilities.

Figure 48. Statistics Pane

Events

List Representation

Select *Events > Events List* to display the Events List page (see Figure 49). All new alarms are stored in this log. You can sort the alarms according to the Status, Date, Name, and Acknowledge (ACK) fields.

Figure 49. Events List Page

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 event.

	NOTE	When an alarm is acknowledged, it is marked with a check box but it is still viewable in this Event list. It decreases the number of non-acknowledged alarms. The acknowledged alarms disappear in the **Power Source > Event** dedicated portal panel.

- **Show/Hide acknowledged events**: Displays or hides all acknowledged events.
- **Export Logs**: Creates a logs.csv file with the following syntax:

  ```
  "Date","Node","Type","Level","Object","Value","Message",
  ```

	NOTE	The export command may take several seconds before allowing the download in order to create the logs file.

- **Purge Logs**: Delete all logs (specify a date).
- **Select all**: Selects all displayed events.
- **Deselect all**: Deselects all selected events.

	NOTE	You can select one alarm by clicking it. You can also select several alarms using a Shift-Click or Alt-click keystroke techniques. When selected, the alarm row is dark blue.

Calendar Representation

Select **Events > Events Calendar** to display the Events Calendar page. In this matrix representation, each line is a week and each column is a day in the week. If you select a day or an interval (with the date-picker or using the Shift + Click keystroke technique), the Events and Statistics panels provide all information for this selection and automatically refresh when new statistics are computed (see Figure 50).
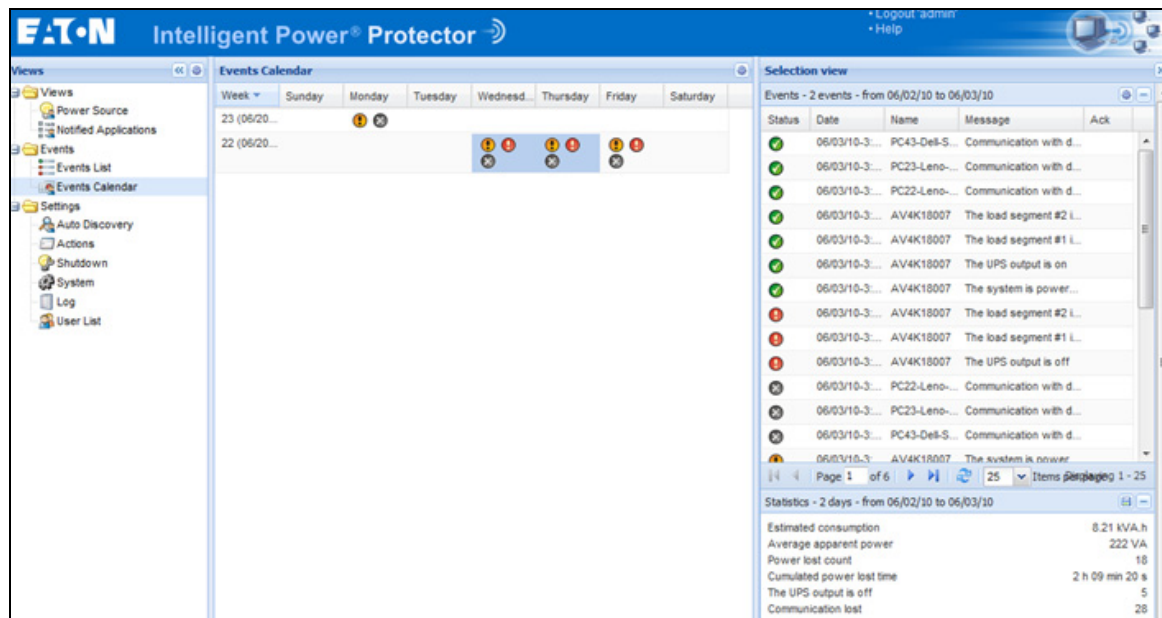

Figure 50. Event Calendar Page

Node Events List

The icons in the different views represent the event severity.

🟢 **NORMAL** With this event, the UPS device is returning to a normal status.

Normal Event list (UPSs, Generic Devices):

- 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 UPS device. Your application is still protected.

Warning Event List (UPSs, Generic devices):

- 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)

🔴 **CRITICAL** A serious problem occurred on the UPS device. This problem requires an urgent action. Your application might NOT BE powered.

Critical Event List (UPSs, Generic devices):

- 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** Communication is lost.

Communication Lost Event List:

• Communication failure with Device or Application

Launching the Device Web Interface

From the Status panel, you can access the Web page for Eaton cards, including an on-board Web server. Click the associated Web link for http access (blue icon ▶) or for the https access (yellow icon ▶).

Figure 51 provides examples of the opening view from different Web interfaces.

Figure 51. Opening View in Different Interfaces

Chapter 6   Redundancy

This chapter describes the Eaton Intelligent Power Protector (IPP) redundancy features.

The Eaton IPP can supervise composite devices. Composite devices are virtual nodes composed of two or more UPSs mounted with specific redundancy topologies and a dedicated redundancy level.

	NOTE	Specific redundance topologies include Redundant supplies, Hot standby, Static transfer switch (STS) for two components, and Parallel for two or more components.

Enabling Redundancy

The Redundancy feature is enabled from ***Settings > System > Modules Settings*** (see Figure 52). After the feature is enabled, the Eaton IPP performs the following:

• Supervise composite devices

• Shut down the Eaton IPP computer when a composite device is set as the power source.
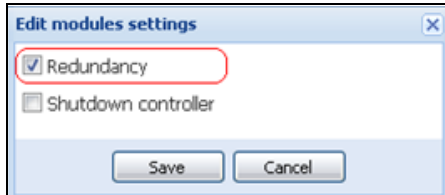
Figure 52. Edit Modules Settings Dialog Box

Electrical Redundancy Schemas

Figure 53 to Figure 56 illustrate the electrical redundancy topologies.

• **Redundant supplies (such as dual feeds or triple feeds):** Figure 53 illustrates a scenario when two UPSs provide power on one or several multiple-feed servers.
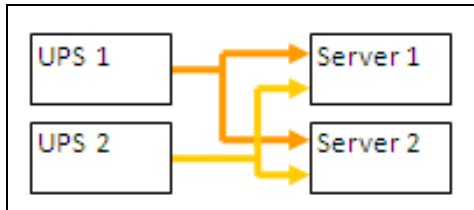
Figure 53. Redundant Supplies

• **Hot standby mode:** When the upstream UPS powers the load, the downstream UPS is on bypass.
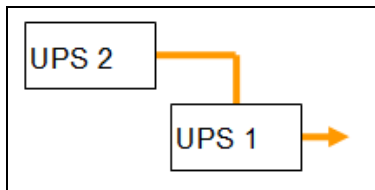
Figure 54. Hot Standby

- **Static transfer switch for two components:** For STS mode, there are several cases with single STS or multiple STSs.
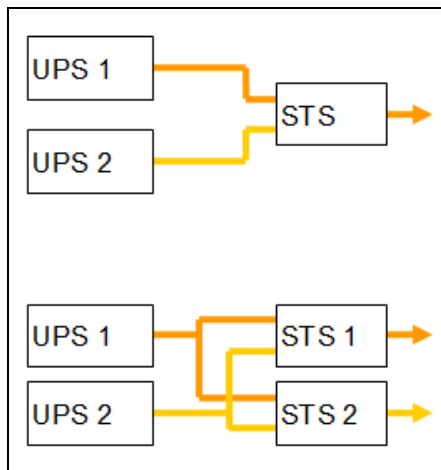
Figure 55. Static Transfer Switch

- **Parallel for two or more components:** All the UPSs power the load at the same time.
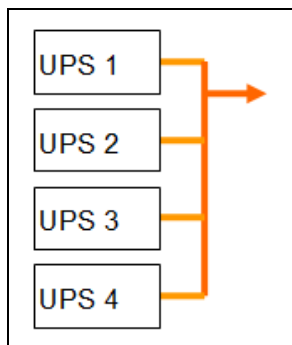
Figure 56. Parallel Redundancy Schema

Configuring Redundancy

To configure redundancy:

1. From the left-side **Views** panel of the Eaton IPP main interface window, select the **Settings > Auto Discovery** menu item. The Node List page displays.

2. From the Node List page, select two or more nodes.

3. Click **Set composite device** in the right panel (see Figure 57).
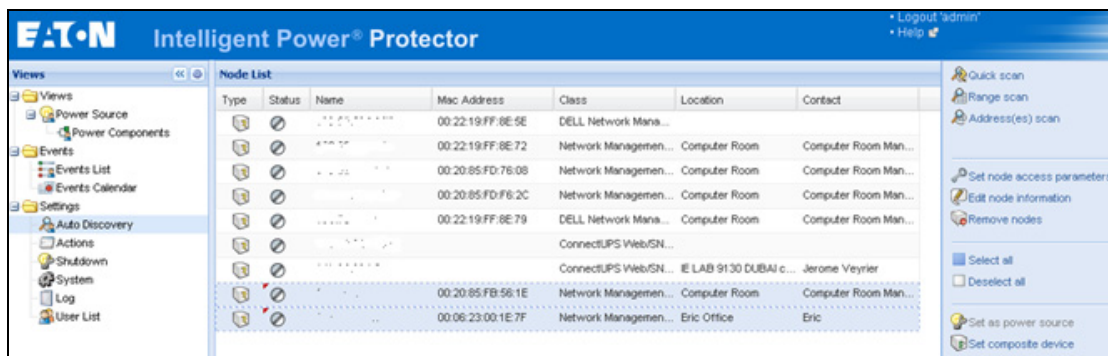
Figure 57. Selecting Set Composite Device for Nodes

4. In the dialog box, specify a device name, redundancy mode, and level (see Figure 58):

- **Device Name**: Name of the composite device

- **Redundancy Mode**: Parallel, Redundant Supplies, Hot Standby or Static Transfer Switch

- **Redundancy Leve**l: Minimal number of redundant UPSs powering your system; default value is 0.

> **ⓘ** **NOTE** If you set this parameter to a higher level, you will receive the "Redundancy Lost" alarm.
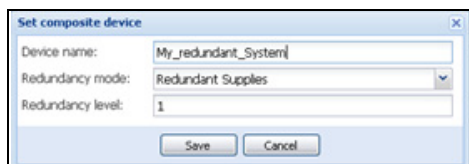
Figure 58. Set Composite Device Dialog Box

When the new node is created, it displays in the Node list.

Actions you can perform on the new node are as follows (see Figure 57):

- You can select it as power source (**Set as power source**).
- You can edit composite device properties (**Set composite device**).

> **ⓘ** **NOTE** If you select components of a composite device and click **Set composite device** again, properties of existing composite devices are shown; no new composite device is created so no composite device duplication is possible

To select the new node as the power source:

1. Select the new node in the discovery view.

2. Click the **Set as power source** button in the right panel.

To edit composite device properties:

1. Select the new node in the discovery view

2. Click the **Set composite device** button in the right panel. Edit the properties.

To retrieve properties of an existing composite device:

1. Select components of a composite device.

2. Click **Set composite device** in the right panel. Review the properties of the existing composite device.

ℹ **NOTE**   No new composite device is created by this action, so no composite device duplication is possible.

Redundancy Views

Composite Device in Power Source View

When the redundancy module is activated, a composite device can be selected as power source. From the **Views > Power Source** menu selection, the Power Source page displays. Four panels display with specific data for the device, including Information, Status, Events, and Power Components (see Figure 59).
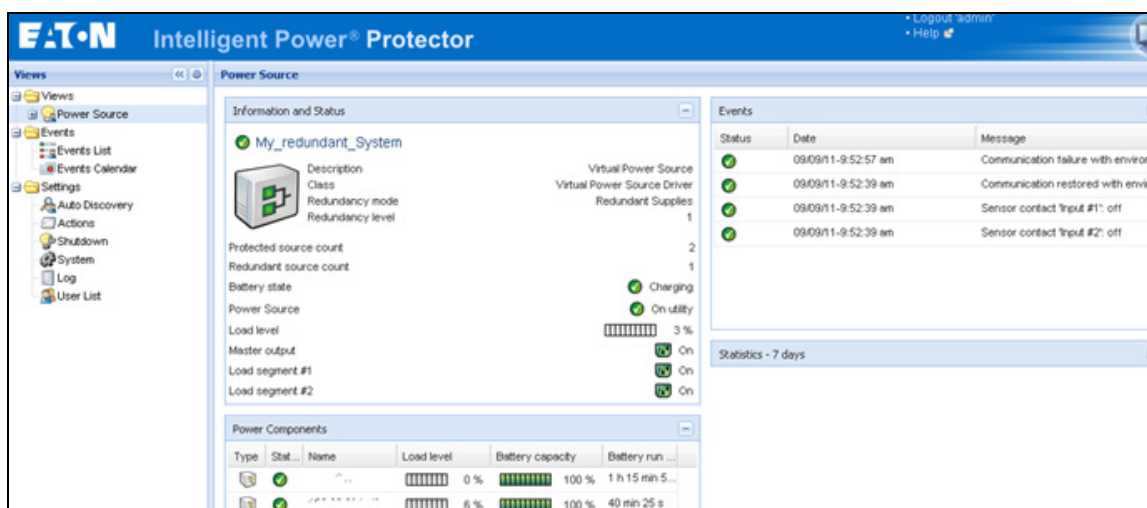
Figure 59. Composite Device Power Source View

Power Components Sub-view

When the redundancy module is activated, a sub-view of the Power Source view is available. From the **Views > Power Source > Power Components** menu selection, the Power Components display in the Node List. The Selection view display properties of the power components selected in the Node List (see Figure 60).

ℹ **NOTE**   This view shows only components of the selected power source if it is a composite device.
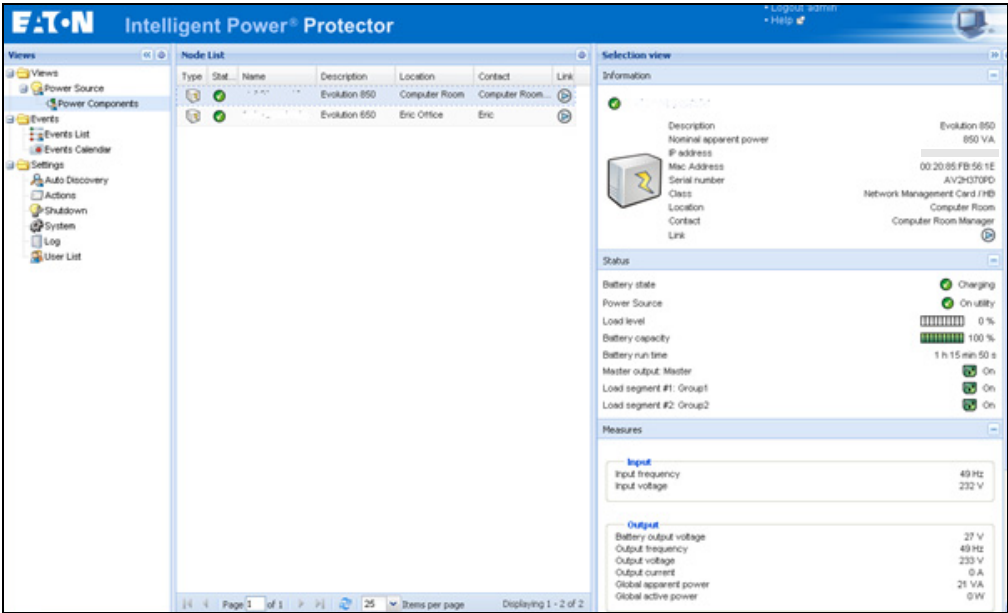
Figure 60. Power Components Sub-view

Redundancy Use Cases

This section describes several typical use cases to help you properly configure the redundant shutdown sequence according to your needs.

Use Case #1

You want to have the longest backup time with the redundant configuration. To do so, use the default IPP configuration.

- The IPP default configuration is available from **Settings > Shutdown > Edit Shutdown Configuration** (see Figure 61).

- For Network-MS (example, 66102/103006826) and Modbus-MS (example, 66103), the default configuration for the network management card shutdown configuration is available from **UPS > Shutdown Configuration** (see Figure 62).

- For ConnectUPS-X-Slot or ConnectUPS-BD network cards, the network management card default shutdown configuration is available from **Configuration > UPS Shutdown and Restart Settings** (see Figure 63).
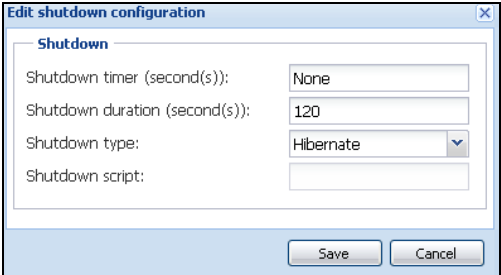
Figure 61. Edit Shutdown Configuration Dialog Box
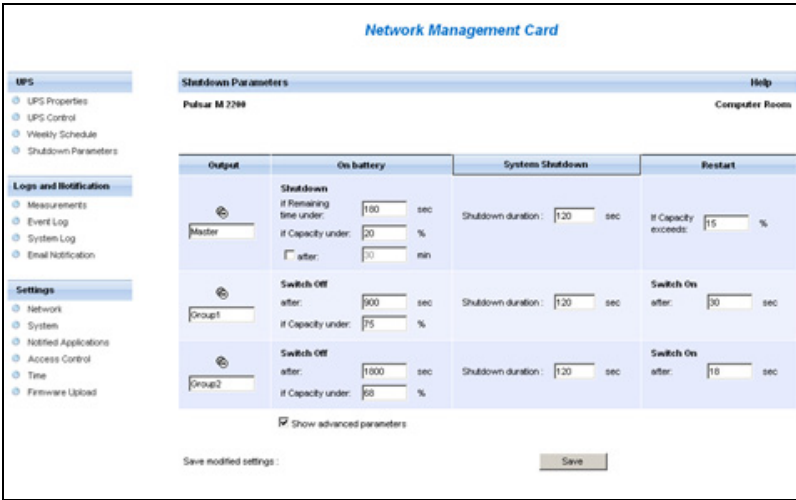
Figure 62. network management card Web Interface

Figure 63. UPS Shutdown and Restart Settings

Use Case #2

You want to have a shutdown after a predefined time of 10 min. The shutdown must occur, even if only one UPS is on battery.

- The IPP default configuration is available from **Settings > Shutdown > Edit Shutdown Configuration** (see Figure 64).
- In this case, each server can have its own shutdown timer (10 min, 8 min, 6 min…). To set a predefined time of 10 min, configure the shutdown timer for 10 min in the Edit Shutdown Configuration dialog box.

> **NOTE** This is the default configuration on the network management card (see "Use Case #1" on page 58).
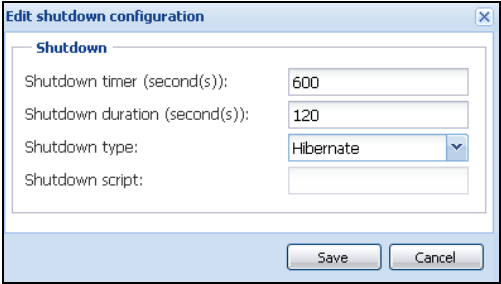
Figure 64. Edit Shutdown Configuration Dialog Box

Use Case #3

You want to start shutdown 10 min from the last detected Utility failure event. For this case, there are two UPSs, and one UPS is redundant. In addition, all servers are shut down at the same time.

- The network management card Shutdown default configuration is available from **UPS > Shutdown Parameters** (see Figure 65).

- For ConnectUPS-X-Slot or ConnectUPS-BD network cards, the NMC default shutdown configuration is available from **Configuration > UPS Shutdown and Restart Settings** (see Figure 63)

- To configure this shutdown, you must set a shutdown timer of 10 min for all network management cards. In this case, the last UPS sends the shutdown order after 10 min if it runs on battery. If the last UPS never runs on battery, the first UPS shuts down at the end of autonomy and the last UPS takes the load if it has the capacity. Otherwise, the shutdown occurs sooner.
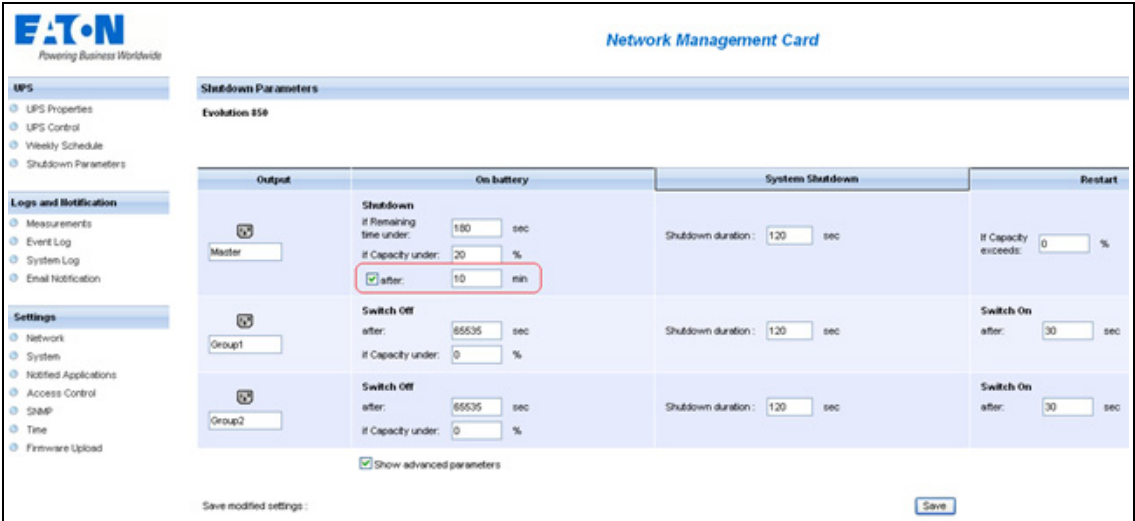
Figure 65. network management card Shutdown Parameters
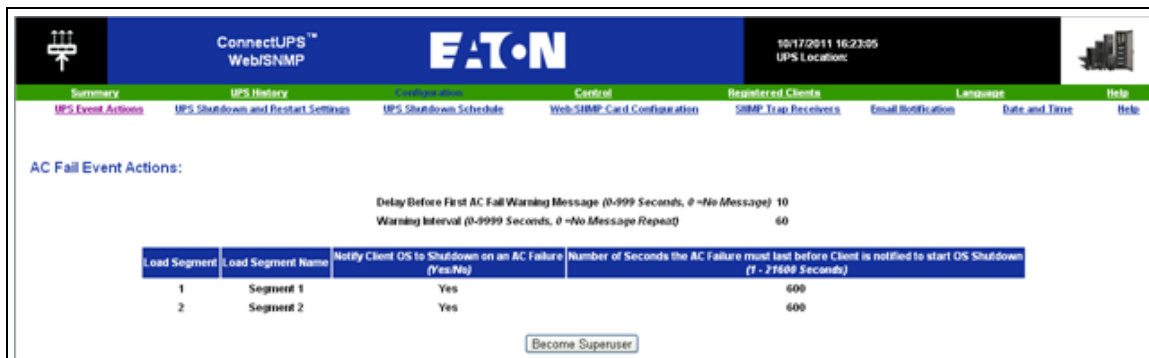
Figure 66. UPS Shutdown and Restart Settings

Use Case #4

You want to have a shutdown when 10 min remain for the last UPS. In this case, each server can have an individual shutdown duration, such as 10 min, 8 min, 3 min, and so forth.

- The IPP default configuration is available from **Settings > Shutdown > Edit Shutdown Configuration** (see Figure 67).

- You must configure a shutdown duration of 10 min in the Eaton IPP.

> **ℹ NOTE** This is the default configuration on the network management card (refer to "Use Case #3").
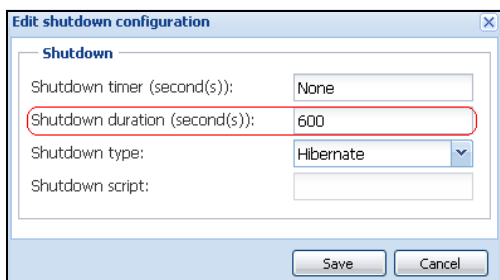
Figure 67. Edit Shutdown Configuration Dialog Box

- You must use the default Network Card Configuration. See "Use Case #1" on page 58 for more details.

Redundancy Advanced Behavior Example

For the following example uses a configuration with four UPSs. Each UPS is 20 kW. For this parallel topology, the load can vary between 0 and 80 kW.

Figure 68. Example Topology

Redundancy Alarm Management with Four Modules

According to the Redundancy level and the Load settings, the following details are provided:

• R is the number of redundant UPSs

• Status of Redundancy Lost Alarm

Table 7 provides redundancy alarm management details.

Table 7. Redundancy Alarm Management
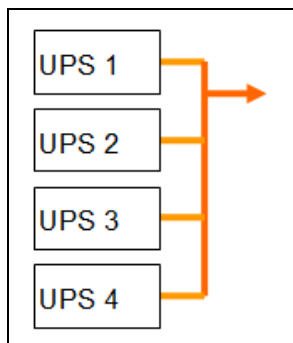
Load / Redundancy Level	Load < 20 kW	20 kW < Load < 40 kW	40 kW < Load < 60 kW	60 kW < Load < 80 kW
0	R=3	R=2	R=1	R=0
1	R=3	R=2	R=1	R=0 (Redundancy lost active)
2	R=3	R=2	R=1 (Redundancy lost active)	R=0 (Redundancy lost active)
3	R=3	R=2 (Redundancy lost active)	R=1 (Redundancy lost active)	R=0 (Redundancy lost active)

Protection Alarm Management with Four Modules

According to the Load and the Number of failed UPSs settings, the following details are provided:

• P is the number of UPSs protecting the load

• R is the number of redundant UPSs

• Status of Protection Lost Alarm

Table 8 provides protection alarm management details.

Table 8. Protection Alarm Management

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)

Table 8. Protection Alarm Management(Continued)

Load / Failures	Load < 20 kW	20 kW < Load < 40 kW	40 kW < Load < 60 kW	60 kW < Load < 80 kW
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)

Redundancy Compatibility

The following UPSs and topologies have been tested in redundant mode. Other topologies or UPSs may work, but have not been tested

Table 9 provides a compatibility list for single-phase UPSs and Table 10 provides a compatibility list for three-phase UPSs.

Table 9. Redundancy Compatibility (Single-phase UPS)

UPS	Parallel	Multiple Feed	Hot Standby	STS
9120, 9130, 9135	n/a	NET, USB	n/a	NET, USB
Eaton 5P / 5PX / Evolution / Evolution S	n/a	NET, USB	n/a	NET, USB
Pulsar EX 700 / 1500 (INTL and US)	n/a	NET, USB	n/a	NET, USB
Eaton M / X	n/a	NET, USB	n/a	NET, USB
Pulsar MX 1+1	NET	n/a	n/a	n/a
Pulsar MX Frame 16 U	n/a	NET, USB	n/a	NET, USB
EX RT	n/a	NET	NET (*)	NET

NOTE   n/a = Not applicable; NET = Acquisition through the network card; USB Acquisition through the USB; NET (*) = Behavior has not been implemented, but has been tested

Table 10. Redundancy Compatibility (Three-phase UPS)

UPS	Parallel	Multiple Feed	Hot Standby	STS
Blade UPS	NET	NET	n/a	n/a
9x55 (9155 and 9355)	NET	NET	n/a	n/a
9390	NET	NET	n/a	n/a
9395	NET	NET	n/a	n/a
Eaton 9E Essential	n/a	NET	n/a	n/a

NOTE   n/a = Not applicable; NET = Acquisition through the network card; USB Acquisition through the USB; NET (*) = Behavior has been implemented, but has not been tested

Chapter 7   Service and Support

If you have any questions or problems with the Eaton Intelligent Power Protector (IPP), call your **Local Distributor** or the **Help Desk** at one of the following telephone numbers and ask for a technical representative.

United States: **1-800-356-5737**
Canada: **1-800-461-9166 ext 260**
All other countries: **Call your local service representative**

Please have the following information ready when you call the Help Desk:

- Model number

- Serial number

- Version number (if available)

- Date of failure or problem

- Symptoms of failure or problem

- Customer return address and contact information

If repair is required, you will be given a Returned Material Authorization (RMA) Number. This number must appear on the outside of the package and on the Bill Of Lading (if applicable). Use the original packaging or request packaging from the Help Desk or distributor. Units damaged in shipment as a result of improper packaging are not covered under warranty. A replacement or repair unit will be shipped, freight prepaid for all warrantied units.

NOTE   For critical applications, immediate replacement may be available. Call the **Help Desk** for the dealer or distributor nearest you.