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1 Introduction

The new Eaton graceful shutdown application is called "Intelligent Power® Protector"

Intelligent Power® Protector:
- Provides local computer graceful shutdown
  - acquisition through Eaton UPSs USB or RS232 communication ports (Pulsar & Powerware series)
  - acquisition through Web/SNMP Cards (Network Management Card NMC Network-MS (ex 66102 / 103006826) and Modbus-MS (ex 66103), Connect UPS XSlot, PXGX 2000 P/N 103005868-5591, PXGX-UPS … (*)
  (*) Please refer to the "Compatibility list" Chapter for a comprehensive list of the supported cards
- Can be supervised by Intelligent Power® Manager.
- Can be managed by Intelligent Power® Manager (mass configuration / mass update/ … )
2 Installation

2.1 Installation Prerequisites

2.1.1 On the System Hosting « Intelligent Power® Protector »

Supported Operating Systems:
Intelligent Power® Protector can be installed on many systems, please refer to the Eaton compatibilities file: http://pqsoftware.eaton.com/install/common/eaton_os_compatibilities_aa.pdf

The Linux package is based on standard Linux mechanisms and therefore can be installed and used with other Linux distributions. Feedbacks / test or bug reports are welcome at EATON Support email address: (contact technical at eaton.com).

The Eaton compatibilities file http://pqsoftware.eaton.com/install/common/eaton_os_compatibilities_aa.pdf shows the compatibility between Intelligent Power® Protector and many Linux operating system.

Software compatibility limitations:
To avoid network or serial port access conflicts, you cannot install the Intelligent Power® Protector on a machine that also hosts:
- the Eaton Intelligent Power Manager (or Eaton Enterprise Power Manager)
- the Eaton Network Shutdown Module
- the Network Management Proxy
- Personal Solution Pac
- LanSafe and LanSafe Web View
- Netwatch

Standby configuration (Windows):
In Configuration Panel ▶ Power Option properties:
- You must unselect the Standby configuration of your Operating System to be compliant with the Intelligent Power Protector. With the standby configuration checked your system is not protected.
- If you want to save energy, please prefer the hibernate feature.

Driver installation
IPP installs all the necessary drivers (for USB communication). If Windows Operating System wants to install a driver from “Windows Update”, you can cancel this process.
2.1.2 On the System that Displays Web-based Graphical User Interface

The Eaton Intelligent Power® Protector graphical interface can be accessed remotely using a simple Web browser. Access to this interface can be secured through SSL connection and is also secured through Login & password.

The Intelligent Power® Protector graphical interface has been tested with:
- Google Chrome
- Mozilla Firefox
- Microsoft Internet Explorer 7+ (*)

For optimal performance, Google Chrome or Firefox is recommended.
(*) IE6 should work, however, performance is limited
For good performance Internet Explorer 9 or any later version are recommended.
2.2 Quick Start & Installation

To start in 5 minutes, please perform the following steps:

Step 1 (Installation)
On a Windows machine, run the “Intelligent Power® Protector” package under an administrator account.

A Web browser is automatically displayed (enter admin as Login / admin as Password and click on the Login button). A popup message advises you to change your default login / password.
Step 2 (Configuration)

When started, the application automatically performs a Quick scan. Using the Quick scan operation, you will discover:

- **Serial line connected UPSs (RS232 or USB)**
  The discovered UPS connected through (RS232 or USB) is automatically assigned as the Power source (the Status icon is Green 🟢)

- **Networked UPSs through broadcast within a few seconds**
  Quick Scan is compatible with following Web/SNMP Cards (Network-MS (ex 66102 / 103006826) and Modbus-MS (ex 66103), Connect UPS XSlot, PXGX 2000 P/N 103005868-5591, PXGX-UPS Card)
  The discovered UPS connected through (Network) are not automatically assigned as the Power source (You have to select the node and click on the button **Set as Power Source** the icon becomes Green 🟢)

The discovered nodes are displayed in **Settings ▶ Auto Discovery**

For the other nodes, please perform the discovery based on IP address ranges **(Range scan)**

Using the Range Scan operation you will discover the nodes that are outside of the Network segment

In the **Settings ▶ Shutdown** page, assign the IP address of the UPS that powers the local Computer.
In the **Settings ▶ User List** page, assign the access rights through “login and password”

Step 3 (Operation)

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

The **Events ▶ Event List** view allows you to view the device events.
2.3 Windows Installation

2.3.1 Graphical installation

Run the “Intelligent Power® Protector” package under an administrator account.

A Web browser is automatically displayed (enter admin as Login / admin as Password and click on the Login button).

Note:
If the browser does not open as planned, it should be started manually and pointed to http://127.0.0.1:4679
2.3.2 Installation / Uninstallation from command line

It is possible to install or uninstall the product from a command line in order to deploy the software massively and/or without graphical interface. This method also provides the ability to configure protection settings from the command line.

Detail of available command options can obtained using command:

<packageName> -help

<packageName> [COMMAND] [OPTION]...

Available commands:
- install      Launches the installation/upgrade process (default).
- uninstall    Launches the uninstallation process.

Available options:
- debug        Displays debugging information on the console.
- silent       Install the application silently.

Installation folder can be provided with:
- dir <installPath>

Power source settings can be provided with:
- sdn <login>:<password>@<address>,<loadSegment>,
   <shutdownDuration>,<shutdownTimer>,<shutoffControl>

Example:
<packageName> -install -silent -dir "C:\Program Files\MyFolder"
- sdn admin:admin@192.168.100.101,1,120,-1,1

will install IPP silently in C:\Program Files\MyFolder 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)

Once the installation is completed, open a Web browser open a Web browser with the following URL
http://<host>:4679/
<host> is the host name or IP address of the machine hosting IPP.
Installation Result

- If you install a new Intelligent Power® Protector release without uninstalling the old one you will keep your product settings.
- At the end of the installation, the following shortcuts are created in the group:

  Start ▶ Programs ▶ Eaton ▶ Intelligent Power Protector

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Eaton Intelligent Power Protector</td>
<td>Opens the &quot;Intelligent Power® Protector&quot; web page from default browser</td>
</tr>
<tr>
<td>Start Eaton Intelligent Power Protector</td>
<td>Starts the service</td>
</tr>
<tr>
<td>Stop Eaton Intelligent Power Protector</td>
<td>Stops the service</td>
</tr>
<tr>
<td>Uninstall Eaton Intelligent Power Protector</td>
<td>Uninstalls the Program</td>
</tr>
</tbody>
</table>

- A service called « Eaton Intelligent Power Protector » is also created for the Database Acquisition Engine.
  This service automatically starts on machine boot-up.
  This service provides the Web Interface.
- An alarm notification box, accessible from the System Tray icon displays the alarms on the local computer.

### 2.3.3 Uninstalling the Product

- From the Add/Remove programs item of the control panel, execute the “Eaton Intelligent Power Protector Vx.xx” package.
- You can also uninstall from the shortcuts:

  Start ▶ Programs ▶ Eaton ▶ Intelligent Power Protector ▶ Uninstall Eaton Intelligent Power Protector.

  This will remove the product and the custom files if you confirm it.
2.4 Linux Installation

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

2.4.1 Native installation on a RedHat, SuSe, Mandriva or derivative system:

1) Graphical installation
To install graphically, double click on the “Intelligent Power® Protector” .rpm package, The system will prompt for the root password, and then launch a graphical front-end, like RedHat's Package Installer below:

![Graphical installation](image)

2) Command line installation
To install from a command line, use the following 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%]

Once the installation is completed, open a Web browser with the following URL http://<@IP>:4679/<@IP> is the IP address of the machine hosting IPP
2.4.2 Native installation on a Debian or derivative system:

1) Graphical installation

**Pre-requisite:** On Debian 5 (Lenny), there is no default graphical installer present. So you should either use the command line installation described below, or install the package "gdeb" and "gdebi" and restart your graphical session to be able to complete the present procedure.

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

To install graphically, double click on the "Intelligent Power® Protector".deb package. The system will prompt for the root password, and then launch a graphical front-end, like Gdebi below:

![Graphical installation](image)

Click on the « Install Package » button. Once the installation is completed, open the menu « Application → Eaton → Intelligent Power Manager → Open » (in Gnome) and follow the « Configuration » chapter.

2) Command line installation

To install from a command line, use the following 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)...

Once the installation is completed, open a Web browser open a Web browser with the following URL:
http://<@IP>:4679/

<@IP> is the IP address of the machine hosting IPP
2.4.3 Generic installation on Linux

If your system doesn't derive from RedHat (using .rpm) or Debian (using .deb); you can install IPP using the generic package.

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

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

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

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

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

Once the installation is completed, open a Web browser open a Web browser with the following url http://<@IP>:4679/

<@IP> is the IP address of the machine hosting IPP
2.4.4 Uninstalling the Product

As for the product installation, if you have chosen the native packages, 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:

```bash
$ rpm -e ipp-linux
```

On Debian and derivatives, use:

```bash
$ dpkg -r ipp-linux
```

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

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

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

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

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

```bash
$ /installation/path/mc2-uninstall -silent
```
3 Configuration

3.1 Intelligent Power® Protector Settings

Start the "Intelligent Power® Protector" main graphical interface from the previously created shortcut, and then click on the Settings ▶ Auto Discovery menu item.

3.1.1 Discover the UPSs connected through USB/Serial

The first discovered UPS connected through (RS232 or USB) is automatically assigned as the Power source (the Status icon is Green 🟢).
3.1.2 Discover the nodes Connected on the Network

From the Settings ▶ Auto Discovery item; the following discovery methods are available:
- Quick Scan (automatically performed when application starts)
- Range Scan
- Address Scan

Notes:
- Each network node (Web/SNMP Card …) must have a valid IP address (or a DNS name) in the range that you have entered for auto-discovery. Refer to the compatibility list. “Intelligent Power® Protector” automatically receives the alarms (through notification or polling)
- Required Connect UPS XSlot/BD configuration:
  - 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 (this is the default setting since firmware version 2.02) or configure it correctly (IPP has to be configured in trusted host list)
- Required PXGX 2000 & PXGX-UPS cards configuration:
  - Set the IPP discovery password to the same value as the PXGX read community name (default is public)
  - In PXGX Access control page: disable SNMP access restricted by IP/Hostname or configure it correctly (IPP has to be configured in trusted host list)
  - In PXGX Take care to configure PXGX2000 in SNMP V1 or SNMP V1 + V3
- The Quick scan request is a Broadcast frame on 4679 IANA reserved port and 69 standard TFTP port. Using the Quick scan operation, you will discover through broadcast within a few seconds following Web/SNMP Cards (Network-MS (ex 66102 / 103006826) and Modbus-MS (ex 66103), Connect UPS XSlot P/N 116750221-001, PXGX 2000 P/N 103005868-5591, PXGX-UPS, …)
  - For the nodes outside of the Network segment, please perform the discovery based on IP address ranges (Range scan)
- Address Scan performs a single address scan

The discovered UPS connected through (Network) are not automatically assigned as the Power source (you have to select the node and click on the button Set as Power Source).
- The “Edit shutdown configuration” window opens automatically when the Power source is set. Please refer to the next paragraph to configure correctly the parameters.
- Once the power source is configured, the icon becomes Green or Grey if the communication fails).
3.1.3 Shutdown

Introduction
Intelligent Power® Protector provides local computer graceful shutdown with an acquisition through:
- USB/Serial
- Network (Web/SNMP Cards)

To configure shutdown, proceed as follows:
- Login with an administrator user profile
- From the Settings ➤ Shutdown menu item then the following page is displayed:

From this page, the configuration options are provided:
- Edit power source
- Edit shutdown configuration.
- Edit advanced shutdown criteria.
- Edit UPS configuration
- Test Access.
- Test shutdown.

These configuration options are described hereafter.
Power source

To configure Power Source, perform the following actions:

- Click on Edit Power Source.

In the Power source field select the UPS that powers the computer hosting Intelligent Power® Protector (This settings is also accessible through Settings › Auto-Discovery › Set as PowerSource)
- Check other parameters.
- Click on Save

Other parameters:

Load Segment: (Optional) the load segment that powers the server hosting IPP
Note: When “Master” is selected the entire UPS will switch off.

Access parameters: (When Power Source is managed through the network)
- If the Power source is a Web/SNMP Cards (Network-MS (ex 66102 / 103006826) and Modbus-MS (ex 66103)), Login and password are needed only if Intelligent Power® Protector has to set values in the Web/SNMP Card. (e.g. when changing the shutdown duration value)
- If the Power source is another Intelligent Power® Protector with “shutdown controller” feature activated, then Login and password are mandatory. The Login must be the “admin” account.

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

To configure Shutdown parameters, perform the following actions:

- Click on Edit shutdown configuration.

![Edit shutdown configuration](image)

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

**Shutdown duration**: The shutdown delay needed to properly shut down the computer.

**Shutdown type**:
- **Hibernate** (default option)
  If available with your operating system, it is better to use the hibernation feature (first available with Windows 2000) as there are a number of advantages. If the system is shut down, all work in progress and system information are automatically saved to the disk. The computer itself is also de-energized. When mains power returns, all the applications re-open exactly as they were and the user placed back in their work environment. 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.
  Note: If you select hibernate, but your computer does not have this function, Intelligent Power® Protector will still protect the installation by carrying out the normal (default) shutdown.
  Note: For Windows Vista, please refer to the FAQ section of this manual.
- **Shutdown**
  This option shuts down your applications and the system, but does not de-energize the computer. The system offers the user the choice to de-energize the computer, in which case it is the UPS that cuts power.
  On most computers, this configuration is necessary if you want the server to restart as soon as mains power returns.
- **Power-off**
  This option shuts down your applications and the system, and de-energizes the computer. This configuration is advised if you wish to be on hand when the system re-starts. (or for load shedding)
- **Script**
  This option manages the shutdown in a custom script that you can create to fit with your own shutdown sequence.
  You can integrate the standard Windows shutdown command (more info with shutdown /? in a Windows Command Line interpreter). **Shutdown script**: the absolute path of the script.

**Outlet shutoff Active**: Using this option, IPP will send a delayed shutoff command to the outlet. This delayed command is sent to the UPS at the beginning of the shutdown sequence, and this is the point of no return for this sequence. The outlet is turned off at the end of the shutdown sequence.
**Shutdown sequence trigger:**
When a power utility failure occurs, the shutdown sequence is started as soon as the first of the two following conditions is reached.
- After the **Shutdown timer** (if configured).
- When **WEB / SNMP UPS CARD or UPS shutdown criteria is reached**
  (UPS / WEB / SNMP UPS CARD  Decision according to many criteria see next figure)

![Shutdown Sequence Diagram](image-url)
Edit advanced Shutdown Criteria

Edit advanced Shutdown Criteria opens the “Edit advanced Shutdown Criteria” window:

Criteria definition:
- **Shutdown criteria is reached**: (enabled by default) 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 one or several events in the following events list. If these events are selected, they will trigger an immediate shutdown sequence when they occur.
  - **Redundancy lost** (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

**Note:**
When using a Virtual Power Source (in redundant configuration), only following criteria can be used:
- Shutdown criteria is reached
- Redundancy lost
- Protection lost
Edit UPS Configuration

Edit UPS Configuration opens the “UPS Configuration” screen. It is available for some UPSs connected through USB or serial. Otherwise, the parameters are displayed on “read only” through Network or if the UPS doesn’t support this feature.

You can configure following UPS parameters:
- Low Battery alarm level
- Load Segment restart delays
- Audible alarm

![UPS Configuration](image)

Test access

Test access checks if “Login and password” are correctly configured so that:
- IPP can update his shutdown configuration on the card or
- IPP can remotely access to the IPP shutdown controller.

Test shutdown

Test shutdown starts a shutdown procedure (According to the IPP parameters)
3.1.4 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 (local attached UPS through serial /USB)

Use Case #1: You want to keep your computer hosting IPP#1 alive as long as possible.

This is the default IPP#1 configuration. The next screenshot illustrates this IPP default configuration available from Settings ➔ Shutdown ➔ Edit Shutdown Configuration.

![Shutdown Configuration](image)

Use Case #2: To save battery backup time, you want to perform load shedding (stop your computer after a predefined time)

Configure a Shutdown timer value on IPP#1 (this configuration parameter is available from Settings ➔ Shutdown ➔ Edit Shutdown Configuration)
**Use Case #1:** You want to keep all your computers alive as long as possible

This is the default configuration for the IPPs and the Network-MS
IPP default configuration is available from [Settings ▶ Shutdown ▶ Edit Shutdown Configuration](#).
e.g. Network-MS (ex 66102 / 103006826) and Modbus-MS (ex 66103), WEB / SNMP UPS CARD default shutdown configuration is available from [UPS ▶ Shutdown Configuration](#) as illustrated on next screenshot:

**Use Case #2:** To save battery backup time, you want to stop all your computers after a predefined time.

On the WEB / SNMP UPS CARD, configure a Shutdown Criteria.
e.g. Network-MS (ex 66102 / 103006826) and Modbus-MS (ex 66103) WEB / SNMP UPS CARD shutdown configurations are available from [UPS ▶ Shutdown Configuration](#) Note: In this case the computer automatic restart is guaranteed.

**Use Case #3:** You want to perform load shedding on the specific computer hosting IPP#2 (i.e. stop the computer hosting IPP#2 after a predefined time)
On IPP#2, configure a Shutdown timer value (this configuration parameter is available from [Settings ▶ Shutdown ▶ Edit Shutdown Configuration](#))
Note: In this case the automatic restart for the computer hosting IPP#2 is not guaranteed
Note: Use Case 3 can be combined with Use Case 1 or Use Case 2
Architecture #3 (Network attached UPS through Shutdown Controller)

Use Case #1: You want to keep all your computers alive as long as possible.

This is the default shutdown configuration for the Shutdown Controller IPP#1 and other IPPs. 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 IPP#1 (Shutdown Controller) configure a Shutdown timer value. (this configuration parameter is available from Settings ▶ Shutdown ▶ Edit Shutdown Configuration)
Note: In this case the automatic restart for all the computers is guaranteed

Use Case #3: You want to perform load shedding on the specific computer hosting IPP #2 (stop the computer hosting IPP#2 after a predefined time).

On IPP#2, configure a Shutdown timer value (this configuration parameter is available from Settings ▶ Shutdown ▶ Edit Shutdown Configuration)
Note: In this case the automatic restart for the computer hosting IPP#2 is not guaranteed
Note: Use Case 3 can be combined with Use Case 1 or Use Case 2

Use Case #4: Typical example with 4 computers. According to the servers’ roles, you may want to shutdown the servers at different times:

- Computer hosting IPP#1 is directly attached to the UPS (USB/Serial) The shutdown Controller has to be installed on the server that will be the last one to shutdown.
  Note: On Pulsar series this computer has to be powered by the master outlet.
- Computer hosting IPP#2 is a computer that requires a long delay to shutdown (e.g. hosting database or VM-Ware)
- Computer hosting IPP#3 is a computer that requires being the last one to be shutdown (as other servers depend on it) (e.g. File server)
- Computer hosting IPP#4: is another server that has be stopped before computer B or C (Web server) or this computer can also be stopped for load shedding purpose. (Workstation)
Recommended configuration:

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

The following time diagram summarizes this configuration:
3.1.5 Configure Actions

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

From the **Settings ▶ Actions** item; the following channels are available:
- E-mail
- Execute script/program
- Notification to the local alarm notification box, available from the System Tray icon.

![Notifications summary window](image)

The **Create new action button** will display following interface:

![Create new action window](image)

**Notes:**
- The *** fields are required.
- Clicking on the pen icon starts an assistant to fill the field.

**Action active**: enables/disables the action.
**Action name**: user friendly name for the action.
Events filter:
You can filter the action according to:
- The Event criticalities. (Critical, Warning, Normal, Communication Lost).
- The Event category (All Events, Alarms, Shutdown events, Power events, Measures) refer to the list hereafter.
- The view that triggers the event (From view).

Note on Event Criticality parameter:
With this parameter, you can filter the notification according to the event level. Refer to the event list provided below in this document. If you select “Critical” as filter you will not receive the associated “Normal” event informing that the device status changes from “Critical” to “Normal”.

Action type: you can select following action: (Email / Command / Notification). According to your choice, specific settings are available for each action. The configuration of these 3 actions is detailed hereafter.

Detailed Alarms and events list in “Event category”:
Alarms:
- Utility failure
- Communication lost
- Shutdown Imminent
- Battery Low
- Internal Failure
- Overload
- Output On/Off
- Outlets On/Off
- Battery Fault
- On Automatic Bypass
- On Manual Bypass
- Redundancy Lost
- Protection Lost

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

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

Measures:
- Output Percent Load
- Battery Remaining Capacity
- Battery Run Time to Empty
- Main 1: Voltage, Current and Frequency
- Main 2: Voltage, Current and Frequency
- Output: Voltage, Current and Frequency
- Output Apparent Power
- Output Active Power
- Output Power Factor
E-mail:
This action is not active by default. Some of the fields are preconfigured by default.

Specific “email action” settings:
- **SMTP Server**: To receive emails on UPS events you have to indicate the SMTP server IP address.
- **Login, Password**: authentication information of the SMTP server.
- **Recipient**: Receiver Email address.
  Note: you can specify multiple receivers by separating them with coma.
- **Sender**: (Optional field) the email sender.
  Note that your SMTP server may require a valid email address.
- **Subject**: The email subject (can be customized with pre-defined variables).
- **Message**: The email message body (can be customized with pre-defined variables).
- **Digest**: you can specify that you want to receive a consolidation of the alarms that occurred during a delay that you can choose (if you specify none, each alarm will generate an e-mail. With this setting you will receive more emails for the same number of events.
  Possible values are: None / Every 10 seconds / Every minutes / Every hour / Every day
Notes:

- It is possible to duplicate an existing action already configured and just change some parameters.
- For advanced use, you can Customize the **subject** and **Message** e.g. if you have to translate an e-mail into an SMS (using an email to SMS external provider).

Clicking on the pen icon starts the **Edit message** assistant to fill the field with some variables. Click on the button to add a variable.
Command (Execute script/program):

![Command action configuration](image)

In order to execute a program on UPS events the program path will be required.

**Example to play sound alarms on events:**
Create a batch command file containing the command:
`mplay32.exe /play /close C:/WINDOWS/Media/<sound>.wav`
Create an action of type command calling this batch file.

**Notes:**
- **For Windows,** the program is executed under the SYSTEM account. For the right execution of some privileged commands, you may have to apply following procedure:
  - It may be necessary to modify the context before certain actions can be run.
  - To allow a user to run specific tools and programs with permissions that are different from those assigned to the user's account use the Windows “RunAs” Command which allows you to save the password (Windows XP Service Pac 2 and more recent versions).
  - Use the following Microsoft command:
    `runas /profile /user:<my login> /savecred <my_program.exe>`
  - On first execution a password is required, it is saved for subsequent executions.
- **For Linux,** the IPP process is running under root privilege (`sudo` command is not needed to execute a program or shell script).

**Notification (Alarm box notification):**

The Notification action is active by default.

![Notification action configuration](image)

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

This alarm box displays the last 10 alarms.
From the event section you can view more than 10 alarms.
The alarm notification box is accessible from the System Tray icon. Click on the icon to open the window that displays the alarms on the local computer.

A right click on the System Tray icon provides you a fast access to following functions:

### Open the notification box
- Open the web interface
- Start 'Intelligent Power Protector'
- Stop 'Intelligent Power Protector'

If a Power source has been declared, System Tray Icon can have following states:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Green Icon]</td>
<td>The System Tray Icon correctly receives alarms from Intelligent Power® Protector (AC is present on the Power source)</td>
</tr>
<tr>
<td>![Green Icon]</td>
<td>The System Tray Icon correctly receives alarms from Intelligent Power® Protector (The Power Source runs in battery mode)</td>
</tr>
<tr>
<td>![Yellow Icon]</td>
<td>The System Tray Icon correctly receives alarms from Intelligent Power® Protector (A Warning event occurred on Power Source)</td>
</tr>
<tr>
<td>![Red Icon]</td>
<td>The System Tray Icon correctly receives alarms from Intelligent Power® Protector (A critical event occurred on Power Source)</td>
</tr>
<tr>
<td>![Red Icon]</td>
<td>Communication with Power source has failed</td>
</tr>
</tbody>
</table>
Advanced events and actions customization:

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

You have the possibility to modify this script or create new scripts that define very specific events and actions. The sample script provides details about the expected structure and syntax for defining new actions and triggers.

To activate the execution of a script you have to set the enabled property to true as follows:

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

3.1.6 Configure User Accounts

Multiple user accounts can be configured.

From the Settings menu Item, select the User List item, then perform the following steps:

- Click on Add user.
- Set the User Login and the User password.
- Select the User’s Profile level. The following levels are available:
  - `admin` (the user will be able to access all the features)
  - `user` (the user will only access the supervision and is not able to set parameters to the system or nodes).
- Click on Create new user button.

![User Accounts window](image)

Intelligent Power® Protector contains a default Administrator profile with:

- admin as login
- admin as password

Warning:

- For security reasons, it is strongly recommended to change default password immediately after the installation.
- A Popup warns you on security if the password contains less than 8 characters.
Notes:
- The Login and Password is case sensitive
- The original admin account login value is fixed (admin) and its Password has to be modified
- There is no limit in the accounts number

3.1.7 System settings

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

- **Edit system information**: to enter contact and location information for IPP software.
- **Edit language** allows the user to change the user language.
  (Czech, English, French, German, Japanese, Korean, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Traditional Chinese are currently supported)
• **Edit scan settings**

Administrator can set authentication parameters which will be used by default to discover new devices. You can specify settings for 4 protocols: XML, SNMPv1, SNMPv3 and NUT. Depending on device supported protocols, IPM will choose needed parameters. See Compatibility List for protocol supports Default scan settings are displayed in the “Scan settings” section of “Settings/system” page.

In this dialog box, the administrator can:
- Activate the automatic scanner which will add any devices which is automatically discovered (i.e. without a direct scan action of the administrator, like the presence of a new auto-discovered card on the network).
- Activate protocols used by scanner by toggling protocol checkboxes.
- Set default scanner authentication settings for each protocol.

When discovered, manually or automatically, newly discovered devices will use these authentication parameters.
3.2 Configure node settings

Administrator can configure node information and access parameter by selecting nodes in the “Settings/Auto discovery” page then activating “Edit node information” or “Set node access parameters” actions.

Node access parameters

The “Access parameters” dialog box is displayed and let administrator edit authentication settings. Settings are set to all selected devices. Only relevant settings are set depending on selected device capabilities.

3.3 Node information

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

- **Edit update settings** will customize Automatic Updates Features. This feature gives you access to Eaton software updates. Intelligent Power® Protector will always be up to date if you select the **Check automatically** option. When a new software version is detected on www.eaton.com, just follow the wizard instructions.
  
  **Notes:**
  Intelligent Power® Protector settings will be retained with this operation
  Intelligent Power® Manager can manage updates with large number of computers (refer to chapter 5)

- **Check for updates** will check if a more recent version of the product is available on Eaton Web site
- **Module Settings** enables optional modules (e.g. Shutdown Controller)
3.3.1 Shutdown Controller

Introduction

Intelligent Power Protector can acquire UPS alarms from a UPS (through USB or RS232 or from SNMP/Web card (*) or Virtual Power Source (*)) and forward the shutdown alarms to the other Intelligent Power Protectors. This specific Intelligent Power Protector is called the “Shutdown Controller”.

(*) Note: This is a new feature available since IPP 1.20.

Activating "Shutdown Controller" feature

You have to activate the Shutdown Controller feature on the IPP 1 that relays the alarms (connected to the UPS through USB or RS232).

This option can be activated from Settings ▶ System ▶ Module Setting

Double click on Module settings then check the checkbox.

When this feature is activated on one IPP:

- A new view called "Notified Applications" appears in the menu of the Shutdown Controller IPP and the IPP top banner is updated with this graphical sign:

- Other IPPs will discover this IPP through a network scan. From these other IPPs configure the parameters in Setting ▶ Shutdown ▶ Configuration.

  The main parameters are:
  * Power Source (indicate the IP address of IPP1 that is the Shutdown Controller)
  * Load Segment
  * Login and Password (You must use “admin” account)

  Click on Save. Now your IPP is registered in the Notified Application view of the Shutdown Controller (refer to the next chapter).

Example with 3 computers (refer to the Shutdown Use Case for Architecture #3):

A UPS is locally connected (through USB) to computer 1 hosting IPP1 (Shutdown Controller)

- the IPP 1 automatically detects its UPS
- the user has to activate the “Shutdown Controller” feature for IPP1
- In IPP2 interface the user will have to indicate the IP address of IPP1 computer, the load segment and IPP1 Login and Password
- In IPP3 interface the user will have to indicate the IP address of IPP1 computer, the load segment and IPP1 Login /Password
- IPP1 will forward Shutdown alarms to remote IPPs (IPP2) (IPP3)
- As a consequence the 3 servers powered by this UPS are protected.

This is the corresponding Power flow view where 1 UPS powers 3 single feed Servers:

Notified Application view
The notified application View appears when the Shutdown Controller feature is activated. When the user selects a line, the right hand panels will be refreshed according to the selection.

**Status:**
- Green icon indicates that communication is OK between Local and Remote IPP
- Grey icon indicates that communication is lost between Local and Remote IPP

**Shutdown Diagram:**
The shutdown diagram is a time illustration of the shutdown sequence of the selected computer. It aims to present a visual representation of the shutdown sequencing between the different computers.
- The total width is the remaining runtime to empty of the power source (in case a power failure would happen or is in progress).
- The green part is the runtime to shutdown duration of the computer
- The orange part represents the computer shutdown duration.
- The red part is the computer off time.

**Note:**
The Notified Applications list is persistent.
The status of this remote IPP will change from OK to Communication Lost if you uninstall a remote IPP or if there is a communication lost event between the shutdown controller IPP and the remote IPP. With this mechanism the IT administrator will be able to monitor any change in the IT distributed architecture.
You can manually remove the IPPs from this list through the Autodiscovery » Remove Nodes.
4 Supervision

4.1 Access to the monitoring interface

To monitor the Power Source, start the main “Intelligent Power® Protector” interface. You can access the same interface locally or remotely.

4.1.1 Local access
- From the system where Intelligent Power® Protector is installed, you can use the following shortcut:
  Start ▶ Programs ▶ Eaton ▶ Intelligent Power Protector ▶ Open Eaton Intelligent Power Protector
- From a local machine, you can type the following URL in a Web browser
  https://127.0.0.1:4680/
  or
  http://127.0.0.1:4679/

4.1.2 Remote access
- From a remote machine, you can type the following URL in a Web browser
  https://<name or IP address of computer hosting IPM>:4680/
  or
  http://<name or IP address of computer hosting IPM>:4679/
- In SSL mode, accept the certificate using the procedure provided by your browser.
- Enter the Login and Password.
4.1.3 Power Source View

From the Views menu Item, select the Power Source item:

You will be able:

- to supervise the information from the UPS that powers the Intelligent Power® Protector computer
- to drag and drop the panels in this window
4.2 Panels list:

4.2.1 Information and status

This panel displays information on the device that powers the server running IPP.

The following node information is displayed in this panel:

- xxx.xxx.xxx.xxx: The DNS name (or IP address) is displayed near the “status icon”
- Description: The commercial product name
- Nominal Apparent Power: The UPS Nominal Apparent Power (in VA or KVA)
- IP address: The Web/SNMP card IP address (if network acquisition)
- Mac address: The Web/SNMP card Mac address (if network acquisition)
- Location: The device location (value of syslocation object or can also be configured in the Device page)
- Contact: The device contact (value of syscontact object or can also be configured in the Device page)
- Serial Number: The device Serial Number (if available)
- Link: Link to the 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: The device remaining backup time
- Master Output: Main output status (ON/OFF/Internal Failure/On Automatic Bypass/Manual By Pass/Overload)
- Group #x: Output outlet status (ON/OFF)

Note: The information displayed in this panel depends on the UPS capabilities.
4.2.2 Measures

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

4.2.3 Environment

This panel displays the selected device sensor information: Temperature, Humidity level, Dry contact status (Open/Closed) (This panel is only available when the source is a Web / SNMP card)

- Temperature  Sensor temperature (in °C)
- Humidity  Humidity level
- Input #1  Status of first contact (open / closed)
- Input #2  Status of second contact (open / closed)

4.2.4 Graph

This panel displays the graph of the main measures of the selected device. To read the values, proceed as follows: 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.
The button allows you to zoom in the graph. The button allows you to select the data you want to display in the graph (refer to following screenshot).

![Graph Settings](image)

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

### 4.2.5 Synoptic

This panel displays the selected device synoptic. In the top left corner, the UPS electrical topology is indicated (Online UPS, Line Interactive UPS, …). A tooltip is displayed when the mouse is over one of the functional block.

#### Synoptic Color codes:

<table>
<thead>
<tr>
<th>UPS modules:</th>
<th>AC/DC</th>
<th>DC/AC</th>
<th>By-Pass</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="Green" /></td>
<td><img src="image" alt="Green" /></td>
<td><img src="image" alt="Green" /></td>
<td>Green</td>
<td>Status OK &amp; Active</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Red" /></td>
<td><img src="image" alt="Red" /></td>
<td><img src="image" alt="Red" /></td>
<td>Red</td>
<td>Internal fault &amp; Inactive</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Grey" /></td>
<td><img src="image" alt="Grey" /></td>
<td><img src="image" alt="Grey" /></td>
<td>Grey</td>
<td>Status OK &amp; Inactive or Unknown</td>
</tr>
</tbody>
</table>

Battery module:
### Symbol | Color | Description
---|---|---
Green | Status OK  
Orange | Battery charge is less than 50%  
Red | Battery fault or End-of-backup  
Grey | Battery status unknown

### Electrical flows:

| Symbol | Color | Description  
---|---|---
Yellow | Current flow through the cable  
Note: the object animation gives the direction of current flow  
Grey | No current flow through the cable (Warning the cable may be under voltage)
Electrical power source at UPS input:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Source powered. Status OK</td>
<td></td>
</tr>
<tr>
<td>Grey</td>
<td>Source not powered or status unknown</td>
<td></td>
</tr>
</tbody>
</table>

Examples of combinations between flow status and power source status:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green/ Yellow</td>
<td>The electrical power source is powered and provides electrical flow</td>
<td></td>
</tr>
<tr>
<td>Green/ Grey</td>
<td>The electrical power source is powered and does not provide electrical flow</td>
<td></td>
</tr>
</tbody>
</table>

Load at UPS output: (its status is linked to that of the UPS output status)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Load powered and protected. Status OK</td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>Load not powered</td>
<td></td>
</tr>
<tr>
<td>Grey</td>
<td>Load status unknown</td>
<td></td>
</tr>
</tbody>
</table>

Examples of combinations between flow status and load status:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow/ Green</td>
<td>Load powered and protected</td>
<td></td>
</tr>
<tr>
<td>Grey/ Red</td>
<td>Load not powered</td>
<td></td>
</tr>
</tbody>
</table>

### 4.2.6 Events

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

### 4.2.7 Statistics

This panel displays the statistics of the selected node. The ✅ button allows you to select the time interval for the statistics. You can adjust the time interval by clicking on the 2 buttons with the “From” and “To” dates.

Here is the list of Statistics Computed Data:

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

**Note:** This information depends on device capabilities
4.3 Events

4.3.1 List representation

Select the Events > Events List and the following page appears:

![Alarms list]

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

All new alarms are stored in this log.

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

The following functions are available:

- **Acknowledge selected events** will add a check box in the Ack column for selected events
- **Acknowledge all events** will add a check box in the Ack column for all events

**Note:** When an alarm is acknowledged, it is marked with a checkbox but it is still viewable in this Event list. It decreases the number of non-acknowledged alarms at the bottom of the Web page.

The acknowledged alarms disappear in the Power Source > Event panel

- **Export Logs** will create a logs.csv file with the following syntax:
  
  "Date";"Node";"Type";"Level";"Object";"Value";"Message"

- **Purge Logs** Delete all logs (specify a date)
- **Select all** will select all displayed events
- **Deselect all** will deselect all selected events

**Tips:**

- You can select one alarm by clicking on it
- You can select several alarms with Shift Click or Alt click
- Then the selected lines appear in dark blue
4.3.2 Calendar representation

Select the Events ▶ Events Calendar and the following page appears:

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 date picker or shift-click command), events and statistics panels will give you all information for this selection and will automatically refresh when new statistics have been computed.

![Calendar View](image-url)
4.3.3 Nodes Events list

The icons in the different views represent the event severity.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Event status</th>
</tr>
</thead>
<tbody>
<tr>
<td>![CHECK Mark]</td>
<td><strong>Normal.</strong> With this event, the UPS device is coming back to a normal status.</td>
</tr>
</tbody>
</table>

**Event list (UPSs):**
- Communication with device is restored
- Communication restored with UPS
- The system is powered by the utility
- The UPS output is on
- Communication restored with UPS
- Battery OK
- UPS returns to normal load
- UPS OK
- Bypass : Return on UPS
- End of low battery alarm
- The outlet group 1 is on
- The outlet group 2 is on
- Communication failure with environment sensor
- Communication restored with environment sensor
- Humidity is in normal range
- Temperature is in normal range
- Input #x on
- Input #x off
- End of warning alarm
- End of critical alarm
- Redundancy restored
- Protection restored

![Warning Icon] | **Warning.** A problem occurred on the UPS device. Your application is still protected. |

**Event list (UPSs):**
- The system is powered by the UPS battery
- Output on automatic bypass
- Output on manual bypass
- Humidity is below low threshold
- Humidity is above high threshold
- Temperature is below low threshold
- Temperature is above high threshold
- Warning Alarm (a generic Warning alarm is active on the device)
- The device is under its load alarm threshold
- The device is over its load alarm threshold
- Protection lost
- Redundancy lost
- Shutdown in (time)
- Remote Communication Error (remote communication or configuration issue is detected)
Critical. A serious problem occurred on the UPS device. This problem requires an urgent action. Your application might NOT BE powered anymore.

Event list (UPSs):
- The UPS output is off
- The outlet group 1 is off
- The outlet group 2 is off
- Battery fault
- UPS overload
- UPS fault
- Low battery alarm
- Applications must stop immediately...
- System shutdown in progress...
- Critical alarm (a generic Critical alarm is active on the device)

Communication lost
Event list:
- Communication failure with Device or Application

4.4 Launching Device Web interface

From the Status panel, you can access the Web Page for Eaton cards including an on-board web server. Click on the web Link associated to this blue icon (http access) or this yellow one (https access).

Opening different Web interfaces from Intelligent Power® Protector.
5 Redundancy

5.1 Introduction

Intelligent Power® Protector provides management for composite devices. Composite devices are virtual nodes composed of nodes mounted with specific redundancy schemas (Redundant Supplies, Hot Standby or Static Transfer Switch for two components and Parallel for two or more components) and a dedicated redundancy level.

This Redundancy feature has to be enabled from the Settings ➤ System ➤ Modules Settings
Intelligent Power Protector will then shutdown a local computer powered by several UPSs (composite device).

Here are illustrated the electrical redundancy topologies:

**Redundant Supplies**

<table>
<thead>
<tr>
<th>UPS 1</th>
<th>Server 1</th>
<th>UPS 2</th>
<th>Server 2</th>
</tr>
</thead>
</table>

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

**Hot Standby**

<table>
<thead>
<tr>
<th>UPS 2</th>
<th>UPS 1</th>
</tr>
</thead>
</table>

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

- Login with an administrator user profile
- Select two or more nodes and click on the “Set composite device” menu item:

In the dialog box, enter redundancy mode and level, eventually specify a device name

**Device name**: User name of the composite device

**Redundancy mode**: Refer to the Introduction chapter to select the correct electrical topology (Parallel / Redundant Supplies / Hot Standby / Static Transfer Switch)

**Redundancy Level**: It is the minimal number of redundant UPSs powering your system:
The default value is 0.
If you set this parameter to a higher level you will receive the Redundancy Lost alarm when you don’t have enough redundant UPSs.
● Then the new node is created.
● You can see it in the “Auto discovery” node list:

You can select it as power source.

You can edit composite device properties by selecting it in the discovery view then click again on the “Set composite device” menu item.

If you select components of a composite device and click on the “Set composite device” menu item again, properties of existing composite device are shown; no new composite device is created so no composite device duplication is possible.
5.3 Redundancy views

5.3.1 Composite device in Power Source view

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

Redundancy view from Power Source view
5.3.2 Power Components sub view

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

We describe several typical use cases that will help you to configure properly the redundant shutdown sequence according to your needs.

Use Case #1

The user wants to have the longest backup time with the redundant configuration

- This is the default IPP configuration.
  The next screenshot illustrates this IPP default configuration available from Settings → Shutdown → Edit Shutdown Configuration.

- This is the default configuration on WEB / SNMP UPS CARD

- e.g. with Network-MS (ex 66102 / 103006826) and Modbus-MS (ex 66103), WEB / SNMP UPS CARD default shutdown configuration is available from UPS → Shutdown Configuration as illustrated on next screenshot:
Use Case #2

The user wants to have a shutdown after a predefined time of 10 mins. The shutdown has to occur even if only one UPS is on battery. In this case, each server can have its own shutdown timer (10 mins, 8 mins, 6 mins...)

- The user has to configure a shutdown timer of 10 mins in IPP. The next screenshot illustrates this IPP default configuration available from Settings ▶ Shutdown ▶ Edit Shutdown Configuration.

- this is the default configuration on WEB / SNMP UPS CARD (refer to previous use case)
Use Case #3

The user wants to have a shutdown starting 10 mins from the last detected Utility failure event. (We have 2 UPSs, one of them is redundant)
In this case, all servers shut down at the same time.

- This is the default IPP configuration
- The user has to configure a shutdown timer of 10 mins in all the WEB / SNMP UPS Cards
  In this case; the last UPS will send the shutdown order after 10 min. if it runs on battery. If the last UPS never run on battery, the first UPS will simply shutdown at the end of autonomy and the last UPS will take the load.(if it has the capacity, otherwise the shutdown will occur sooner)
  WEB / SNMP UPS CARD Shutdown configuration is available from UPS ▶ Shutdown Configuration as illustrated on next screenshot:

Use Case #4

The user wants to have a shutdown when the remaining time of the last UPS is 10 minutes
In this case, each server can have its own shutdown duration (10 mins, 8 mins, 3 mins…)
The user has to configure a shutdown duration of 10 mins in IPP.
The next screenshot illustrates this IPP default configuration available from Settings ▶ Shutdown ▶ Edit Shutdown Configuration.

This is the default configuration on WEB / SNMP UPS CARD (refer to previous use case)
5.5 Redundancy advanced behavior

For the following tables we take a parallel UPS configuration with 4 UPSs (Each UPS is 20 kW)
For this parallel topology, the Load can vary between 0 and 80 KW.

Redundancy alarm Management with 4 modules:

According to the user defined “Redundancy Level” and the “Load”, we detail following information:
- R is the number of redundant UPSs
- Status of Redundancy lost alarm

<table>
<thead>
<tr>
<th>Load / Redundancy Level</th>
<th>Load &lt; 20 KW</th>
<th>20 KW &lt; Load &lt; 40 KW</th>
<th>40 KW &lt; Load &lt; 60 KW</th>
<th>60 KW &lt; Load &lt; 80 KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>R=3</td>
<td>R=2</td>
<td>R=1</td>
<td>R=0</td>
</tr>
<tr>
<td>1</td>
<td>R=3</td>
<td>R=2</td>
<td>R=1</td>
<td>R=0</td>
</tr>
<tr>
<td>2</td>
<td>R=3</td>
<td>R=2</td>
<td>R=1 → Redundancy Lost active</td>
<td>R=0 → Redundancy Lost active</td>
</tr>
<tr>
<td>3</td>
<td>R=3</td>
<td>R=2 → Redundancy Lost active</td>
<td>R=1 → Redundancy Lost active</td>
<td>R=0 → Redundancy Lost active</td>
</tr>
</tbody>
</table>

Protection alarm Management with 4 modules:

According to the “Load” and the “Number of failed UPSs”, we detail following information:
- P is the number of UPSs protecting the load
- R is the number of redundant UPSs
- Status of Protection lost alarm

<table>
<thead>
<tr>
<th>Load / Failures</th>
<th>Load &lt; 20 KW</th>
<th>20 KW &lt; Load &lt; 40 KW</th>
<th>40 KW &lt; Load &lt; 60 KW</th>
<th>60 KW &lt; Load &lt; 80 KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>No failure.</td>
<td>P=4; R=3</td>
<td>P=4; R=2</td>
<td>P=4; R=1</td>
<td>P=4; R=0</td>
</tr>
<tr>
<td>1 failure.</td>
<td>P=3; R=2</td>
<td>P=3; R=1</td>
<td>P=3; R=0</td>
<td>P=3; R=0 → Protection Lost active</td>
</tr>
<tr>
<td>2 failures.</td>
<td>P=2; R=1</td>
<td>P=2; R=0</td>
<td>P=2; R=0 → Protection Lost active</td>
<td>P=2; R=0 → Protection Lost active</td>
</tr>
<tr>
<td>3 failures.</td>
<td>P=1; R=0</td>
<td>P=1; R=0 → Protection Lost active</td>
<td>P=1; R=0 → Protection Lost active</td>
<td>P=1; R=0 → Protection Lost active</td>
</tr>
<tr>
<td>4 failures.</td>
<td>P=0; R=0 → Protection Lost active</td>
<td>P=0; R=0 → Protection Lost active</td>
<td>P=0; R=0 → Protection Lost active</td>
<td>P=0; R=0 → Protection Lost active</td>
</tr>
</tbody>
</table>
5.6 Redundancy compatibility list

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

<table>
<thead>
<tr>
<th>UPS</th>
<th>Parallel</th>
<th>Multiple Feed</th>
<th>Hot Standby</th>
<th>STS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9120, 9130, 9135</td>
<td>NA</td>
<td>✓NET ✓USB</td>
<td>NA</td>
<td>✓NET ✓USB</td>
</tr>
<tr>
<td>Eaton 5PX, Evolution, Evolution S</td>
<td>NA</td>
<td>✓NET ✓USB</td>
<td>NA</td>
<td>✓NET ✓USB</td>
</tr>
<tr>
<td>Pulsar 700 / 1500 (Intl. &amp; US)</td>
<td>NA</td>
<td>✓NET ✓USB</td>
<td>NA</td>
<td>✓NET ✓USB</td>
</tr>
<tr>
<td>Pulsar M / EX</td>
<td>NA</td>
<td>✓NET ✓USB</td>
<td>NA</td>
<td>✓NET ✓USB</td>
</tr>
<tr>
<td>Pulsar MX 1+1</td>
<td>✓NET</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Pulsar MX Frame 16 U</td>
<td>NA</td>
<td>✓NET ✓USB</td>
<td>NA</td>
<td>✓NET ✓USB</td>
</tr>
<tr>
<td>EX RT</td>
<td>NA</td>
<td>✓NET</td>
<td>✓NET (*)</td>
<td>✓NET</td>
</tr>
</tbody>
</table>

**UPS Compatibility List for Redundancy on 1-phase UPSs**

<table>
<thead>
<tr>
<th>UPS</th>
<th>Parallel</th>
<th>Multiple Feed</th>
<th>Hot Standby</th>
<th>STS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade UPS</td>
<td>✓NET</td>
<td>✓NET</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>9x55 (9155 and 9355)</td>
<td>✓NET</td>
<td>✓NET</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>9390</td>
<td>✓NET</td>
<td>✓NET</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>9395</td>
<td>✓NET</td>
<td>✓NET</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Eaton 9E Essential</td>
<td>NA</td>
<td>✓NET</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**UPS Compatibility List for Redundancy on 3-phases UPSs**

✓NET: Acquisition through the Network Card
✓USB: Acquisition through USB
NA: Not Applicable
✓NET (*): Behavior has been implemented, but has not been tested
6 Advanced Management

The Intelligent Power® Manager (1.12 minimum version) can remotely:

- Display an Intelligent Power® Protector configuration.
- Configure a single Intelligent Power® Protector.
- Synchronize multiple Intelligent Power® Protector configurations.
- Trigger the Intelligent Power® Protector Upgrade

More details are available in Intelligent Power® Manager user’s manual. (You can evaluate the free version to manage up to 10 nodes from http://powerquality.eaton.com)
7 Compatibility List

Eaton has tested the compatibility of Eaton Power Protector with the following devices and applications:

7.1 Eaton Serial line Devices

<table>
<thead>
<tr>
<th>Eaton Equipment designation</th>
<th>Connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eaton Powerware series: 3105, 5110, 5115, 5130, 9130, 9135, 9140 and legacy 9120, 9125</td>
<td>USB or RS232</td>
</tr>
<tr>
<td>Eaton Powerware series: BladeUPS, 5125, 9155, 9355, 9390, 9395</td>
<td>RS232 only</td>
</tr>
<tr>
<td>Eaton Pulsar Series: EX RT Comet EX RT 1:1 / 3:1 / EX 5 RT (Asia/Pacific)</td>
<td>RS232 only</td>
</tr>
</tbody>
</table>

Notes:
- XSlot-USB Module for Powerware series is unsupported by Intelligent Power® Protector 1.10
- Ellipse ASR 600/750/1000/1500 USBs, Ellipse MAX, Protection Station, Protection Center, NOVA AVR, are currently supported by Personal Solution Pac software.

7.2 Eaton Network Devices

<table>
<thead>
<tr>
<th>Eaton equipment designation</th>
<th>Type</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Management Card MiniSlot SNMP/Web – Network-MS (ex 66102) (DA firmware revision and above) And associated Environment Sensor</td>
<td>UPS Option Card Eaton Pulsar</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>Network Management Card &amp; Modbus/JBus – Modbus-MS (ex 66103) (through Ethernet Network) And associated Environment Sensor 66846</td>
<td>UPS Option Card Eaton Pulsar</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>ConnectUPS-MS MiniSlot Network Management Card Network-MS (ex 103006826) And associated Environment Sensor</td>
<td>UPS Option Card Eaton Powerware</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>ConnectUPS-BD Web / SNMP P/N 116750222-001 (**) And associated Environment Sensor</td>
<td>UPS Option Card Eaton Powerware</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>ConnectUPS-XSlot Web / SNMP/xHubCard, P/N 116750221-001 (*) (**) And associated Environment Sensor</td>
<td>UPS Option Card Eaton Powerware</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>PXGX-UPS Card</td>
<td>UPS Option Card Eaton Powerware</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>PXGX2000 P/N 103005868-5591 (<em>) (</em>**)</td>
<td>UPS Option Card Eaton Powerware</td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Note: Connect-UPS-E for Powerware series should be compatible, but Eaton didn’t perform official testing on it.
With Intelligent Power Protector 1.10, the Eaton Powerware 3 phase UPSs compatibility is officially available according to the following solution:

- **Cards**: ConnectUPS-X v4.32 or PXGX2000 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 will not be supported by this 1.10 release.

Required Connect UPS XSlot/BD configuration:
- 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 (this is the default setting since firmware version 2.02) or configure it correctly (IPP has to be configured in trusted host list)

Required PXGX 2000 / PXGX-UPS configurations:
- Set the IPP discovery password to the same value as the PXGX read community name (default is public)
- In PXGX Access control page: disable SNMP access restricted by IP/Hostname or configure it correctly (IPP has to be configured in trusted host list)
- In PXGX Take care to configure PXGX in SNMP V1 or SNMP V1 + V3

### 7.3 Eaton Legacy cards

These cards should be compatible, but Eaton didn’t perform official testing on them.

<table>
<thead>
<tr>
<th>Eaton equipment designation</th>
<th>Type</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGE Network Management Card MiniSlot SNMP/Web – 66244 And associated Environment Sensor</td>
<td>UPS Option Card (legacy)</td>
<td><img src="image1.png" alt="Eaton Equipment Illustration" /></td>
</tr>
<tr>
<td>Network Management Card Transverse SNMP/Web – 66074 And associated Environment Sensor</td>
<td>UPS Option Card (Legacy)</td>
<td><img src="image2.png" alt="Eaton Equipment Illustration" /></td>
</tr>
</tbody>
</table>
### 7.4 Network Ports

Here is the list of Network ports used by IPM and IPP:

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Mode/Port</th>
<th>Network MS/</th>
<th>PXGX2000,</th>
<th>IPP with Shutdown controller</th>
<th>IPP</th>
<th>IPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMTP</td>
<td>TCP/25</td>
<td>OUT</td>
<td>OUT</td>
<td>OUT</td>
<td>OUT</td>
<td>OUT</td>
</tr>
<tr>
<td>DHCP/BOOTP</td>
<td>UDP/67</td>
<td>OUT</td>
<td>OUT</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>TFTP</td>
<td>UDP/69</td>
<td>IN</td>
<td>x</td>
<td>OUT</td>
<td>OUT</td>
<td>OUT</td>
</tr>
<tr>
<td>HTTP</td>
<td>TCP/80</td>
<td>IN</td>
<td>IN</td>
<td>OUT</td>
<td>OUT</td>
<td>OUT</td>
</tr>
<tr>
<td>NTP</td>
<td>UDP/123</td>
<td>OUT</td>
<td>OUT</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>SNMP</td>
<td>UDP/161</td>
<td>IN</td>
<td>IN</td>
<td>OUT</td>
<td>OUT</td>
<td>OUT</td>
</tr>
<tr>
<td>SNMP Traps</td>
<td>UDP/162</td>
<td>OUT</td>
<td>OUT</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>UNMP</td>
<td>UDP/200</td>
<td>x</td>
<td>OUT</td>
<td>IN/OUT</td>
<td>IN/OUT</td>
<td>IN/OUT</td>
</tr>
<tr>
<td>HTTPS</td>
<td>TCP/443</td>
<td>IN</td>
<td>IN</td>
<td>OUT</td>
<td>OUT</td>
<td>OUT</td>
</tr>
<tr>
<td>EATON Supervision</td>
<td>TCP/4679</td>
<td>x</td>
<td>x</td>
<td>IN/OUT</td>
<td>IN/OUT</td>
<td>T</td>
</tr>
<tr>
<td>EATON Notification Broadcast</td>
<td>UDP/4679</td>
<td>IN/OU</td>
<td>x</td>
<td>IN/OUT</td>
<td>IN/OUT</td>
<td>T</td>
</tr>
<tr>
<td>EATON SSL Supervision</td>
<td>TCP/4680</td>
<td>x</td>
<td>x</td>
<td>IN/OUT</td>
<td>IN/OUT</td>
<td>T</td>
</tr>
<tr>
<td>EATON Alarms Broadcast</td>
<td>UDP/4680</td>
<td>OUT</td>
<td>x</td>
<td>IN</td>
<td>IN</td>
<td></td>
</tr>
<tr>
<td>EATON Connected Alarms</td>
<td>TCP/5000</td>
<td>IN</td>
<td>x</td>
<td>OUT</td>
<td>OUT</td>
<td></td>
</tr>
<tr>
<td>EATON Connected Alarms</td>
<td>TCP/5001</td>
<td>x</td>
<td>x</td>
<td>IN</td>
<td>OUT</td>
<td>OUT</td>
</tr>
</tbody>
</table>
8 FAQ and Error messages

In the HTML pages:

<table>
<thead>
<tr>
<th>Cannot display the UPS properties page. HTTP 404 error with IE.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solution:</strong> Check the URL entered.</td>
</tr>
<tr>
<td>• https://&lt;name or IP of the computer hosting IPP&gt;:4680/</td>
</tr>
<tr>
<td>or</td>
</tr>
<tr>
<td>• http://&lt;name or IP of the computer hosting IPP&gt;:4679/</td>
</tr>
</tbody>
</table>

In Ubuntu's Software Center:

<table>
<thead>
<tr>
<th>Message “The package is of bad quality”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solution:</strong> This is a known issue specific to Ubuntu Software Center. Just click the &quot;ignore and install&quot; button.</td>
</tr>
</tbody>
</table>

In the Linux Graphical System integration:

<table>
<thead>
<tr>
<th>Linux (Debian and Ubuntu, with Gnome) Eaton-Intelligent Power Manager - &quot;Open&quot; shortcut is not present</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solution:</strong> The menu shortcut will appear the next time you will launch Gnome.</td>
</tr>
<tr>
<td>In the meantime, simply open a web browser and enter the following URL: <a href="http://localhost:4679/">http://localhost:4679/</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Linux (OpenSuSe 11, with KDE) Eaton-Intelligent Power Manager - &quot;Open&quot; shortcut is not visible</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solution:</strong> To find IPP icon, use the 'Search' function from the Application Menu.</td>
</tr>
<tr>
<td>You should then find IPP icon in the Favorites section.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Linux (Red Hat, OpenSuSe and Mandriva) Notification icon (&quot;system tray icon&quot;) is not started upon installation or upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solution 1:</strong> Launch the following command, as your standard user, from a terminal or using a &quot;Launch&quot; feature:</td>
</tr>
<tr>
<td>$ /usr/local/Eaton/IntelligentPowerProtector/mc2 -systray</td>
</tr>
<tr>
<td>Note that if you launch this command from a terminal, you will need to add an ampersand (&quot; &amp;&quot;) at the end of the command line, in order to detach the process.</td>
</tr>
<tr>
<td><strong>Solution 2:</strong> Close your graphical session, and log into a new one.</td>
</tr>
<tr>
<td>The notification icon will be automatically started with the new graphical session.</td>
</tr>
</tbody>
</table>
Linux (Unity desktop)
Eaton-Intelligent Power Manager - "Open" shortcut is not present

**Solution:** Open a terminal and type the following line:

```bash
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
```

After this you can type "open" in the search box of the unity menu to retrieve the "Open" shortcut.

You can also simply open a web browser and enter the following URL: http://localhost:4679/

**In the Linux Network System integration:**

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

**Solution:**
Create a file name `proxy.cfg` under
`/usr/local/Eaton/IntelligentPowerProtector/configs/` with the following content:

```json
{
    'proxyHost': "your.proxy.address.com",
    'proxyPort': "proxy_port"
}
```

For example:

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

Then restart IPP to reload the configuration

Linux:
IPP Linux displays the Network Communication lost alarm after 20 minutes only

**Solution:**
Improvement in a next release

**When activating Shutdown Controller under Linux**

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

**Solution:**
The issue can be easily solved by restarting the IPP daemon once the “Shutdown Controller” module has been activated. There is no need to restart the IPP daemon when disabling this feature.
### In Events and actions with some Windows x64 bits OS

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

This is a problem of some Windows x64 OS versions (e.g. XP x64 and 2003 x64). This problem doesn’t appear on Windows 7 x64 for example.

**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"

### In Windows Vista Hibernate sequence:

By default IPP runs an Operating System hibernate. Unfortunately, the Hibernate option of Windows Vista is sometimes no more available after a "Disk Cleanup".

In this case Windows Vista hibernate fails.

**Solutions:**
- Change the IPP shutdown configuration from “Hibernate” to “Shutdown”
- Or
  - Execute the command "Powercfg -h on" under an administrator account, to restore the Windows Vista hibernate option.

http://support.microsoft.com/default.aspx?scid=kb;EN-US;928897#LetMeFixItMyself

### In shutdown sequence:

PW 9130 UPS doesn’t shutoff as expected when IPP is connected through USB/Serial and when a Web SNMP card is plugged into the slot

**Solution:** you have to disable the UPS shutoff command from the card interface to ensure a proper shutdown of your machine protected by IPP.

For that, 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.
9 Glossary

IP address
When TCP/IP is installed on a computer, an address is assigned to the system. Each address is unique and is made up of four numbers, each between 0 and 256 (e.g. 168.8.156.210).

NMS (Network Management System)
The NMS supervises SNMP devices connected to the TCP-IP Network.

Network Shutdown Module
The Network Shutdown Module is a software module that uses the information transmitted by the Network Management Card/Proxy to inform computer users on the current status of the electrical power supplied to the computer.
If the supply of the electrical power from the UPS is at risk, the Network Shutdown Module initiates an orderly shutdown of the computer under the most secure conditions possible.

SSL (Secure Socket Layer, created by Netscape)
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 (where RSA means Rivest, Shamir and Adleman, the inventors). An RSA key is the result of operations involving prime numbers. SSL is built into the Internet browsers on the market. The padlock in the bottom of your browser screen is automatically displayed if the server sending information uses SSL.

TCP/IP (Transmission Control Protocol / Internet Protocol)
Family of protocols for the transport and network layers.
10 Acknowledgements

Huge thanks from the Eaton software development team to the following projects:

**Spider Monkey**

**JSMiniNSPR**

**Ext JS**

**SQLite**
the SQLite Project http://www.sqlite.org/
Their generous donation of the source code to the public domain helped us for this project.

**Open SSL**
- This IPP product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/)
- This IPP product includes cryptographic software written by Eric Young (eay@cryptsoft.com)
- This IPP product includes software written by Tim Hudson (tjh@cryptsoft.com)

**Lib USB**

**Net SNMP**

**PuTTY executables**

The full License version for each of these projects is available from Intelligent Power Protector (Settings ➤ System ➤ About)