

Eaton Intelligent Power[®] Protector

User's Guide



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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 »

2.1.1.1 Supported Operating Systems:

Intelligent Power[®] Protector can be installed on following systems:

9		
•	Windows (x86_64)	8 / 2012 / 7 / 2008 /2008 R2 / Vista / 2003 / XP
•	Windows (x86)	8 / 2012 / 7 / 2008 / Vista / 2003 / XP / 2000
•	Linux (x86/x86_64)	
	Debian GNU Linux:	5, 6
	SUSE/Novell:	SLES 11, OpenSUSE 11.2, 11.4
	RedHat Enterprise Linux:	RHEL 5.4, 5.5, 6 , Fedora core 14, 15
	Ubuntu:	10.04 LTS, 10.10, 11.04
	Unix	
	HP-UX (PA-RISC)	11.31
	IBM AIX (Power)	6.1
	IBM AIX (Power)	7.1
	Oracle (Sun) Solaris (x86)	11
	Oracle (Sun) Solaris (Sparc)	10
Vi	rtual Environments:	
ı	VMware:	ESX 5.1, 5.0, 4.0, 4.10, ESXi 4.0& 4.1 (pay version only)
		ESXi 5.1, 5.0 (pay version only)
1	• Hyper-V:	Hyper-V and Hyper V Server R1, R2
1	• XEN	Citrix XenServer 5.6, 6.0 Open Source Xen 2.6 on RHEL 5, Open Source Xen 3.2 on Debian 5.0
ı	• KVM	KVM 0.12.1.2 on RHEL 6 and Debian 5

For the installation in these specific "Virtual Environments", please refer to the user manual appendix that describes the specific steps for those environments.

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: (contacttechnical at eaton.com).

The following list is not exhaustive. Intelligent Power Protector **should be** compatible with:

	-	-
•	Linux (x86/x86_64)	
	SUSE/Novell:	SLES 10, OpenSUSE 10.3
	RedHat Enterprise Linux:	Fedora core 13
	Ubuntu:	8.04 LTS
	Mandriva:	2010, 2011
	CentOS:	5.4, 5.5, 6

 Unix HP-UX (PA-RISC) 11.11, 11.21 IBM AIX (Power) 5.3

2.1.1.2 Software compatibility limitations:

To avoid network or serial port access conflicts, you can not 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
- NUT (Network UPS Tools)

2.1.1.3 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.

2.1.1.4 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 (tested with 14)
- Mozilla Firefox (tested with 5 and 6)
- Iceweasel
- Microsoft Internet Explorer (*) 7, 8, 9, 10
- Opera 10

For optimal performance, Google Chrome or Firefox 6 is recommended. For good performance Internet Explorer 9 or any later version are recommended. (*) IE6 should work, however, performance is limited

Note: IPP for Unix does not require the use of a web browser.

2.2 Quick Start & Installation

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

Step 1 (Installation)

On a Windows 2000/XP/2003/Vista/2008/7/8, Linux, machine, run the "Intelligent Power[®] Protector" package under an administrator account.

፪ Eaton Intelligen	t Power Protector Installer	_ 🗆 🗙
FAT-N	Intelligent Power Pr	otector
Powering Business	Worldwide	V1.00
▶ Welcome	Welcome to Eaton Intelligent Power Protector installer	
License		
Select Path		
Installation		
Finish		
	Cancel Ne	xt >

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.

What is Eaton Intelligent Power Protector? Intelligent Power Protector is protection software offered from Eaton Corporation at 'no charge'. It enables users to avoid data loss by gracefully shutting down computers and servers powered by an Eaton UPS in the event of an extended power outage. This software provides a clear, easy-to-use, multilingual interface from any PC with an Internet browser. Exceptionally versatile, Intelligent Power Protector acquires UPS information through local or network computers	Login: Password:	admin •••••
Exceptionally versatile, intelligent Power Protector acquires UPs information through local or network		
Intelligent Power Protector can be remotely managed, configured and updated with our Intelligent Power Manager supervisory software. Intelligent Power Manager can be downloaded for no charge from Eaton for supervising / monitoring of a network of up to ten devices. Versions of Intelligent Power Manager for supervising / monitoring many devices may be purchased through an Eaton		

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 \bigcirc)

=> 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 (2))

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

Step 3 (Operation)

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

FAT•N II	ntelli	gent Power [®] Protector	• Help	Q.
Views	« @	Power Source		6
🖃 🚖 Views				0
Power Source		Information and Status	Measures	
Events		166.99.224.119	Input frequency	50 Hz
Events List		Description Description Description	Input voltage	233 V 50 Hz
Events Calendar		Description Evolution 5 Nominal apparent power 550 V	A Output voltage	233 V
Settings		IP address 166.99.224.1	9 Output current	0 A
Auto Discovery		Mac Address 00:20:85:FD:76:	Global apparent power	161 VA
Butdown		Serial number AV0J190	H Global active power	121 W
A System		Class Network Management Card / H	A Battery output voltage	13 V
Log		Location 1A	19	
Ser List		Link	Environment	+
		Betteru stote	Synoptic	
			Line Interactive LIPS	
		Power source 🕜 On uni		
		Load level 29		
		Battery capacity 100	Master output	
		Battery run time 12 min 03	is 💼 🚽	
		Master output: Maître	Dn Load segment #1	
		Load segment #1: Groupe #1	on 🛛 👘 👘 👘	
		Load segment #2: Groupe #2	on Load segment #2	
		Graph - 2 hours		
			Statistics - 7 days	=+
			Events	•
		[m-1		
		06/03/10 - 7:49:16 am 🧭 06/03/10 - 9:49:16 ar	1	

The **Events** \rightarrow **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.

🖥 Eaton Intelligent	t Power Protector Installer	
E-T-N	TATON Intelligent Power	
Powering Business	Worldwide	V1.00
▶ Welcome	Welcome to Eaton Intelligent Power Protector installer	
License		
Select Path		
Installation		
Finish		
	Cancel Nex	t >
Y	Cancel Nex	t>

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>

Example:

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

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

Once the installation is completed, 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

Name	Description
Open Eaton Intelligent Power Protector	Opens the "Intelligent Power [®] Protector " web
	page from default browser
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 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:

	Installing packages	
S	Installing packages The following packages will be installed.	
ipp-linux Eaton Inte	-1.10.035-1.x86_64 lligent Power Protector	
	X Cancel	Apply

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:

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: <u>http://bugs.debian.org/585183</u>

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:

Eile Help & Package: ipp-linux Beinstall Pack	
Package: ipp-linux Reinstall Pac	
	ckage
Status: Same version is already installed	
Description Details Included files	
Eaton Intelligent Power Protector	
Intelligent Power Protector is protection software offered from Eaton Corporation at 'no charge'. It enables users to avoid data loss by gracefull shutting down computers and servers powered by an Eaton UPS in the eve of an extended power outage. This software provides a clear, easy-to-use multilingual interface from any PC with an Internet browser.	y ent
Exceptionally versatile, Intelligent Power Protector acquires UPS informate through local or network communication and can be easily deployed on many computers.	ion
Intelligent Power Protector can be remotely managed, configured and updated with our Intelligent Power Manager supervisory software. Intellig Power Manager can be downloaded for no charge from Eaton for supervising / monitoring of a network of up to ten devices. Versions of Intelligent Power Manager for supervising / monitoring many devices may purchased through an Eaton authorized reseller.	ent / be

Click on the « Install Package » button. Once the installation is completed, open the menu « Application \rightarrow Eaton \rightarrow Intelligent Power Manager \rightarrow 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: \$ rpm -e ipp-linux

On Debian and derivatives, use: \$ 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):

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

If you have chosen the generic installer, use the following command for interactive uninstall (as root): $\$ /installation/path/mc2 -uninstall

For silent uninstall add the -silent parameter as shown below (as root):
\$ /installation/path/mc2 -uninstall -silent

2.5 Unix Installation

Introduction

IPP for Unix is available as a tar archive, that includes native package (.depot, .local or .rpm) and a script to guide you through the installation and configuration process.

2.5.1 Installation on HP-UX, Solaris and IBM AIX

On a supported Unix machine (HP-UX, Solaris, Aix), install the "Intelligent Power[®] Protector - Unix" package from a terminal, under the root account, by following the steps below.

Note: This procedure assumes an installation on Solaris Sparc. Please adapt the tar archive file name according to your situation.

Uncompress the tar archive

gunzip ipp-solaris-1.40-4.sparc.tar.gz tar xvf ipp-solaris-1.40-4.sparc.tar

- · Switch to the package directory
 - cd ipp-solaris-1.40-4.sparc
- Execute the installer

./install.sh

A Welcome text screen will be displayed, to assist you in configuring Intelligent Power Protector for Unix.

2.5.2 Uninstalling the Product

You can uninstall IPP – Unix by using the following command line, as root. \$ /usr/local/ups/bin/uninstall-ipp

3 Configuration

3.1 Intelligent Power[®] Protector Settings

Note: This chapter does not apply to IPP for Unix. Please refer to chapter 3.2.

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 -

FAT•N	Inte	ntelligent Power Protector							
Views	« @	Node List						R Quick scan	
🖃 😋 Views		Туре	Status	Name	Description	Class	Serial number	🔏 Range scan	
- Power Source			0	Pulsar 1000 RT2U - 1 Y2/50071	Pulsar 1000 RT2U	USB device	1Y2I50071	Address(es) scan	
Events List Events List Events List Events Calendar Settings Auto Discovery Actions Systudown								Set node access parameters CEdt node information Remove nodes Select al Deselect al	
- 🥵 System - 📋 Log - 🍰 User List								gr Jei as puwer source	

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).

FAT-N	Intell	ige	ent	Power®	Prote	ctor		• Logo • Help	ut 'admin'
Views	< 0	Nod	e Lis	t					Requick scan
Ciews C		Т []]	St	Name 166.99.224.112	Mac Addr 00:20:85:	Class Network Managem	Location Computer	Contact Compute	Address(es) scan
∎ Events List ∎ Events Calendar ⊒ 😋 Settings			8	166.99.224.178/ 166.99.224.150/	00:20:85:	Intelligent Power Pr Intelligent Power Pr	1A09	Luc	CEdit node information
- Auto Discovery - C Actions - P Shutdown - P System			8	166.99.224.88 166.99.224.171	00:20:85:	Network Managem	Computer Eric Office	Compute Eric	Select all
- 📋 Log Stuser List			8 8 8	166.99.224.43 166.99.224.185 166.99.224.155	00:20:85:	ConnectUPS Web/ Power Xpert Gate Network Managem	Bureau eric Your Loc	eric Your Na Compute	Set as power source
			0						

3.1.3 Shutdown

3.1.3.1 Introduction

Intelligent Power[®] Protector provides **local computer graceful shutdown** with an acquisition through:

- USB/Serial
- or Network (Web/SNMP Cards)

To configure shutdown, proceed as follows:

- Login with an administrator user profile
- From the Settings menu Item, select the 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.

3.1.3.2 Power source

To configure Power Source, perform the following actions:

• Click on Edit Power Source.

Edit power source			
Source			
Power source:	166.99.224.131		
Shutoff			
Load segment:	Load segment #1		
Access parameters			
Login:	admin		
Password:			
Save Cancel			

- 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.

3.1.3.3 Edit Shutdown Configuration

To configure Shutdown parameters, perform the following actions:

• Click on Edit shutdown configuration.

Edit shutdown configuration				
	Shutdown			
	Shutdown timer (second(s)):	None		
	Shutdown duration (second(s)):	120		
	Shutdown type:	Hibernate 💌		
	Shutdown script:			
		Save Cancel		

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, 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 computer, this configuration is processory if you want the converted context on even on mains.

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 condition is reached.

- After the **Shutdown timer** (if configured).
- When <u>WEB / SNMP UPS CARD or UPS shutdown criteria is reached</u> (UPS / WEB / SNMP UPS CARD Decision according to many criteria see next figure)



3.1.3.4 Edit advanced Shutdown Criteria

Edit advanced Shutdown Criteria opens the "Edit advanced Shutdown Criteria" window:

Edit advanced shutdown criteria	×	
Shutdown criteria is reached		
Redundancy lost		
Protection lost		
🔲 UPS fault (internal fault or battery fault)		
UPS overload		
Output on bypass		
Communication failure		
Save Cancel		

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

3.1.3.5 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

Edit UPS configuration X				
Low battery alarm level (%):	20			
Battery level before restart (%):	0			
Load segment #1 restart delay (second(s)):	3			
Load segment #2 restart delay (second(s)):	6			
Audible alarm :	Enabled 💌			
Save Cancel				

3.1.3.6 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.

3.1.3.7 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.

3.1.4.1 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**.

E	dit shutdown configuration	×
	Shutdown	
	Shutdown timer (second(s)):	None
	Shutdown duration (second(s)):	120
	Shutdown type:	Hibernate 💌
	Shutdown script:	
		Save Cancel

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)



3.1.4.2 Architecture #2 (Network attached UPS Web SNMP Card)

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:

Network Management Card

UPS	Shutdown Parame	ters		Help
UPS Properties	Pulsar M 2200			Computer Room
UPS Control				
Weekly Schedule				
Shutdown Parameters			1	
	Output	On battery	System Shutdown	Restart
Logs and Notification		Shutdown		
Measurements	A	if Remaining 180 sec		
Event Log	•••	time under:	Shutdown duration : 120 sec	If Capacity 15 %
System Log	Master	if Capacity under: 20 %		6x66603.
Email Notification		after: 30 min		
Settings	6	Switch Off		Switch On
Network	Grount	after: 900 sec	Shutdown duration : 120 sec	after: 30 sec
System	Le roup r	if Capacity under: 75 %		
Notified Applications		out the off		0
Access Control	6	switch on		switch on
Time	Group2	atter: 1800 sec	Shutdown duration : 120 sec	after: 18 sec
Firmware Upload		if Capacity under: 68 %		
		Show advanced parameters		
	Save modified setting	s:	Save	

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



3.1.4.3 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)

\Rightarrow 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** \rightarrow **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

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

Create new action		×
Action active*:		
Action name*:		
Event criticalities*:		
Event categories*: 🥖	All events	
From view*:	All Views	~
From view*: Action type*:	All Views Select an action	~

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.

Edit action	×
Action active*:	V
Action name*:	Email on shutdown events
Event criticalities*:	V 🛇 V 🖲 V 🚱 V 🛇
Event categories*: 🥖	Alarms
From view*:	All Views
Action type*:	Email
Settings	
SMTP server*:	smtp.server.com
Login:	admin
Password:	•••••
Recipient*:	sysadmin@server.com
Sender:	Computer 2
Subject: 🥖	Intelligent Power Protector (IPP) Alarms
Message: 🥖	Alarm from {nodeName}: {Idate} - {message}
Digest*:	Every minute
[Save Cancel

For the "generic" fields at the top of the window, please refer to "create new action" section

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 ^① button to add a variable.

dit message	×				
Select a field in the list below to custom your action message:					
 object - Name of object which triggered the event. 					
value - Value of object which triggered the event.					
🕙 message - Message link to the event.					
odeName - Node name.					
OstName - 'Intelligent Power Protector' host name.					
😮 date - Date in 'yyyy-mm-dd HH:MM:ss' format.					
Idate - Date in local format.					
Message	_				
Alarm from {nodeName}: {Idate} - {message}					
Save					

Command (Execute script/program):

Edit action			×
Action active*:			
Action name*:		Execute	
Event criticalities*:		🛛 🖉 📄 🔮 🚽 🚱	
Event categories*:	Ø	All events	
From view*:		All Views	*
Action type*:		Command	*
Settings			
Command*:		c:\custom\stop_services.bat	
		Save Cancel	

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.

Edit action		×
Action active*:		
Action name*:	Notification to Systray	
Event criticalities*:	🛛 🕥 🔹 🖉 🔮 🔍 🔇	
Event categories*: 🥖	Alarms, Shutdown events	
Event categories*: 🥖 From view*:	Alarms, Shutdown events All Views	~
Event categories*: // From view*: Action type*:	Alarms, Shutdown events All Views Notification	*

The alarms are displayed on the local computer in an alarm box. This alarm box displays the last 10 alarms. It takes the focus when a new alarm occurs. From the event section you can view more than 10 alarms.

🛐 'Intelligent P	ower Protector' Notificatio	ons	<u> </u>
Name Power Source Battery capacity Battery run time		166.99.224.48 On utility 100 % 35 min 00 s	5
Messages 166.99.2 166.99.2	124.121 09/16/09-6:08:4 124.121 09/16/09-6:07:4	7 am. The UPS output is on 7 am. The UPS output is off	

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:


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

E.	The System Tray Icon correctly receives alarms from Intelligent Power [®] Protector (AC is
	present on the Power source)
	The System Tray Icon correctly receives alarms from Intelligent Power [®] Protector (The
	Power Source runs in battery mode)
	The System Tray Icon correctly receives alarms from Intelligent Power [®] Protector (A
•	Warning event occurred on Power Source)
	The System Tray Icon correctly receives alarms from Intelligent Power [®] Protector (A critical
	event occurred on Power Source)
\otimes	Communication with Power source has failed

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:

```
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

=> **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.

FAT•N	Intell	igent Power [®] Protector	• Logout 'a • Help	admin'
Views	« @	User list		🔗 Add user
Views Views Power Source Events Events List Events Calendar Settings Auto Discovery Actions System Log Log		Login: admin Profile: Admin Password: ********* Login: john Profile: User Password: *******		∰Edit user ∰Remove user
Coser List				

User Accounts window

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

F:T•N	Intell	igent Power [®] Protector	• Logout ' • Help	'admin'
Views	« @	System System About 'Eaton Intelligent Power Protector' Product version: 1.10 build 038 Server system name: Windows NT/5.01.02 Website link: http://download.mgeops.com/explore/eng/network/net_sol.htm Contact: Location: Language Settings Language: [en] English Scan settings Default SNMP community name: ****** Automatic scan: Enabled Automatic scan: Enabled Automatic Update Settings Interval: Every week Last Update: (no update done) Next Check Update: 06/16/10-9:03:00 am Modules Settings		Edit system informations Edit language Edit scan settings Edit update settings Check for updates Edit modules settings
		Shutdown controller: Disabled		

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 changes the default SNMP community name for discovery and enables/disables periodic scan of new nodes.



 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)

3.1.8 Shutdown Controller

3.1.8.1 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.

3.1.8.2 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.

Edit modules settings					
Shutdown controller					
Save Cancel					

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:

3.1.8.3 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.

FAT•N I	TAT Intelligent Power® Protector → Help									Q. Q.			
Views	« ©	Node I	.ist									٥	«
Uiews		Туре	Status	Name	Description	Class 🔺	Version	OS Type	Remainin.	. Shut	Shutdown	O	
Power Source			0	PC43-Dell	Intelligent Power Protector	Intelligent Power Protector / 1.10.037	1.10.037	Windows NT/6.01.00	42	2 min		Lo	
Events			Ø	PC22-Leno	Intelligent Power Protector	Intelligent Power Protector / 1.10.037	1.10.037	Windows NT/6.01.00	20	2 min		М	
Events List			Ø	PC23-Leno	Intelligent Power Protector	Intelligent Power Protector / 1.10.037	1.10.037	Windows NT/6.00.02	22	2 min		Lo	
Events Calendar Settings Auto Discovery Actions Shutdown									Es Sh Ot	timated rur utdown du f time	ntime to shutdo uration	wn 22 mi 2 min 5 min	in 05 s 00 s 05 s
💞 System 🔲 Log 🔏 User List													

Notified Applications View

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 v to Communication Lost v 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.

3.2 Intelligent Power[®] Protector - Unix Settings

During IPP – Unix installation process, you will be guided through the configuration of your power protection.

3.2.1 Select the type of installation

- Select if you want to directly communicate with your UPS or if you wish to connect to an IPP server.
- Enter the time needed for your operating system to shut-down.
- If you have chosen to communicate directly with your UPS, you can then choose to act as a protection proxy or stay in a standalone mode.

3.2.2 For direct communication configuration

• Select the communication type: serial or network

•

- For serial communication: enter the serial port name or let IPP scan serial ports and choose in a list.
- For network communication, let IPP scan for available UPS. Then choose your device and enter its login/password. If your device is not in the list try to scan for more UPS (using SNMP protocol). In this case:
 - enter the network addresses and SNMP community name to automatically detect SNMP agents on the network
 - Then, select the desired agent from the list
- Select UPS password: This administrative password is used to secure settings and commands sent to the UPS.by the "admin" user.

3.2.3 For Client configuration

- enter the network addresses to automatically detect IPP Servers on the network
- Then, select the desired IPP Server from the list

Finally, review your configuration. IPP will be started, and you will be able to supervise IPP.

4 Supervision

Note: This chapter does not apply to IPP for Unix. Please refer to chapter 4.5.

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 IPP>:4680/ or

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

In SSL mode, accept the certificate (by clicking on Yes)



Accepting the SSL Certificate

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 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.

Information and Status						
Ø 166.99	.224.121					
	Description Nominal apparent power IP address Mac Address Location Contact Link	Evolution 850 850 VA 166.99.224.121 00:06:23:00:20:28 Office Manager				
Battery state		🧭 Charging				
Power Source		🕜 On utility				
Load level		5 %				
Battery capaci	100 %					
Battery run tim	1 h 04 min 35 s					
Master output		🐨 On				
Group1		🐨 On				
Group2		记 On				

Information Panel

The following node information is displayed in this panel:

•	166.99.224.121 Description Nominal Apparent Power IP address Mac address Location	the DNS name (or IP address) is displayed near the "status icon" the commercial product name the UPS Nominal Apparent Power (in VA or KVA) (if network acquisition) the Web/SNMP card IP address (if network acquisition) the Web/SNMP card Mac address 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

-Input	
Input frequency	59 Hz
Input voltage	229 \
Input current	1 A
Bypass frequency	60 Hz
Bypass voltage	231 \
Bypass current	0 A
- Output	
Battery output voltage	202 \
Output frequency	60 Hz
Output voltage	231 \
Output current	1.4
Global apparent power	0 VA
Global active nower	0 VA

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

4.2.3 Environment

Environment		-
Temperature		22.9 °C
Humidity		18.2 %
Input #1	Ø	Open
Input #2	Ø	Open

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 of
 - 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 *w* button allows you to select the data you want to display in the graph (refer to following screenshot)

C	Graph Settings			5
Γ	Measures			
	Battery:	📝 Battery capacity	🗹 Battery run time	
		🔲 Battery output voltage	Battery temperature	
	Output:	🔲 Output voltage	🔲 Output current	
		🔲 Output frequency	🔽 Load level	
		Apparent power		
	Input:	📝 Input voltage	🗹 Input current	
		🔲 Input frequency		
	Environment:	🗷 Temperature	🔲 Humidity	
	Time Scale			
	2 hours		~	•
		Save	Cancel	
		24/6		

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 tool tip is displayed when the mouse is over one of the functional block.

Synoptic Color codes:UPS modules:

AC/DC	DC/AC	By-Pass	Color	Description
$\sim \sim$	_ ~	-7*	Green	Status OK & Active
~_	=/~	-0*	Red	Internal fault & Inactive
~_	=/~	-7*	Grey	Status OK & Inactive or Unknown

Battery module: ٠

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: ٠

Symbol	Color	Description
	Green	Source powered. Status OK
\land	Grey	Source not powered or status unknown

	Example	s of combinations between flow status and power source status:
	Green/	The electrical power source is powered and provides electrical flow
and the second s	Yellow	
	Green/	The electrical power source is powered and does not provide electrical flow
	Grey	

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

Symbol	Color	Description
	Green	Load powered and protected. Status OK
	Red	Load not powered
\land	Grey	Load status unknown

	Examples	of combinations between flow status and load status:
	Yellow/	Load powered and protected
	Green	
	Grey/	Load not powered
- Carrow	Red	

4.2.6 Events

Events			# -
Status	Date	Message	
Ø	27/01/09-15:59:22	Bypass : Return on UPS	
•	27/01/09-15:58:45	Output on automatic bypass	
Ø	27/01/09-15:58:43	The outlet group 2 is on	
Ø	27/01/09-15:58:42	The outlet group 1 is on	
Ø	27/01/09-15:58:40	The UPS output is on	
0	27/01/09-15:58:32	The UPS output is off	

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

Statistics - 7 days	
Communication between card and device lost	4
The UPS output is off	4
Network communication with device lost	3
Estimated consumption	27.54 kVA.h
Power lost count	3
Cumulated power lost time	6 min 42 s
UPS fault	3
UPS overload	1
02/17/09 - 12:00:00 am 🥨	02/23/09 - 11:59:59 pm

This panel displays the statistics of the selected node.

The *w* 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:

FAT•N	Intell	igen	nt Powei	r® Prote	ctor	• Logout • Help	'admin'
Views	 <th>Events</th><th>s List</th><th></th><th></th><th></th><th>Acknowledge selected events</th>	Events	s List				Acknowledge selected events
Views General Views General Views General Views General Views		Status	Date 05/31/10-8:05	Name 166.99.224.43	Message End of UPS shutdown imminent alarm	Ack	Acknowledge all events
Events List		0	05/28/10-6:11	166.99.224.43 166.99.224.43	The load segment #1 is off The load segment #2 is off		Export logs
Settings		0	05/28/10-6:11	166.99.224.43	The UPS output is off	V	Select all
- Ctions - Shutdown - System - Log - Syster List		•	05/28/10-6:11	166.99.224.43	UPS shutdown imminent alarm		

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 PowerSource -> Event panel

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

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

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.

F:T•N	Intell	igent	Powe	r® Pro	tecto	r⊸)						•1	.ogout 'admin Help			Q. Q.
Views	۵ »	Events Ca	lendar							۲	Selection	on view				»
🗆 😋 Views		Week 🕶	Sunday	Monday	Tuesday	Wednesd	Thursday	Friday	Saturday		Events -	2 events - fror	n 06/02/10 to 0	6/03/10	۲	
Power Source		23 (06/20		: 🕲							Status	Date	Name	Message	Ack	
Events	113	22 (06/20				•	•	•			Ø	06/03/10-3:	PC43-Dell-S	. Communication with d		*
Events List						8	8	8			Ø	06/03/10-3:	PC23-Leno	. Communication with d		
Events Calendar											Ø	06/03/10-3:	PC22-Leno	. Communication with d		
Auto Discovery											Ø	06/03/10-3:	AV4K18007	The load segment #2 i		_
Actions											0	06/03/10-3:	AV4K18007	The load segment #1 i		=
- P Shutdown											0	06/03/10-3:	AV4K18007	The UPS output is on		
System											0	06/03/10-3:	AV4K18007	The system is power		
Ser List											0	06/03/10-3:	AV4K18007	The load segment #2 i		
											0	06/03/10-3:	AV4K18007	The load segment #1 i		
											0	06/03/10-3:	AV4K18007	The UPS output is off		Ξ
											8	06/03/10-3:	PC22-Leno	. Communication with d		
											8	06/03/10-3:	PC23-Leno	. Communication with d		
											8	06/03/10-3:	PC43-Dell-S.	. Communication with d		
												06/03/10-3 Page 1 of	AV4K18007	The system is nower	ndagieg 1-:	₹ 25
											Statistics	s - 2 days - fror	n 06/02/10 to 0	6/03/10		
											Estimate	d consumption			8.21 kVA	A.h
											Averag	e apparent pow	/er		222 \	VA 10
											Cumulat	ed power lost t	time	2	h 09 min 20	D S
											The UPS	S output is off				5
											Commu	nication lost				28

4.3.3 Nodes Events list

The icons in the different views represent the event severity.

lcon	Event status						
0	Normal. With this event, the UPS device is coming back to a normal status.						
	Event list (UPSs):						
	 Communication with device is restored 						
	 Communication restored with UPS 						
	 The system is powered by the utility 						
	The UPS output is on						
	 Communication restored with UPS 						
	 Battery OK 						
	 UPS returns to normal load 						
	 UPS OK 						
	 Bypass : Return on UPS 						
	 End of low battery alarm 						
	 The outlet group 1 is on 						
	 The outlet group 2 is on 						
	 Communication failure with environment sensor 						
	 Communication restored with environment sensor 						
	 Humidity is in normal range 						
	 Temperature is in normal range 						
	 Input #x on 						
	Input #x off						
	 End of warning alarm 						
	 End of critical alarm 						
	 Redundancy restored 						
	Protection restored						



Warning. A problem occurred on the 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)



A

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 ^(b) (http access) or this yellow one ^(b) (https access).

Powering Business Worldwide		Network Management Card		Power Xpert®	FAT-N	ateway time: 2/30/2010 15:05:30 UTC 2/30/2010 16:05:30 CET //	
UPS UPS Properties UPS Control Vesely Schobile Shuddown Plaameters Logs and Notification Messurements Event Log	UPS Properties	AC Output Vitage 22 Current 6.0 Addeement Addeement Addeement So	Help 1 V 2 A 12 15 15 15 15 15 15 15 15 15 15	PoertVert Gatery Card - Poertvert 5125 Lost Segment 1 Lost Segment 2 Lost Segment 3 - Name Generic Jama - Loge - Loge - Data	Powerware 5125 Select a parameter category: A Identification Identification Identification Batter Last Replaced Date.	Enable 30 second extorebields	
System Log Email Notification Settings Network	UPS Status Power source : Output load level :	AC Power		Event System - Configuration Access Control Network	Date Last Serviced: Installation Date: Low Runtime Alarm Setpoint: Nominal Input Frequency:	Not Set Not Set 3 minutes 50 hertz	
 System Notifed Applications Access Control Time 	Output :	Master: On Group1: On Group2: On		Date/Time Ernai General Ernail Collective Ernail Moditus TCP SNMP	Naminal Input Voltage: Naminal Output Frequency: Naminal Output Voltage: Number of Phases:	230 volts 50 hertz 230 volts 1	
Firmware Upload Environment	Battery Battery load level :	100% Charging		UPS NetWatch Test and Control Scheduled Shutdown	Output VA Rating: Output Watts Rating:	3000 volt-amperes 2700 watts	
0 Status 0 Settings	Remaining backup time : Battery status :	5 h 02 mn 43 s OK		Save and Restore Eirmware Logon as User	Part Number: + Identification/System Config	05147155-5691 guration	

Opening different Web interfaces from Intelligent Power[®] Protector.

4.5 IPP – Unix status interface

To view the current state of the UPS that powers the server running Intelligent Power[®] Protector, use the following command, from a terminal (if ipp-status is not found, try to open a new terminal):

\$ ipp-status

A status text screen will be displaying, providing essential information on the power protection:



The script offers several switches that may be useful for further scripting (easy extraction of the provided information).

The full usage information is obtained via the -h switch:

\$ ipp-status --h

```
$ ipp-status -h
Usage: ipss-status [OPTIONS]
OPTIONS:
                       Print this help and exit
    - h
    - S
                       Don't show overall status
                       Show overall status in short form of "(un)protected"
                       Do not print anything; instead, exit with 0/non-0
    - q
                       if the system is/isn't protected, respectively
    - D
                       Don't show devices status
    - d
                       Show devices report in scripting-friendly form
Full devices status report consists of the device ID, its status
(as readable meaningful string) and on-battery runtime in form [[H:]MM:]SS.
In the short form (for scripting), the runtime is shown in seconds
and the fields are separated by colon.
$
```

For example, the following invocation provides easily parsed device info :

\$ ipp-status –Sd

\$ ipp-status -Sd
UPS1:online:23917
UPS2:online:3681
\$

5 Redundancy

Note: This chapter does not apply to IPP for Unix. Please refer to chapter 5.7.

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).

Edit modules settings
Redundancy
Shutdown controller
Save Cancel

Here are illustrated the electrical redundancy topologies:

• Redundant Supplies



• Hot Standby



- UPS 1
 STS

 UPS 2
 STS 1

 UPS 1
 STS 1

 UPS 2
 STS 1
- Static Transfer Switch for two components

• Parallel for two or more components



5.2 Redundancy configuration

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

F:T•N Intell	igen	t Po	wer® Prote	ctor			• Logout • Help 🔮	'admin'
Views 🔍 🔕	Node Li	ist						Requick scan
i 🔁 Views	Туре	Status	Name	Mac Address	Class	Location	Contact	hange scan
Componente		Ø		00:22:19:FF:8E:5E	DELL Network Mana			🔎 Address(es) scan
Events		Ø	410.30	00:22:19:FF:8E:72	Network Managemen	Computer Room	Computer Room Man	
Events List		Ø	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	00:20:85:FD:76:08	Network Managemen	Computer Room	Computer Room Man	Set node access parameters
Events Calendar		Ø	(Investigation	00:20:85:FD:F6:2C	Network Managemen	Computer Room	Computer Room Man	CEdit node information
Auto Discovery		Ø		00:22:19:FF:8E:79	DELL Network Mana	Computer Room	Computer Room Man	Remove nodes
Actions		Ø	1000 MILEN		ConnectUPS Web/SN			
- @ Shutdown - @ System		Ø			ConnectUPS Web/SN	IE LAB 9130 DUBAI c	Jerome Veyrier	Select all Deselect all
Log	3	0	1.11	00:20:85:FB:56:1E	Network Managemen	Computer Room	Computer Room Man	
🖓 User List		0	1 · · · ·	00:06:23:00:1E:7F	Network Managemen	Eric Office	Eric	PSet as power source
								Set composite device

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.

F:T•N Intell	igen	nt Po	wer®	Prote	ctor					• Logout • Help 🔮	'admin'
Views 🔍 💿	Node L	.ist									Real Quick scan
Views Gever Source Gever Components	Type	Status	Name	-	Mac Address 00:22:19:FF:8E	:5E	Class DELL Network Mana	Location	Corr	tact	Arange scan
Events		0		Set comp	00:22:19:FF:8E 00:20:85:FD:76 posite device	:08	Network Managemen	Computer Room	Com	puter Room Man puter Room Man uter Room Man	Set node access parameters
Auto Discovery Auto Discovery Shutdown Shutdown System Dog User List		© © © ©	ور ارا ۱۹ ۱۹ ۱۹ ۱۹ ۱۹ ۱۹ ۱۹ ۱۹	Device n Redunda Redunda	name: ancy mode: ancy level:	My_re Redur 1	edundant_System ndant Supplies 5ave Cancel]	~	uter Room Man ne Veyrier uter Room Man	

- 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.

F:T•N	Intell	igent Power® Protector			• Log • Helj	out'admin' p 📽
Views	« @	Power Source				
∃ 🔄 Views ∃ 🤮 Power Source		Information and Status		Events		
Geover Source Geover		My_redundant_System Description Cass Redundancy mode Redundancy level Protected source count Redundant source count Battery state Power Source Load level	Virtual Power Source Virtual Power Source Driver Redundant Supplies 1 2 1 © Charging © On utility 3 %	Status © © ©	Date 09/09/11-9:52:57 am 09/09/11-9:52:39 am 09/09/11-9:52:39 am 09/09/11-9:52:39 am	Message Communication failure with environ Communication restored with envir Sensor contact 'Input #1': off Sensor contact 'Input #2': off
		Master output Load segment #1 Load segment #2 Power Components Type Stat Name Load level	Battery capacity Battery run % 100 % 1 h 15 min 5 % 100 % 40 min 25 s	Statistics -	7 days	

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.

FAT-N Intell	igent Power® I	Protecto	r			:	Logout 'admin' Help 🖌
Views 🔍 🚳	Node List				۲	Selection view	»
🖃 😋 Views	Type Stat Name	Description	Location	Contact	Link	Information	-
Power Source	💽 🖉 - 1947 - 17	Evolution 850	Computer Room	Computer Room.			
- La Power Components		Evolution 650	Eric Office	Eric		🕑 - S. S. Markeland	
Events List Events Calendar Settings Auto Discovery Ations Shutdown System Loo					U	Description Nominal apparent power P address Mac Address Gass Location Contect Link	Evolution 850 850 VA 165 99 224 100 00 22 86 SFP5 51 E AV2470700 Network Management Card / HB Computer Room Computer Room
Ser List						Status	Θ
						Bettery state Power Source Load level Bettery capacity Bettery run time Master output Master Load segment #1: Group1 Load segment #2: Group2 Measures Insut	Charging Concellity Co
	Mid Own Tott	20 25	there are and	Direlaving	I - 2 of 2	Dirthout Dirthout	49 Hz 232 V 49 Hz 233 V 0 A 21 VA 0 W

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

 \Rightarrow This is the default IPP configuration.

The next screenshot illustrates this IPP default configuration available from Settings -> Shutdown - > Edit Shutdown Configuration.

Edit shutdown configuration	×
Shutdown timer (second(s)):	None
Shutdown duration (second(s)):	120
Shutdown type:	Hibernate 💌
Shutdown script:	
	Save Cancel

⇒ 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:

UPS	Shutdown Param	eters		Help
UPS Properties UPS Control Weekly Schedule	Pulsar M 2200			Computer Room
Shutdown Parameters	Output	On hattery	Svetem Shutdown	Postart
Logs and Hotification Measurements Event Log System Log Email Notification	6 Master	Shutdown if Remaining 180 sec time under: 20 % after: 30 min	Shutdown duration : 120 sec	If Capacity 15 %
Settings Network System	© Group1	Switch Off after: 900 sec if Capacity under: 75 %	Shutdown duration : 120 sec	Switch On after: 30 sec
 Notified Applications Access Control Time Firmware Upload 	Group2	Switch Off after: 1800 sec if Capacity under: 68	Shutdown duration : 120 sec	Switch On after: 18 sec
	Save modified settin	Show advanced parameters	Save	

Network Management Card

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...)

 \Rightarrow 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.

E	dit shutdown configuration		×
	Shutdown		
	Shutdown timer (second(s)):	600	
	Shutdown duration (second(s)):	120	
	Shutdown type:	Hibernate 💙	
	Shutdown script:		
			-
		Save Cancel	ר

⇒ 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

Powering Business Worldwide		Netwo	ork Management Card	
JPS	Shutdown Parameters			
UPS Properties UPS Control Weekly Schedule	Evolution 850			
	Output	On battery	System Shutdown	Restart
Logs and Notification Measurements Event Log System Log Email Notification	Master	Shutdown if Remaining time under: 180 sec if Capacity under: 20 % ✓ after: 10 min	Shutdown duration : 120 sec	If Capacity exceeds: 0 %
Settings Network System	Group1	Switch Off after: 65535 sec if Capacity under: 0 %	Shutdown duration : 120 sec	Switch On after: 30 sec
Notified Applications Access Control SNMP Time Eignware Unload	Group2	Switch Off after: 65535 sec if Capacity under: 0 %	Shutdown duration : 120 sec	Switch On after: 30 sec
 Finitivare opodů 	Save modified settings :	Show advanced parameters	Save	

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...)

- \Rightarrow 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.

Edit shutdown configuration					
- Shutdown					
Shutdown timer (second(s)):	None				
Shutdown duration (second(s)):	600				
Shutdown type:	Hibernate 💌				
Shutdown script:					
	Save Cancel				

⇒ 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

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 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

Load / Failures	Load < 20 KW	20 KW < Load < 40 KW	40 KW < Load < 60 KW	60 KW < Load < 80 KW
No failure.	P=4; R=3	P=4; R=2	P=4; R=1	P=4; R=0
1 failure.	P=3; R=2	P=3; R=1	P=3; R=0	P=3; R=0 → Protection Lost active
2 failures.	P=2; R=1	P=2; R=0	P=2; R=0 → Protection Lost active	P=2; R=0 → Protection Lost active
3 failures.	P=1; R=0	P=1; R=0 → Protection Lost active	P=1; R=0 → Protection Lost active	P=1; R=0 → Protection Lost active
4 failures.	P=0; R=0 \rightarrow Protection Lost active	P=0; R=0 → Protection Lost active	P=0; R=0 → Protection Lost active	P=0; R=0 \rightarrow Protection Lost active

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

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

UPS Compatibility List for Redundancy on 1-phase UPSs

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

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

5.7 IPP – Unix and redundancy

When IPP is directly connected to UPS (either via network or serial connection), you may configure it with several UPS. Whenever you set-up more than one UPS, IPP will ask you to give the number of power supplies that must be receiving power to keep your system running.

This is useful in case you have a server with redundant power supplies which allow it to run with only one of the power supply available. In this case you can set the number of power supply needed to less than the number of UPS configured.

Advanced Management 6

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 <u>http://powerquality.eaton.com</u>)

7 Compatibility List

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

7.1 Eaton Serial line Devices

Eaton Equipment designation	Connectivity
Eaton Powerware series:	USB or RS232
3105, 5110, 5115, 5130, 9130, 9135, 9140 and legacy 9120, 9125	
Eaton Powerware series:	RS232 only
BladeUPS, 5125, 9155, 9355, 9390, 9395	
Eaton Pulsar Series:	USB or RS232
Eaton 5PX	
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	
Pulsar MX & Pulsar MX Frame 16 U / MX	
Eaton Pulsar Series:	RS232 only
EX RT	
Comet EX RT 1:1 / 3:1 / EX 5 RT (Asia/Pacific)	

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

Eaton equipment designation	Туре	Illustration
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-MS MiniSlot Network Management Card Network-MS (ex 103006826) And associated Environment Sensor	UPS Option Card Eaton Powerware	
ConnectUPS-BD Web /SNMP P/N 116750222-001 (**) And associated Environment Sensor	UPS Option Card Eaton Powerware	
ConnectUPS-XSlot Web /SNMP/xHubCard, P/N 116750221- 001 (*) (**) And associated Environment Sensor	UPS Option Card Eaton Powerware	
PXGX-UPS Card	UPS Option Card Eaton	

PXGX2000 P/N 103005868-5591 (*) (***)	UPS Option Card Eaton Powerware	
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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.

Eaton equipment designation	Туре	Illustration
MGE Network Management Card MiniSlot SNMP/Web – 66244 And associated Environment Sensor	UPS Option Card (legacy)	
Network Management Card Transverse SNMP/Web – 66074 And associated Environment Sensor	UPS Option Card (Legacy)	

7.4 Network Ports

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

Mode/Port	Netwo rk MS/ NMC	PXGX2000, PXGX-UPS, ConnectUPS BD, ConnectUPS XSlot	IPP with Shutdown controller	IPP	IPM
TCP/25	OUT	OUT	OUT	OUT	OUT
UDP/67	OUT	OUT	х	х	х
UDP/69	IN	Х	OUT	OUT	OUT
TCP/80	IN	IN	OUT	OUT	OUT
UDP/123	OUT	OUT	х	х	х
UDP/161	IN	IN	OUT	OUT	OUT
UDP/162	OUT	OUT	x	x	x IN/OU
UDP/200	х	OUT	IN/OUT	IN/OUT	Т
TCP/443	IN	IN	OUT	OUT	OUT IN/OU
TCP/4679	x IN/OU	x	IN/OUT	IN/OUT	T IN/OU
UDP/4679	T	x	IN/OUT	IN/OUT	T IN/OU
TCP/4680	х	х	IN/OUT	IN/OUT	T
UDP/4680	OUT	х	IN	IN	IN
TCP/5000	IN	Х	OUT	OUT	OUT
TCP/5001	х	х	IN	OUT	OUT
	Mode/Port TCP/25 UDP/67 UDP/69 TCP/80 UDP/123 UDP/161 UDP/162 UDP/200 TCP/443 TCP/4679 UDP/4679 TCP/4680 UDP/4680 TCP/5000 TCP/5001	Netwo rk MS/ NMC TCP/25 OUT UDP/67 OUT UDP/69 IN TCP/80 IN UDP/123 OUT UDP/161 IN UDP/162 OUT UDP/163 IN UDP/164 IN UDP/200 X TCP/46379 X IN/OU T TCP/4630 X UDP/4630 IN TCP/5000 IN TCP/5000 X	Netwo rk MS/ NMC PXGX-UPS, ConnectUPS BD, ConnectUPS XSlot TCP/25 OUT OUT UDP/67 OUT OUT UDP/69 IN x TCP/80 IN IN UDP/123 OUT OUT UDP/161 IN IN UDP/162 OUT OUT UDP/163 IN IN UDP/164 IN IN UDP/165 OUT OUT UDP/162 OUT OUT UDP/163 IN IN UDP/200 X OUT TCP/4679 X X TCP/4679 X X UDP/4679 T X TCP/4680 X X UDP/4680 OUT X UDP/4680 OUT X TCP/5000 IN X TCP/5001 X X	PXGX2000, PXGX-UPS, rk MS/ TCP/25IPP with Shutdown controllerTCP/25OUTOUTOUTUDP/67OUTOUTXUDP/69INXOUTTCP/25OUTOUTXUDP/67OUTOUTXUDP/69INXOUTUDP/123OUTOUTXUDP/161ININOUTUDP/162OUTOUTXUDP/163ININOUTUDP/164ININOUTUDP/165XOUTXUDP/200XOUTOUTTCP/4679XXIN/OUTIN/OUTTXIN/OUTUDP/4679TXIN/OUTTCP/4680XXIN/OUTUDP/4680OUTXINTCP/5000INXOUTTCP/5001XXIN	PXGX2000, PXGX-UPS, ConnectUPS BD, ConnectUPS XSlotIPP with Shutdown controllerIPPTCP/25OUTOUTOUTOUTUDP/67OUTOUTXXUDP/69INXOUTOUTTCP/80ININOUTOUTUDP/123OUTOUTXXUDP/161ININOUTOUTUDP/162OUTOUTXXUDP/200XOUTOUTXTCP/4679XAXIN/OUTOUTUDP/4679TXXIN/OUTTCP/4680XXXIN/OUTTCP/4680XXXIN/OUTTCP/5000INXOUTINTCP/5001XXININTCP/5001XXINOUT

8 FAQ and Error messages

In the 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 IPP>:4680/

or

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

In Ubuntu's Software Center:

Message "The package is of bad quality"

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

In the Linux Graphical System integration:

Linux (Debian and Ubuntu, with Gnome)

Eaton-Intelligent Power Manager - "Open" shortcut is not present

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

Linux (OpenSuSe 11, with KDE)

Eaton-Intelligent Power Manager - "Open" shortcut is not visible

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

Linux (Red Hat, OpenSuSe and Mandriva)

Notification icon ("system tray icon") is not started upon installation or upgrade

Solution 1:

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

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

Note that if you launch this command from a terminal, you will need to add an ampersand (" &") at the end of the command line, in order to detach the process.

Solution 2:

Close your graphical session, and log into a new one.

The notification icon will be automatically started with the new graphical session.

Linux (Unity desktop)

Eaton-Intelligent Power Manager - "Open" shortcut is not present Solution: 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 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: { 'proxyHost': "your.proxy.address.com", 'proxyPort': "proxy_port" For example: { '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.

When connected through Serial RS232, sometimes Pulsar UPSs don't shutoff as expected. In this case the UPS does not take into account "Shutdown Duration" parameter of Intelligent Power Protector.

Solution:

Use USB connection. Next IPP version will implement this correction in RS232.

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 (<u>http://www.openssl.org/</u>)
- This IPP product includes cryptographic software written by Eric Young (eav@cryptsoft.com)
- This IPP product includes software written by Tim Hudson (tih@cryptsoft.com)

Lib USB

Net SNMP

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