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1 Introduction

The Eaton IT supervision tool is called "Intelligent Power[®] Manager"

Intelligent Power[®] Manager:

- Discovers and **supervises Eaton UPSs and ePDUs** connected to the network (either by means of a card or a proxy). For the detailed list of compatible solutions, please refer to the paragraph (Equipment Compatibility List) hereafter.
- **Supervises the remote servers** hosting the Network Shutdown Module V3 application.
- Provides **advanced management feature** (mass configuration / mass upload/ ...) with Network Management cards (66102, 66103, 103006826)
- Provides **local computer graceful shutdown** (acquisition through 66102, 66103, 103006826 Network Management Cards).

2 Installation

2.1 Installation Prerequisites

2.1.1 On the System Hosting « Intelligent Power® Manager »

Intelligent Power® Manager can be installed on **Windows 2000/XP (Home or Pro) / 2003 / Vista / 2008**

Intelligent Power® Manager has been tested successfully on a **Windows 7 Beta**

Notes:

To avoid network access conflicts, we advise you against installing the Power Manager on a machine that also hosts:

- a Network Management System (e.g. HP-Openview, CA Unicenter, ...)
- the Eaton Enterprise Power Manager
- the Eaton Network Shutdown Module
- the Network Management Proxy

2.1.2 On the System that Displays Web-based Graphical User Interface

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

The Intelligent Power® Manager graphical interface has been tested with:

- Google Chrome
- Mozilla Firefox 2.0, 3.0, 3.5
- Microsoft Internet Explorer V6 & 7, 8.

For optimal performance, Google Chrome or Firefox 3.5 is recommended.

For good performance, Firefox 3.0 or Internet Explorer 7, 8 are recommended.

2.2 Quick Start & Installation

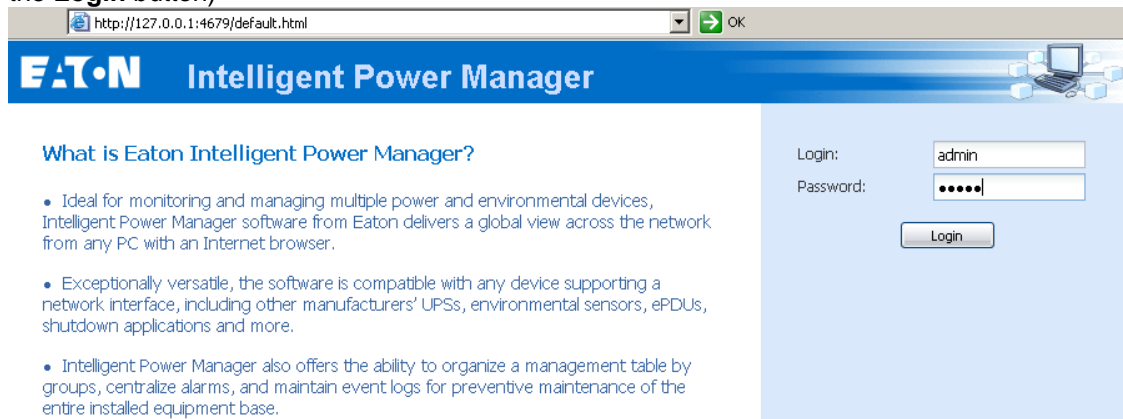
To start in 5 minutes, please perform the following steps:

Step 1 (Installation)

On a Windows 2000/XP/2003/Vista/2008 machine, run the “Intelligent Power® Manager” package under an administrator account.



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



Step 2 (Configuration)

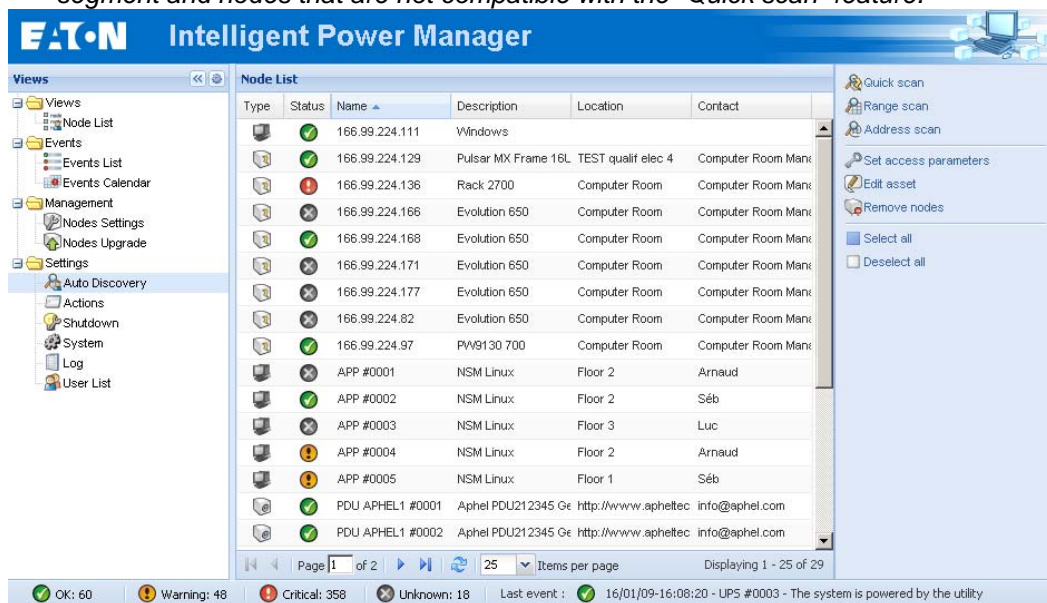
When started, the application automatically performs a **Quick scan**.

- Using the Quick scan operation, you will discover through broadcast within a few seconds: Network Management Cards 66102, 66103, PXGX2000, ConnectUPS BD, ConnectUPS X, ConnectUPS MS and Network Shutdown Module V3.

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 and nodes that are not compatible with the "Quick scan" feature.



(optional) In the **Settings → Shutdown** page, assign the IP address of the UPS that powers the local Computer.

In the **Settings → User List** page, assign the access rights through "login and password"

Step 3 (Enter the License code)

(optional for the free version) In the **Settings → System → Edit system Information**, enter the license product key that is printed on the commercial CDs booklet:

=> ref 66925 Intelligent Power® Manager Silver License (11 to 100 device nodes)

=> ref 66926 Intelligent Power® Manager Gold License (101 to Unlimited device nodes)

The nodes that are not managed due to license limitation will appear with this icon .

Step 4 (Operation)

The **Views → Node List** menu item allows you to supervise the current state of the compatible power devices & applications (select a line in the list and the panels are updated with selected device information)

Type	Status	Name	Description	Location	Contact	Link
UPS	!	UPS #0001	Evolution 2200	Floor 1	Arnaud	
UPS	!	UPS #0002	Pulsar 1000 RT2U	Floor 2	Séb	
UPS	!	UPS #0003	Evolution 500	Floor 2	Luc	
UPS	!	UPS #0004	Evolution 500	Floor 1	Luc	
UPS	!	UPS #0005	Pulsar Extreme 3200C	Floor 2	Séb	
APP	!	APP #0001	NSM Linux	Floor 2	Arnaud	
APP	!	APP #0002	NSM Linux	Floor 2	Séb	
APP	!	APP #0003	NSM Linux	Floor 3	Luc	
APP	!	APP #0004	NSM Linux	Floor 2	Arnaud	
APP	!	APP #0005	NSM Linux	Floor 1	Séb	
PDU	✓	PDU APHEL1 #0001	Aphel PDU212345 Ge	http://www.apheltech	info@aphel.com	
PDU	✓	PDU APHEL1 #0002	Aphel PDU212345 Ge	http://www.apheltech	info@aphel.com	
PDU	✓	PDU APHEL2 #0001	DBQ10634/5 my_devi	Floor 3	Yoann	
PDU	✓	PDU APHEL2 #0002	DBQ10634/5 my_devi	Floor 1	Luc	
PDU	✓	PDU PULIZZ1 #0001	Powerware ePDU			
PDU	✓	PDU PULIZZ1_TRI #001	Powerware ePDU			
PDU	✓	PDU PULIZZ12 #0001	Switched ePDU	Floor 2	Yoann	
PDU	✓	PDU PULIZZ12 #0002	Switched ePDU	Floor 1	Yoann	
PDU	✓	PDU MGE #0001	SwitchedPDU_81009	Floor 3	Yoann	
PDU	✓	PDU MGE #0002	SwitchedPDU_81009	Floor 2	Eric	
166.99.224.166	!	Evolution 650	Computer Room	Computer Room M		
166.99.224.168	!	Evolution 650	Computer Room	Computer Room M		
166.99.224.111	!	Windows				
166.99.224.136	!	Rack 2700	Computer Room	Computer Room Mana		
166.99.224.97	!	PV9130 700	Computer Room	Computer Room Mana		

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

The **Events → Event List** view allows you to view the device events.

2.3 Installation Result

- If you install a new Intelligent Power® Manager version without uninstalling the old one you will keep your database and your product information.
- At the end of the installation, the following shortcuts are created in the group:
Start → Programs → Eaton → Intelligent Power Manager

Name	Description
Open Eaton Intelligent Power Manager	Starts the main "Intelligent Power® Manager" graphical interface
Start Eaton Intelligent Power Manager	Starts the service
Stop Eaton Intelligent Power Manager	Stops the service
Uninstall Eaton Intelligent Power Manager	Uninstalls the Program

- A service called « Eaton intelligent Power Manager » is also created for the Database Acquisition Engine.
This program continuously polls the status of Eaton devices and Applications connected on the network.
This service automatically starts on machine boot-up.
This service provides the Web Interface.
- A systray displays the alarms on the local computer.

2.4 Uninstalling the Product

- From the **Add/Remove** programs item of the control panel, execute the "Eaton Intelligent Power Manager Vx.xx" package.
- You can also uninstall from the shortcuts:
Start → Programs → Eaton → Intelligent Power Manager → Uninstall Eaton Intelligent Power Manager
This will remove the database and the custom files if you confirm it.

2.5 Upgrading the Product

Please refer to the Checking for Upgrades Paragraph.

3 Configuration

3.1 Configure the Nodes



Each node (Network Management Card / Proxy / Application) 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® Manager" automatically receives the alarms (through notification or polling) without specific configuration on the card, proxies, Applications.



For SNMP acquisition, check the community name. Default community name is configured in Settings → System → Default Community Name

A specific community name can be defined for each IP range in Settings → Auto Discovery → Range Scan → Password

3.2 Intelligent Power® Manager Settings

Start the "Intelligent Power® Manager" main graphical interface from the previously created shortcut, and then click on the **Settings** menu item.

3.2.1 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:

- 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: Network Management Cards 66102, 66103, PXGX2000, ConnectUPS BD, ConnectUPS X, ConnectUPS MS and Network Shutdown Module V3.
- 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 and nodes that are not compatible with the "Quick scan" feature.
- Address Scan performs a single address scan

Eaton Intelligent Power Manager

Views

- Views
 - Node List
- Events
 - Events List
 - Events Calendar
- Management
 - Nodes Settings
 - Nodes Upgrade
- Settings
 - Auto Discovery
 - Actions
 - Shutdown
 - System
 - Log
 - User List

Node List

Type	Status	Name	Description	Location	Contact
Computer	OK	166.99.224.111	Windows		
Computer	OK	166.99.224.129	Pulsar MX Frame 16L TEST qualif elec 4		Computer Room Man
Computer	Warning	166.99.224.136	Rack 2700	Computer Room	Computer Room Man
Computer	Warning	166.99.224.166	Evolution 650	Computer Room	Computer Room Man
Computer	OK	166.99.224.168	Evolution 650	Computer Room	Computer Room Man
Computer	Warning	166.99.224.171	Evolution 650	Computer Room	Computer Room Man
Computer	Warning	166.99.224.177	Evolution 650	Computer Room	Computer Room Man
Computer	Warning	166.99.224.82	Evolution 650	Computer Room	Computer Room Man
Computer	OK	166.99.224.97	PW9130 700	Computer Room	Computer Room Man
Computer	Warning	APP #0001	NSM Linux	Floor 2	Arnaud
Computer	OK	APP #0002	NSM Linux	Floor 2	Séb
Computer	Warning	APP #0003	NSM Linux	Floor 3	Luc
Computer	Warning	APP #0004	NSM Linux	Floor 2	Arnaud
Computer	Warning	APP #0005	NSM Linux	Floor 1	Séb
PDU	OK	PDU APHEL1 #0001	Aphel PDU212345 Ge	http://www.apheltec	info@aphel.com
PDU	OK	PDU APHEL1 #0002	Aphel PDU212345 Ge	http://www.apheltec	info@aphel.com

Page 1 of 2 25 Items per page Displaying 1 - 25 of 29

Quick scan
Range scan
Address scan
Set access parameters
Edit asset
Remove nodes
Select all
Deselect all

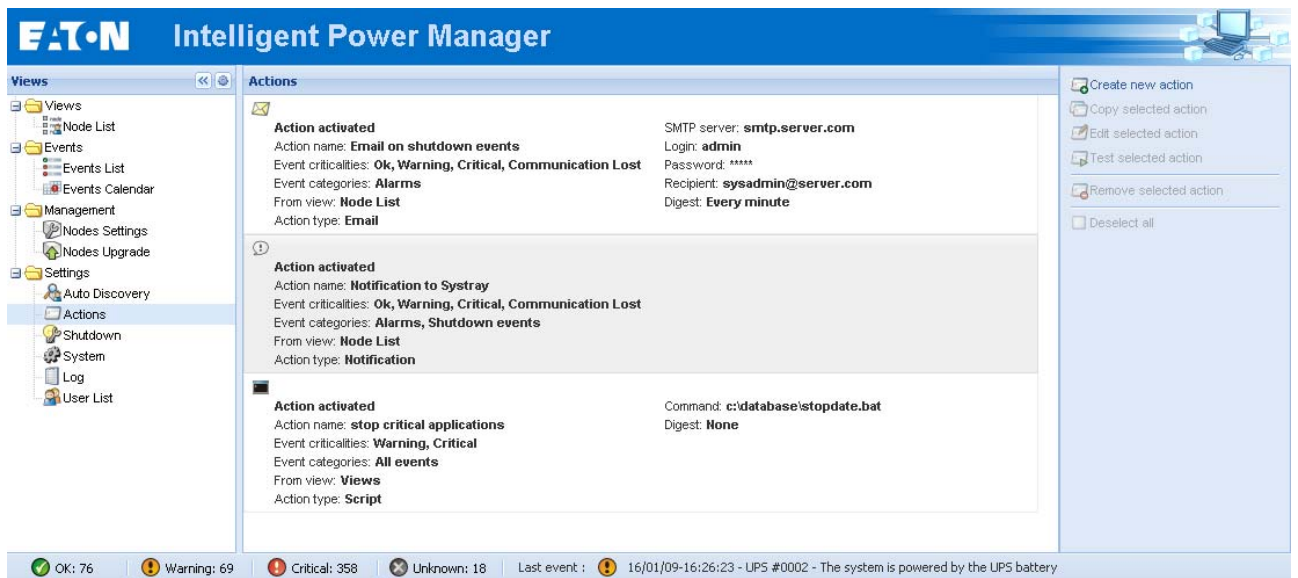
OK: 60
Warning: 48
Critical: 358
Unknown: 18
Last event : 16/01/09-16:08:20 - UPS #0003 - The system is powered by the utility

3.2.2 Configure Actions

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

From the **Settings → Actions** item; the following channels are available:

- E-mail
- Execute script/program
- Notification to Systray







Notifications summary window


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

Edit action

Action activated*: ☒

Action name*: Email on shutdown events

Event criticalities*:
 ☒ 
☒ 
☒ 
☒ 

Event categories*: Shutdown events 

From view*: Node List

Action type*: Email

Settings


SMTP server*: smtp.server.com


Login: admin

Password: *****

Recipient*: sysadmin@server.com

Sender: Intelligent Power Manager

Subject:  shutdown alarm from {hostname}

Message:  shutdown alarm from {hostname}

Digest*: Every minute

Save Cancel

Note: The “ * ” fields are required.

Events filter:

You can filter the e-mail notification according to:

- the event criticality. (Critical, Warning, Normal, Communication Lost)
- the event category (All Events, Alarms, Shutdown events, Power events, Measures)
- the view that triggers the event;

Note on Event Criticality parameter:

With this parameter, you can filter the notification according to the event level. Refer to the event list provided later 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”.

E-mail:

To receive emails on UPS events:

- you have to indicate the **SMTP server address** and **recipient e-mail address**;

For advanced use:

- you can **Customize the subject** e.g. if you have to translate an e-mail into an SMS .
- 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 **no delay**, each alarm will generate an e-mail. With this settings you will receive more emails for the same number of events)

Execute script/program:

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

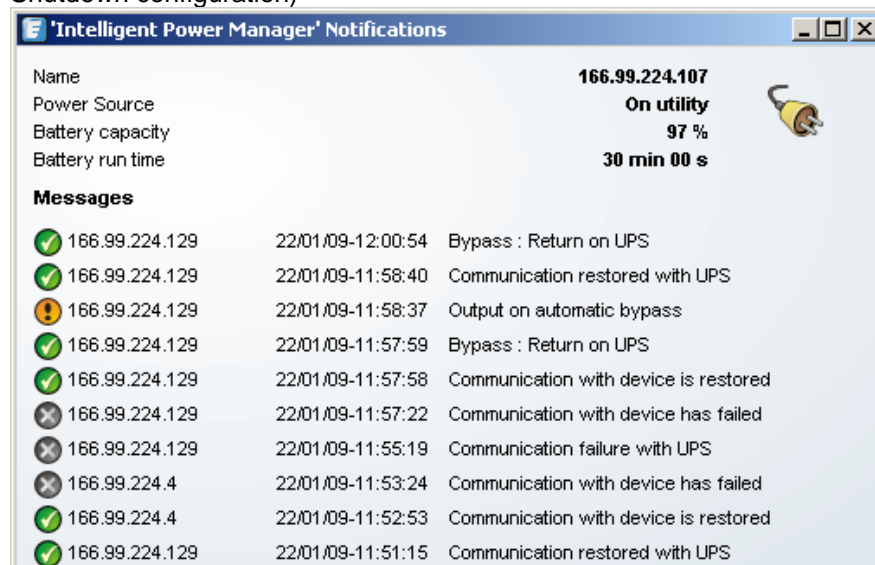
Note: The program is executed under the SYSTEM account.

- 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 Pack 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.

Alarm box notification:



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

The status part of the alarm box is optional (It only appears if a Power Source has been declared in the Shutdown configuration)








The systray provides access to the alarm box

If no Power source has been declared, it can have following states:

 (blue)	Systray correctly receives alarms from Intelligent Power® Manager (No Power Source has been declared)
 (grey)	Communication is lost between Systray and Intelligent Power® Manager

If a Power source has been declared, It can have following states:

	Systray correctly receives alarms from Intelligent Power® Manager (AC is present on the Power source)
	Systray correctly receives alarms from Intelligent Power® Manager (The Power Source runs in battery mode)
	Systray correctly receives alarms from Intelligent Power® Manager (A Warning event occurred on Power Source)
	Systray correctly receives alarms from Intelligent Power® Manager (A critical event occurred on Power Source)
	Communication with Power source has failed

Advanced events and actions customization:

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

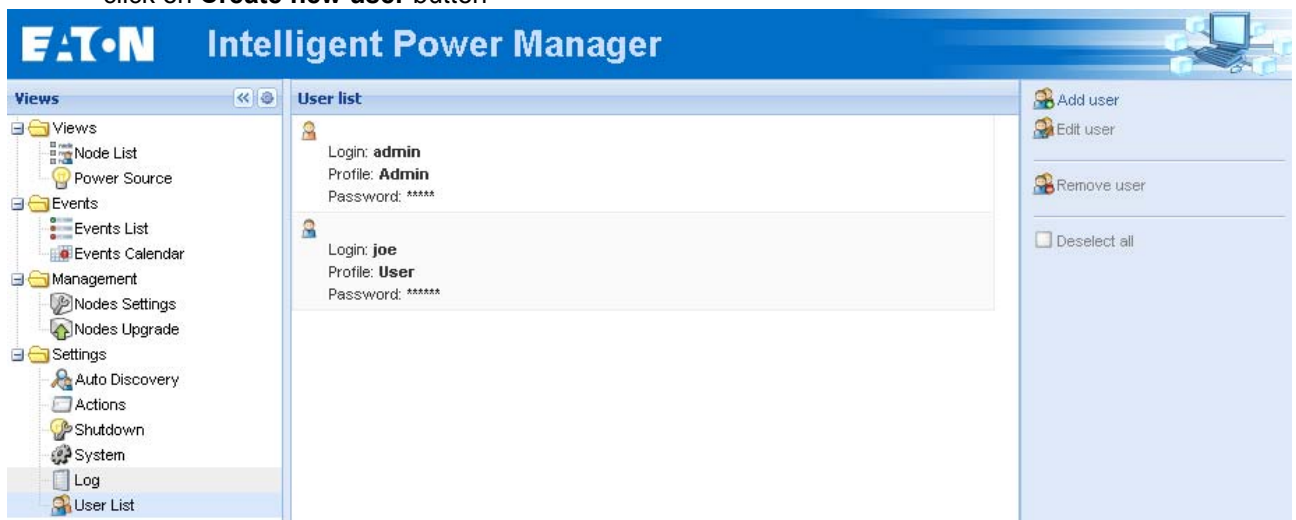
You have the possibility to modify this script or create new scripts that define very specific events and actions. The sample script provides details about the expected structure and syntax for defining new actions and triggers.

3.2.3 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
- enter 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 visualization and is not able to set changes to the system or nodes)
- click on **Create new user** button



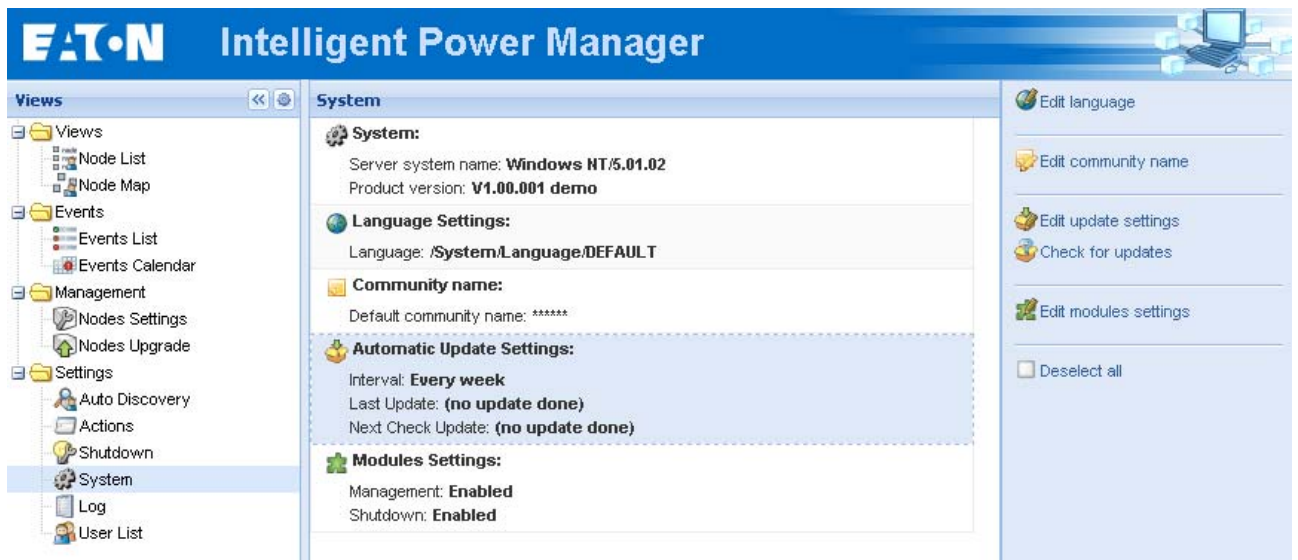
User Accounts window

Intelligent Power® Manager contains a default Administrator profile with

- admin as login
- admin as password

It is strongly recommended to change these settings with your own immediately after installation.

3.2.4 System settings



System settings

Select one of the items then click on the corresponding button on the right

- Edit language allows the user to change the user language.
- Edit community name changes the default SNMP community name for discovery.
- Edit updates & Check updates will provide Automatic Updates Features.
 This feature gives you access to Eaton software updates.
 Intelligent Power® Manager 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.
Note: Database information will be retained with this operation.
- Modules settings will activate / deactivate the management or shutdown Modules.

4 Supervision

4.1 Access to the monitoring interface

To monitor Eaton devices already discovered on the network, start the main “Intelligent Power® Manager” interface. You can access the same interface locally or remotely.

4.1.1 Local access

- From the system where the supervisor is installed, you can use the following shortcut:
Start -> Programs -> Eaton -> Intelligent Power Manager -> Open Eaton Intelligent Power Manager

4.1.2 Remote access

- From a remote machine, you can type the following URL in a Web browser
https://<name or IP address of computer hosting IPM>:4680/
or
http://<name or IP address of computer hosting IPM>:4679/
- In SSL mode, accept the certificate (by clicking on Yes)



Accepting the SSL Certificate

To install the certificate on IE7 for Vista, you need to perform the following steps:

- > Run IE as an administrator (Right-click the desktop icon)
- > Visit the IPM site.
- > Click through the certificate error
- > Click the "Certificate Error" button in the address bar.
- > Click View Certificate
- > Click Install Certificate
- > Click the "Place all certificates in the following store" radio button, and choose the "Trusted Root Certification Authorities" store. If you don't do this, the certificate goes in your personal store, and it isn't trusted by IE.

- Enter the Login and Password

4.2 Node List View

Eaton Intelligent Power Manager

Views

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 - Settings
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 - Actions
 - Shutdown
 - System
 - Log
 - User List

Node List

Type	Status	Name	Description	Location	Contact	Link
UPS	Warning	UPS #0001	Evolution 2200	Floor 1	Arnaud	
UPS	Warning	UPS #0002	Pulsar 1000 RT2U	Floor 2	Séb	
UPS	Warning	UPS #0003	Evolution 500	Floor 2	Luc	
UPS	Warning	UPS #0004	Evolution 500	Floor 1	Luc	
UPS	Warning	UPS #0005	Pulsar Extreme 3200C	Floor 2	Séb	
APP	OK	APP #0001	NSM Linux	Floor 2	Arnaud	
APP	OK	APP #0002	NSM Linux	Floor 2	Séb	
APP	Warning	APP #0003	NSM Linux	Floor 3	Luc	
APP	Warning	APP #0004	NSM Linux	Floor 2	Arnaud	
APP	Warning	APP #0005	NSM Linux	Floor 1	Séb	
PDU	OK	PDU APHEL1 #0001	Aphel PDU212345 Ge	http://www.apheltech	info@aphel.com	
PDU	OK	PDU APHEL1 #0002	Aphel PDU212345 Ge	http://www.apheltech	info@aphel.com	
PDU	OK	PDU APHEL2 #0001	DBQ10634/5 my_devi	Floor 3	Yoann	
PDU	OK	PDU APHEL2 #0002	DBQ10634/5 my_devi	Floor 1	Luc	
PDU	OK	PDU PULIZZI1 #0001	Powerware ePDU			
PDU	OK	PDU PULIZZI2 #0001	Switched ePDU	Floor 2	Yoann	
PDU	OK	PDU PULIZZI2 #0002	Switched ePDU	Floor 1	Yoann	
PDU	OK	PDU MGE #0001	SwitchedPDU_81009	Floor 3	Yoann	
PDU	OK	PDU MGE #0002	SwitchedPDU_81009	Floor 2	Eric	
166.99.224.166	Warning	Evolution 650	Computer Room	Computer Room M		
166.99.224.168	OK	Evolution 650	Computer Room	Computer Room M		
166.99.224.111	OK	Windows				
166.99.224.136	Warning	Rack 2700	Computer Room	Computer Room M		
166.99.224.97	OK	PW9130 700	Computer Room	Computer Room Mana		

Selection view

Information

UPS #0004

Description: Evolution 500
Location: Floor 1
Contact: Luc
Serial number: 0123456789
Link:

Status

Bypass: On automatic bypass
Bypass: On manual bypass
Power Source: On utility
Battery state: Charging
Load level: 100 %
Battery capacity: 65 %
Battery run time: 138 h 53 min 20 s
Outlet #2: On
Outlet #3: On

Graph

Date: 2009/01/16-15:27:52
Load level: 15 %
Battery capacity: 47 %
Battery run time: 50 s

Status

Status	Date	Message
OK	16/01/09-15:43:16	The system is powered
Warning	16/01/09-15:39:16	The system is powered
Warning	16/01/09-15:35:15	The UPS output is off
Warning	16/01/09-15:34:04	The system is powered
OK	16/01/09-15:26:03	The system is powered

Page 1 of 2 | 25 Items per page | Displaying 1 - 25 of 27

OK: 26 | Warning: 31 | Critical: 350 | Unknown: 10 | Last event : 16/01/09-15:49:17 - UPS #0003 - The system is powered by the utility

Node List.

The following default columns are displayed in this page:

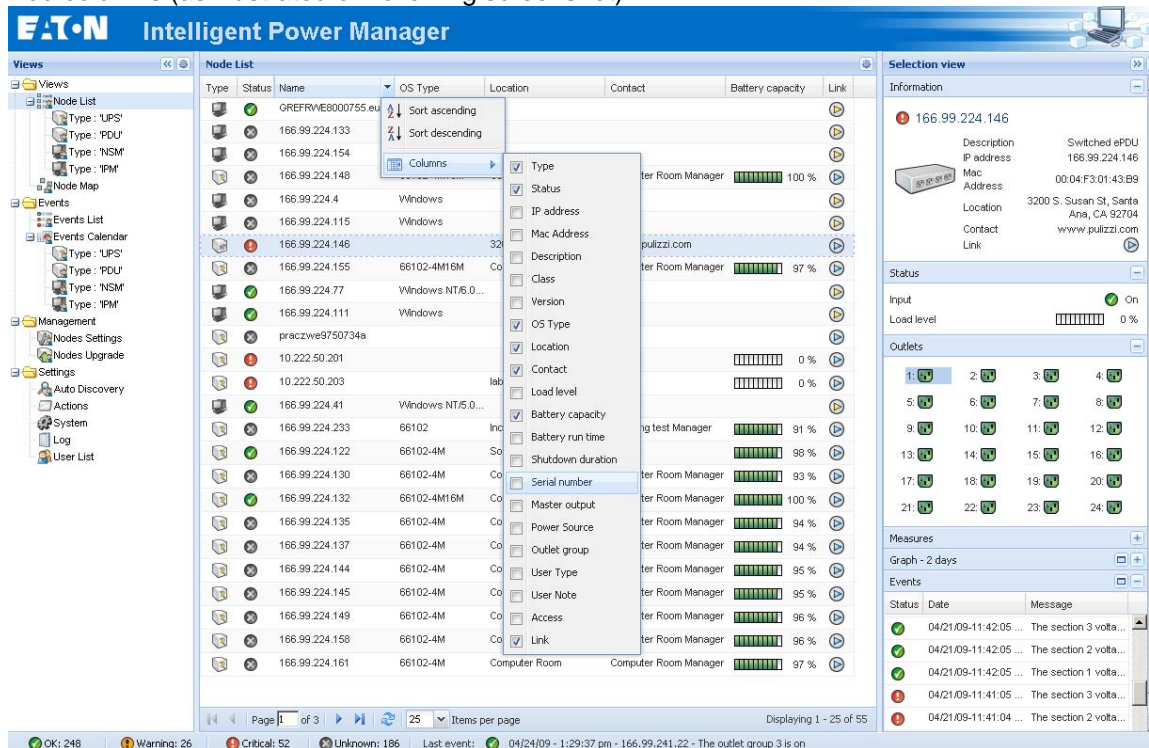
- Type: Graphical Icon to differentiate UPS, ePDU, Applications
- Status: this icon represents the severity of the most critical event active on the monitored device;
- Name: the IP address, the DNS name or user defined name
- Description: the product name or description
- Location: the node location
- Contact: the node contact
- Link: link to the device Web site (if available)

Note: You can sort your device list by clicking on the column titles (Status / Name / Description/ Location / Load Level ...)




The following possibilities are available:

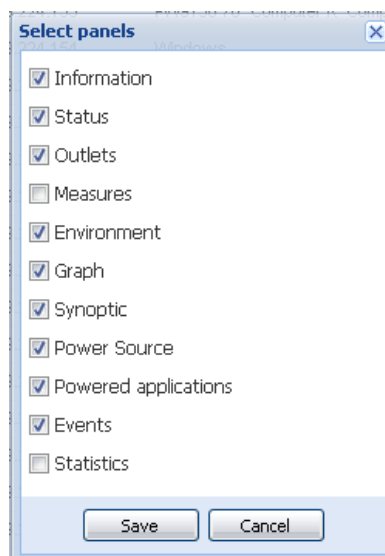
- Sort ascending
- Sort Descending

- Add columns (as illustrated on following screenshot)



4.3 Flexible Panels view:

- Select one of the device/applications in the list and “detailed Panels” appears
- Clicking on the bar title allows you to collapse/extend the panel
- These buttons allows to hide  or show  all the panels
- This button  allows to select which panel you want to add in the view



Some of these panels are only available for specific node types.

4.4 Panels list:

4.4.1 Information



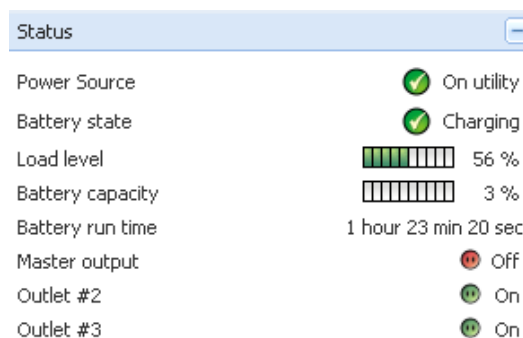
Information Panel.

The following node information is displayed in this panel:

- UPS #0005 the DNS name (or IP address) is displayed near the “status icon”
- Description the commercial product name
- Location the device location (value of syslocation object or can also be configured in the Device page)
- Contact the device contact (value of syscontact object or can also be configured in the Device page)
- Serial Number The device Serial Number (if available)
- Link link to the device Web site (if available)

Note: The information displayed in this panel depends on the node capabilities.

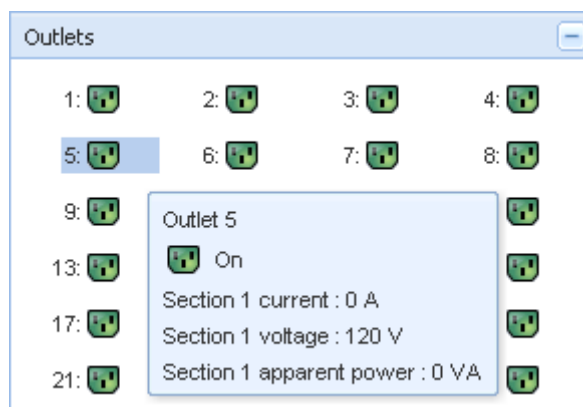
4.4.2 Status



- Power source AC Power / Battery
- Battery state Charging / Discharging / Needs Replacement
- 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)
- Outlet #x output outlet status (ON/OFF)

Note: The information displayed in this panel depends on the node capabilities.

4.4.3 Outlets



This panel displays outlet status of the selected ePDU.

Note: When you select an outlet in this panel, the Graph panel displays the information for this outlet.

Outlets color codes:

Symbol	Colour	Description
	Green	Powered (On)
	Red	Not powered (Off)

4.4.4 Measures

Measures			
Input frequency			50 Hz
Output frequency			1.4 Hz
Input voltage	238 V	238 V	238 V
Input current	6 A	5 A	5 A
Output voltage	238	238	239
Output current	2 A	0 A	0 A

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

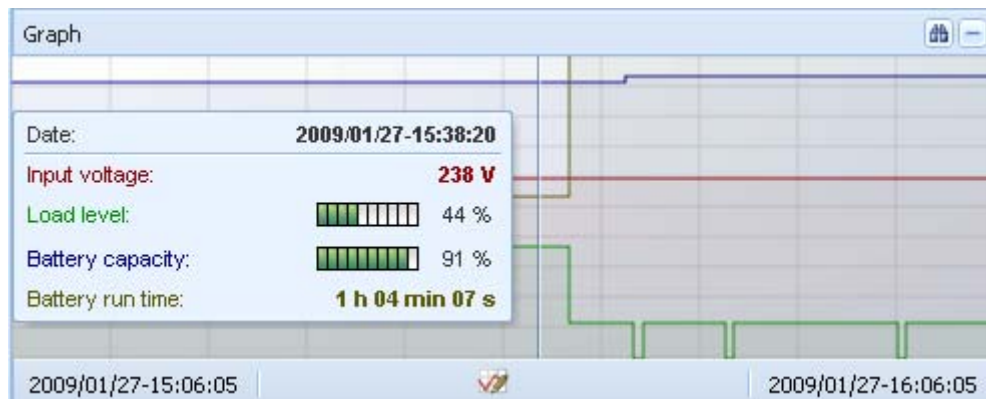
4.4.5 Environment

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

This panel displays the selected device sensor information: Temperature, Humidity level, Dry contact status (Open/Closed)

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

4.4.6 Graph

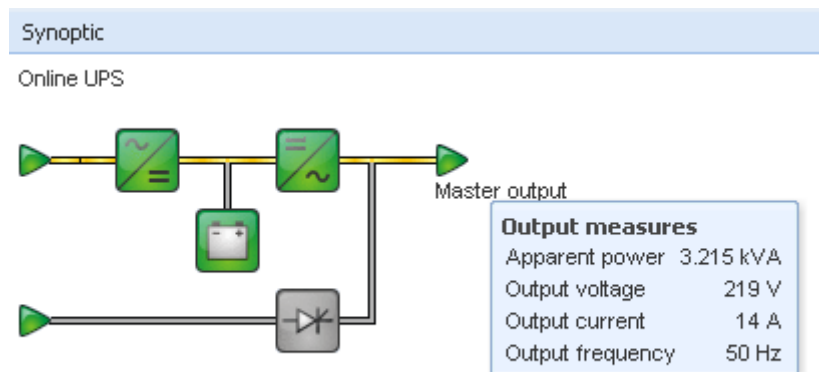


This panel displays the graph of the main measures of the selected device.

The button allows you to zoom the graph

The button allows you to select the data you want to graph

4.4.7 Synoptic



This panel displays the selected device synoptic. A tooltip is displayed when the mouse is over one of the functional block.





Synoptic Color codes:

- UPS modules:



AC/DC	DC/AC	By-Pass	Colour	Description
			Green	Status OK & Active
			Red	Internal fault & Inactive

			Grey	Status OK & Inactive or Unknown
-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	------	---------------------------------



- Battery module:

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



- Electrical flows:

Symbol	Colour	Description
	Yellow	Current flow through the cable Note: the object animation gives the direction of current flow
	Grey	No current flow through the cable (voltage may be present)




- Electrical power source at UPS input:

Symbol	Colour	Description
	Green	Source powered. Status OK
	Grey	Source not powered or status unknown



Examples of combinations between flow status and power source status:

	Green/ Yellow	The electrical power source is powered and provides electrical flow
	Green/ Grey	The electrical power source is powered and does not provide electrical flow


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

Symbol	Colour	Description
	Green	Load powered and protected. Status OK
	Red	Load not powered
	Grey	Load status unknown

Examples of combinations between flow status and load status:



	Yellow/ Green	Load powered and protected
	Grey/ Red	Load not powered

4.4.8 Power Source

Power Source	
Node	166.99.250.82
Description	Evolution 850
Location	Bureau
Contact	Seb
Link	
Load segment	Master outlet

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







4.4.9 Powered applications

Powered applications				
Status	Name	Shutdown diag	Shutdown dur	Outlet group
	166.99.250.10		2 min 00 s	1

Runtime to shutdown: 22 min 20 s
 Shutdown duration: 2 min 00 s
 Off time: 15 min 15 s

This panel displays information on the applications that are powered by the selected device.


4.4.10 Events

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

This panel displays the events list of the selected node.

4.4.11 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  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.

4.5 Applications List View

To create a sub-view that filters applications, right click on **Node List**, then **create a Sub View** from and select **Category** as criteria to filter the nodes.

Network Shutdown Module V3 can be monitored in this View

EATON Intelligent Power Manager

Views

- Views
 - Node List
 - Category: 'Devices'
 - Category: 'Application'
 - Power Source
 - Events
 - Events List
 - Events Calendar
 - Management
 - Nodes Settings
 - Nodes Upgrade
 - Settings
 - Auto Discovery
 - Actions
 - Shutdown
 - System
 - Log
 - User List

Node List

Type	Statu	Name	Description	Location	Contact	Link	User Typ	User
Windows	OK	166.99.224.111	Windows					
Windows	Warning	166.99.224.154	Windows					
Windows	OK	166.99.224.4	Windows					
Windows	OK	166.99.224.90	Windows					
Linux	OK	166.99.250.103	Linux	Seb	Seb			

Selection view

Information

166.99.250.103

Description: Linux
Location: Seb
Contact: Seb
Link: [Link Icon]

Status

Shutdown duration: 2 min 00 s

Power Source

Node: 166.99.250.82
Description: Evolution 850
Location: Bureau
Contact: Seb
Link: [Link Icon]
Load segment: Master outlet

Events

Status	Date	Message
OK	26/01/09-08:34:54	Communication with device is restored
Warning	26/01/09-08:33:22	Communication with device has failed

Page 1 of 1 | 25 Items per page | Displaying 1 - 5 of 5

OK: 410 | Warning: 22 | Critical: 142 | Unknown: 275 | Last event: 27/01/09-16:51:07 - 166.99.224.99 - Communication with device has failed

The following information appears in this page:

- **Type** Application
- **Status** This icon represents the status criticality of the server.
- **Name** Value configured in the Applications screen (by default this is an IP address or a DNS name).
- **Description** Machine operating system.
- **Power source** the UPS that power the application
- **Run time** Operating time in the event of a utility supply loss.
- **Shutdown duration** Duration, in seconds, needed by the system to carry out its shutdown procedure.
- **Link** Link to the Web supervision interface of the Network Shutdown Module V3 module.


4.6 Map View

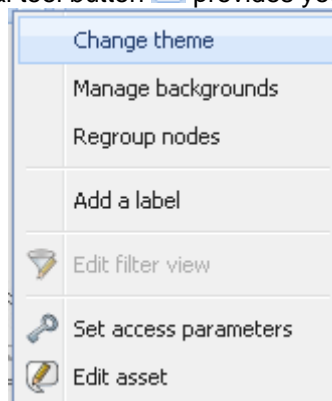
This graphical representation allows you to organise the supervision Map using the Drag & Drop feature
Select a node icon and the information will be updated on the right hand panel

4.6.1 Create a customized Map View

On the Left hand menu, Select **Views -> Node Map**

The Map is automatically generated (icons are automatically placed on the Map and IP address assigned)

On the Node Map bar title the contextual tool button  provides you the tools to modify the Map



Change theme offers three kinds of icons representations for the user (small icons, large icons, rack icons)

Manage backgrounds will offer you the possibility to:

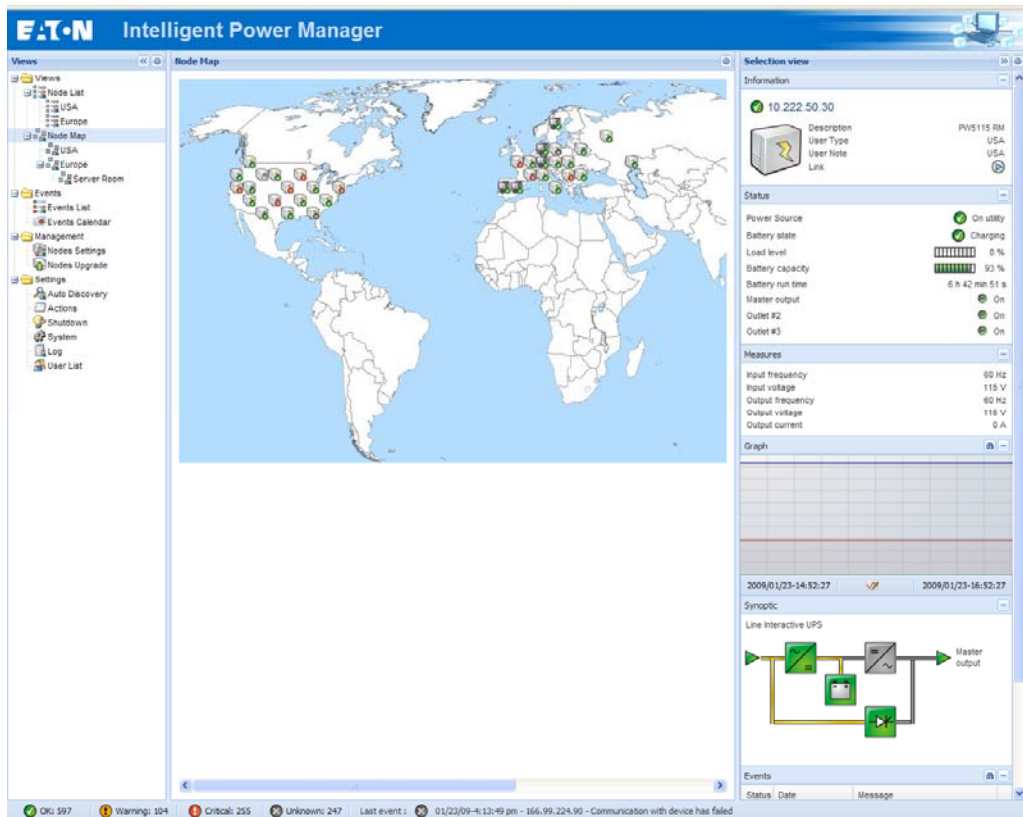
- import a new background image in the supervision tool
- select a background already in the supervision tool for the Map
- remove the background images

Regroup nodes will rearrange the icons position on the Map

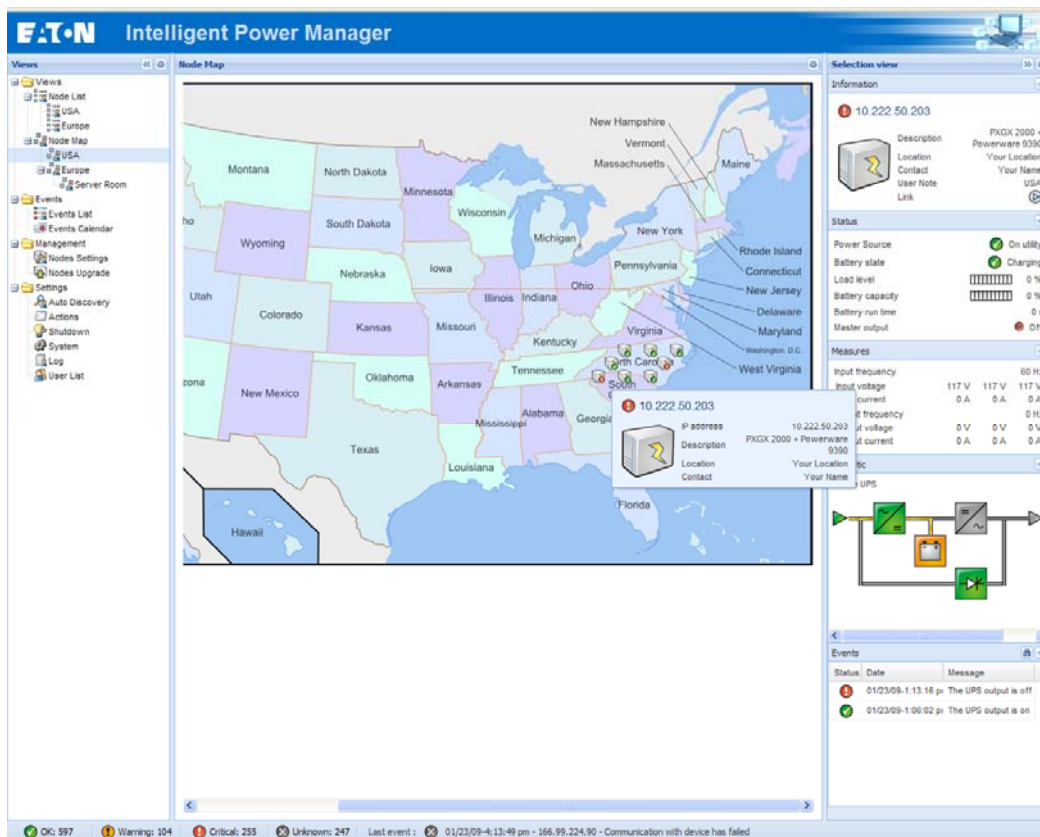
Add a label allows to create a user defined text and to place it on the Map through drag and drop

Note: to delete a label, right click on it then **Delete**.

4.6.2 Maps examples



World Map view



Country Map view

Eaton Intelligent Power Manager

Views

- Views
 - Node List
 - USA
 - Europe
 - USA
 - Europe
 - Server Room
- Events
 - Events List
 - Events Calendar
- Management
 - Nodes Settings
 - Nodes Upgrade
- Settings
 - Auto Discovery
 - Actions
 - Shutdowns
 - System
 - Log
 - User List

Node Map

166.99.224.146

IP address: 166.99.224.146
 Description: Switched ePDU
 Location: 3200 S. Susan St, Santa Ana, CA 92704
 Contact: www.pulizzi.com

Selection view

Information

166.99.224.146

Description: Switched ePDU
 Mac Address: 00:04:F3:01:43:09
 Location: 3200 S. Susan St, Santa Ana, CA 92704
 Contact: www.pulizzi.com
 User Note: E108
 Link

Status

Input: On

Outlets

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24

Measures

Events

Status	Date	Message
✓	01/23/09-1:13:16 pm	The humidity 1 is in no
!	01/23/09-1:13:16 pm	The humidity 1 is abov
✓	01/23/09-1:13:10 pm	Communication with d
✓	01/23/09-1:07:02 pm	Communication with d
!	01/23/09-1:06:02 pm	The humidity 1 is belo
✓	01/23/09-1:06:02 pm	The humidity 1 is in no

OK: 997 Warning: 104 Critical: 235 Unknown: 247 Last event : 01/23/09-4:13:49 pm - 166.99.224.90 - Communication with device has failed

Server Room Map view

4.7 Events

4.7.1 List representation

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

Status	Date	Name	Message	Ack
Warning	21/01/09-08:44:28	166.99.224.129	Output on automatic bypass	✓
Warning	21/01/09-08:46:22	166.99.224.4	Communication with device has failed	✓
Warning	21/01/09-09:04:37	166.99.250.76	The outlet group 2 is off	✓
Warning	21/01/09-09:11:53	166.99.224.56	Communication with device has failed	✓
OK	21/01/09-09:15:47	166.99.250.112	Communication failure with environment sensor	✓
Warning	21/01/09-09:30:31	166.99.224.146	The temperature 2 is above high threshold	✓
Warning	21/01/09-09:30:31	166.99.224.146	The humidity 1 is above high threshold	✓
Warning	21/01/09-10:11:25	166.99.224.129	Communication with device has failed	✓
OK	21/01/09-10:20:43	166.99.224.129	Communication with device is restored	✓
Warning	21/01/09-10:26:42	166.99.250.83	Communication with device has failed	✓
OK	21/01/09-10:27:15	166.99.250.83	Communication with device is restored	✓
Warning	21/01/09-10:27:17	166.99.250.83	Communication failure with UPS	✓
Warning	21/01/09-10:27:17	21 January 2009 10:27:17	The UPS output is off	✓
OK	21/01/09-10:27:36	166.99.250.83	Communication restored with UPS	✓
OK	21/01/09-10:27:36	166.99.250.83	The UPS output is on	✓
Warning	21/01/09-10:36:02	166.99.250.83	Communication with device has failed	✓
OK	21/01/09-10:36:35	166.99.250.83	Communication with device is restored	✓

Page 1 of 35 | 25 Items per page | Displaying 1 - 25 of 852

OK: 0 | Warning: 0 | Critical: -1 | Unknown: 0 | Last event : 27/01/09-18:09:10 - 166.99.224.95 - Communication with device has failed

Alarms list.

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

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";"0";"UPS.PowerConverter.Input[1].Frequency";"49";"";
```

Note: Export command may take several seconds before allowing download to create logs file

Select all will select all displayed events

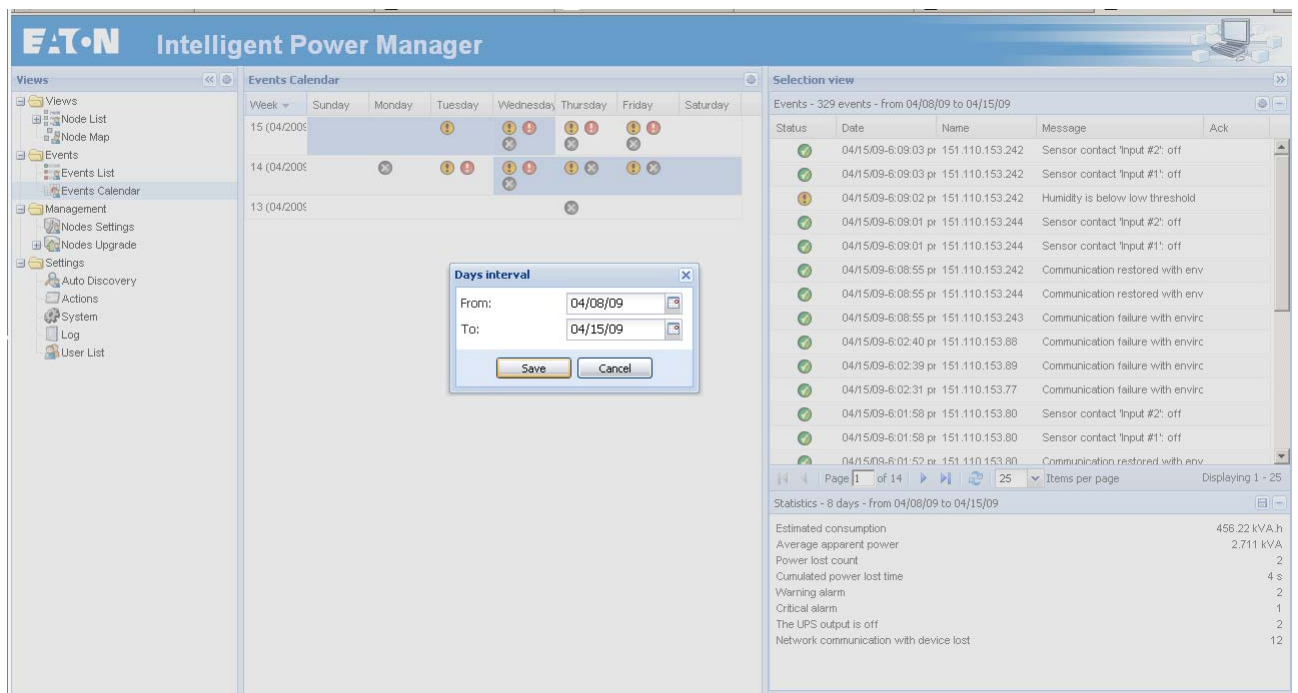
Deselect all will deselect all selected events

4.7.2 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 datepicker 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.



4.7.3 Nodes Events list

The icons in the different views represent the event severity.

Icon Event status



Normal. With this event, the device is coming back to a normal status.

Event list list (UPSs, ePDUs, Applications, Generic devices):

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

-
- Protection restored

Event list (ePDUs specific):

- The input frequency is in normal range
- The input temperature is in normal range
- The input voltage is in normal range
- The input {x} is in normal load
- The section {x} current is in normal range
- The section {x} voltage is in normal range
- The outlet group {x} current is in normal range
- The outlet group {x} is in normal load
- The outlet group {x} is on
- The phase {x} output load is in normal range
- The output frequency is in normal range
- The output load is in normal range
- The output voltage is in normal range



Warning. A problem occurred on the device. Your application is still protected.

Event list list (UPSs, ePDUs, Applications, Generic devices):

- The system is powered by the UPS battery
- Output on automatic bypass
- Output on manual bypass
- Humidity is below low threshold
- Humidity is above high threshold
- Temperature is below low threshold
- Temperature is above high threshold
- Warning Alarm *(a generic Warning alarm is active on the device)*
- The device is under its load alarm threshold
- The device is over its load alarm threshold
- Protection lost
- Redundancy lost
- Shutdown in {time}



Critical. A serious problem occurred on the device. This problem requires an urgent action. Your application might NOT BE powered anymore.

Event list list (UPSs, ePDUs, Applications, Generic devices):

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



Event list (ePDUs specific)

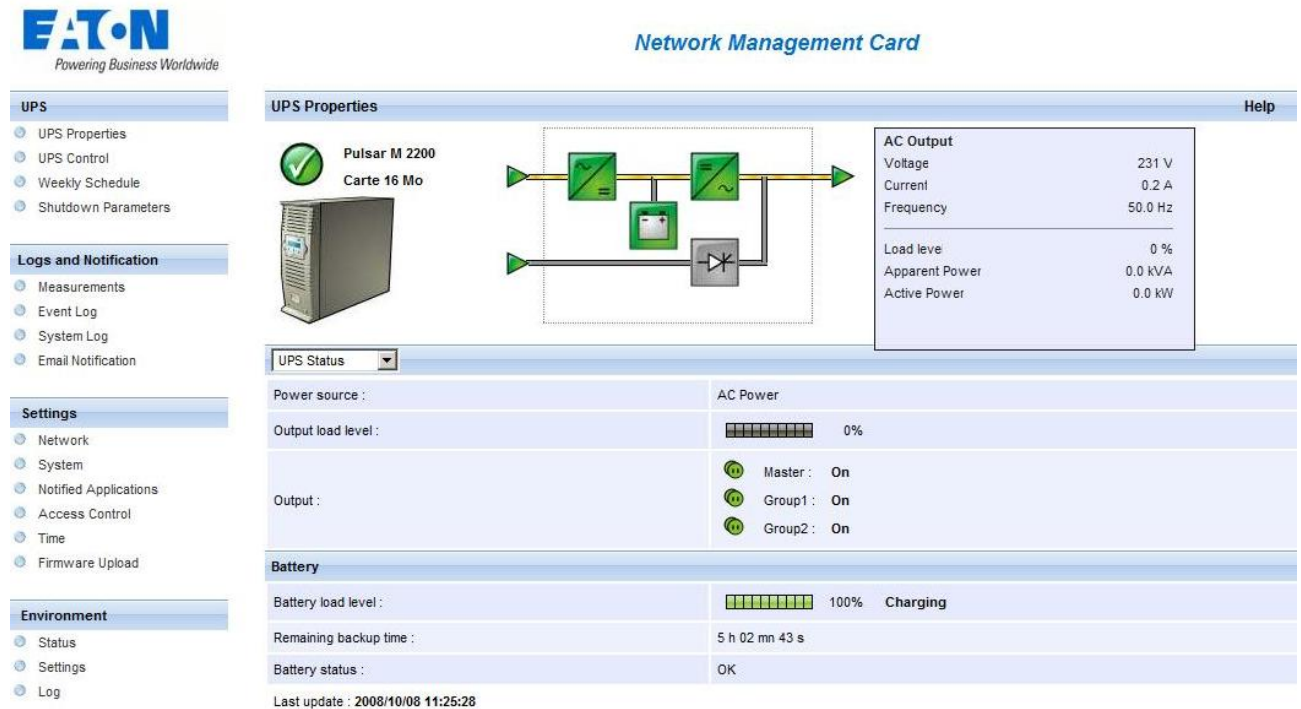
- The input frequency is out of range
- The input temperature is above high threshold
- The input temperature is below low threshold
- The input voltage is above high threshold
- The input voltage is below low threshold
- The input {x} is overload
- The section {x} current is too high
- The section {x} current is too low
- The section {x} voltage is too high
- The section {x} voltage is too low
- The outlet group {x} current is too high
- The outlet group {x} current is too low
- The outlet group {x} is overload
- The outlet group {x} is off
- The phase {x} output is overload
- The output frequency is out of range
- The output is overload
- The output voltage is above high threshold
- The output voltage is below low threshold

**Communication lost****Event list:**

- Communication failure with UPS
 - The communication with the server has been lost
 - Communication with device has failed
-

4.8 Launching Device or application Web interface

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



EATON
Powering Business Worldwide

Network Management Card

UPS Properties

Pulsar M 2200
Carte 16 Mo

AC Output	
Voltage	231 V
Current	0.2 A
Frequency	50.0 Hz
Load level	0 %
Apparent Power	0.0 kVA
Active Power	0.0 kW

UPS Status

Power source : AC Power

Output load level : 0%

Output :

- Master : On
- Group1 : On
- Group2 : On

Battery

Battery load level : 100% Charging

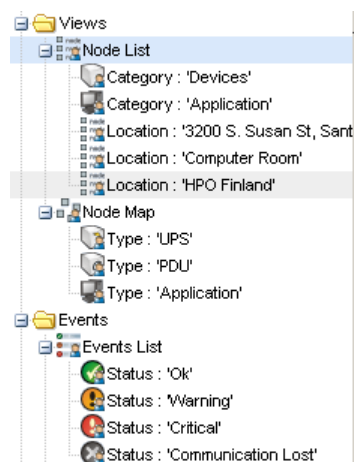
Remaining backup time : 5 h 02 mn 43 s

Battery status : OK

Last update : 2008/10/08 11:25:28

Running the node Web interface from Intelligent Power[®] Manager.

4.9 Defining sub views

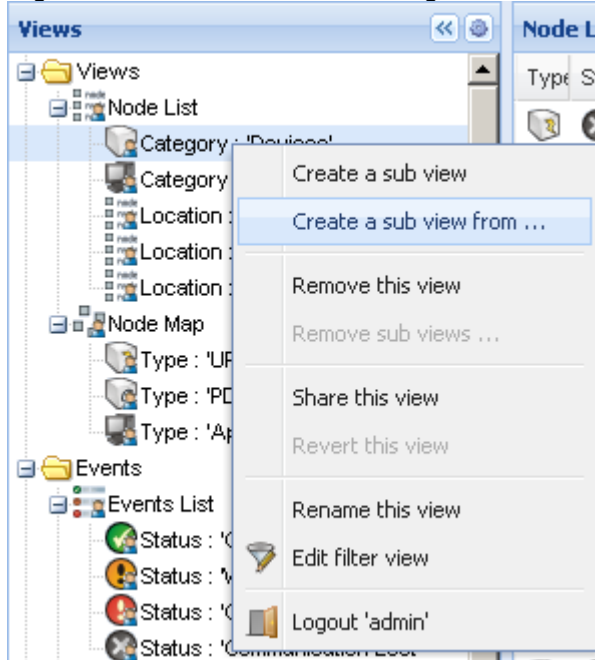


When you have to monitor large configurations, it is helpful to define several sub views and then filter the nodes or events in these categories.

You can select many criteria in order to organize your tree (i.e. geographical, organizational, by status,)

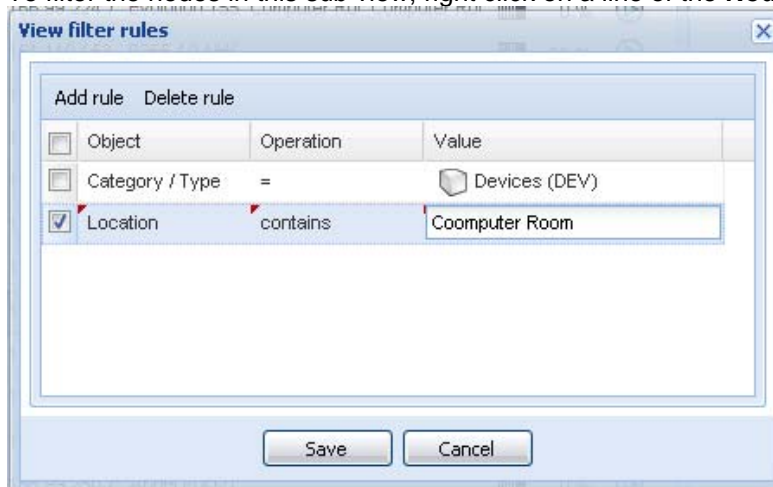
- Select a view in the left menu (e.g. Devices)

- Right click on this view and following contextual menu appears



Click on **Create a sub view from ...** and follow the instructions

- To filter the nodes in this sub view, right click on a line of the **Node List** area and edit a **Filter View**



- To add a filtering rule, click on the **Add rule** button then key in the Object, Operation and Values
With this filter you will view the **Devices** whose **Location** field contains the value **"Computer Room"**

5 Shutdown

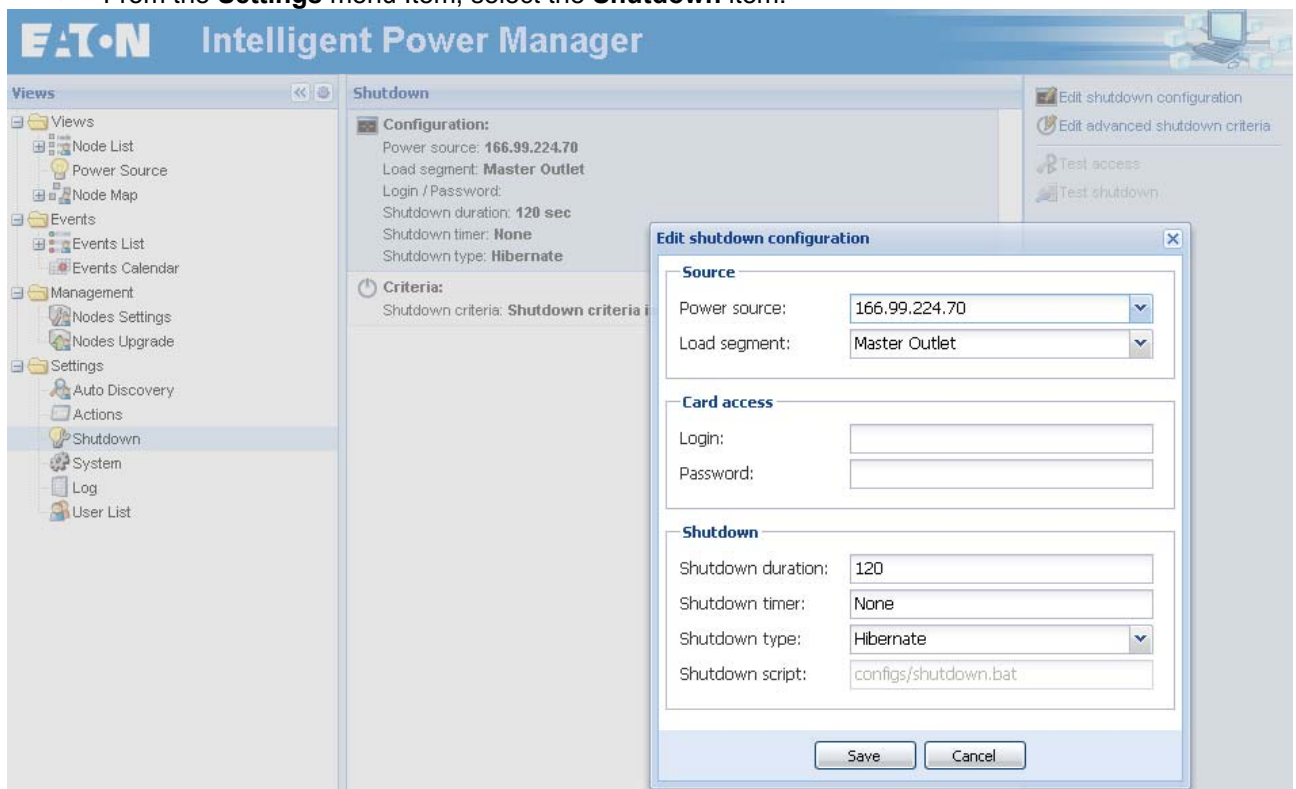
5.1 Introduction

Intelligent Power® Manager provides **local computer graceful shutdown** (acquisition through 66102, 66103 103 006 826 Network Management Cards)

This Shutdown feature can be Enabled / Disabled from the **Settings -> System -> Modules Settings**

5.2 Shutdown Configuration

- Login with an administrator user profile
- From the **Settings** menu Item, select the **Shutdown** item:



To configure, perform the following actions:

- Click on **Edit shutdown configuration**
- In the **Power source** field select the UPS that powers the computer hosting Intelligent Power® Manager
- Check other parameters
- Click on Save

Note: Shutdown through Hibernate

- If available with your operating system, is better to use the hibernation feature (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.
The hibernate function must first have been activated in the operating system. In the power options on the Windows control panel, check that the **hibernate** option is activated on the Hibernate tab

sheet.

Note: If you select hibernate, but your computer does not have this function, Intelligent Power® Manager will still protect the installation by carrying out the normal (default) shutdown.

5.3 Power Source View

When **Shutdown** feature is configured, from the **Views** menu Item, select the **Power Source** item: You will be able

- to supervise the information from the UPS that powers the Intelligent Power® Manager computer
- to drag and drop the panels in this window

The screenshot displays the Eaton Intelligent Power Manager software interface. The left sidebar shows a tree view with categories like Views, Events, Management, Settings, and Actions. The 'Power Source' item is selected under the 'Views' category. The main window is titled 'Power Source' and contains several panels:

- Information and Status:** Displays the IP address 166.99.224.70, a description of the UPS, and various status indicators such as 'On utility', 'Charging', 'Load level', 'Battery capacity', 'Battery run time', 'Master output', 'Outlet #2', and 'Outlet #3'.
- Synoptic:** Shows a schematic diagram of the Line Interactive UPS system.
- Measures:** A panel for monitoring measurements, currently empty.
- Powered applications:** A panel for monitoring powered applications, currently empty.
- Graph:** A line graph showing data over time, with a time range from 2009/01/30-11:42:55 to 2009/01/30-13:42:55.
- Events:** A table listing recent events with status, date, and message.

Status	Date	Message
✓	01/30/09-10:58:03 am	Communication with device is restored
✗	01/30/09-10:56:32 am	Communication with device has failed
✓	01/30/09-10:50:29 am	The UPS output is on
✓	01/30/09-10:50:29 am	Communication restored with UPS
!	01/30/09-10:50:09 am	The UPS output is off
✗	01/30/09-10:50:09 am	Communication failure with UPS
✓	01/30/09-10:50:06 am	Communication with device is restored

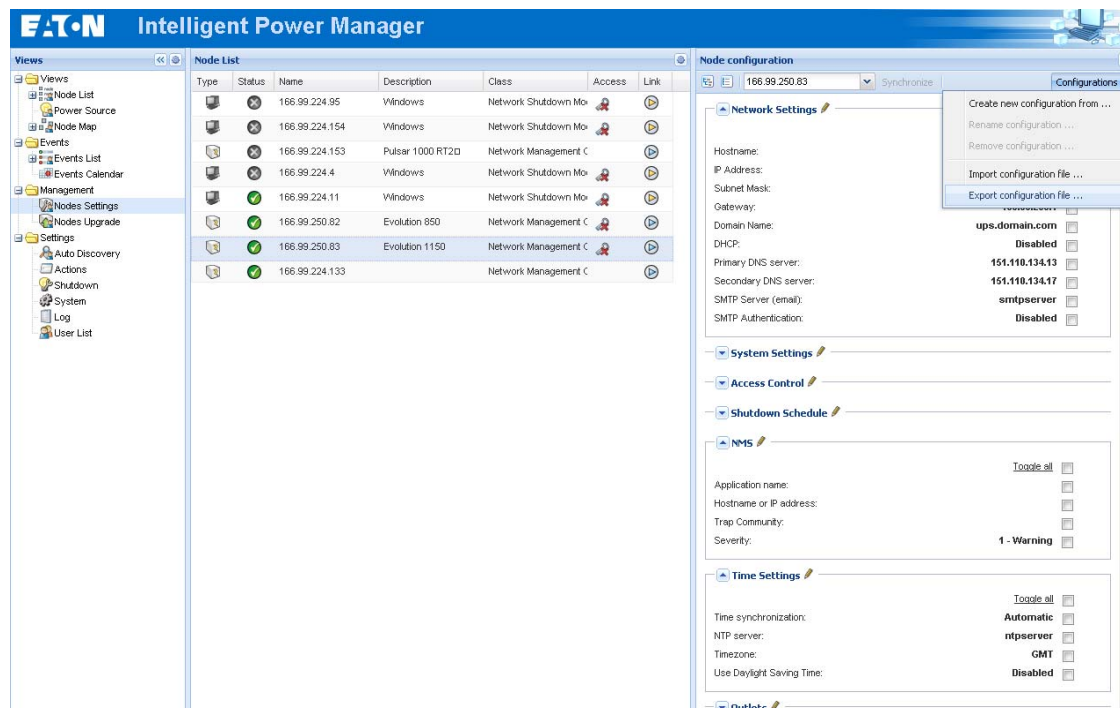
6 Advanced Management

6.1 Nodes Settings

6.1.1 Single node Configuration Display

Intelligent Power® Manager can display the card/application configuration. Proceed as follows:

- select one card from the list.
- after a few seconds, on the right hand, the Node configuration panel is updated.
- Using the Configurations-> Export Configuration file you can export this configuration to a file



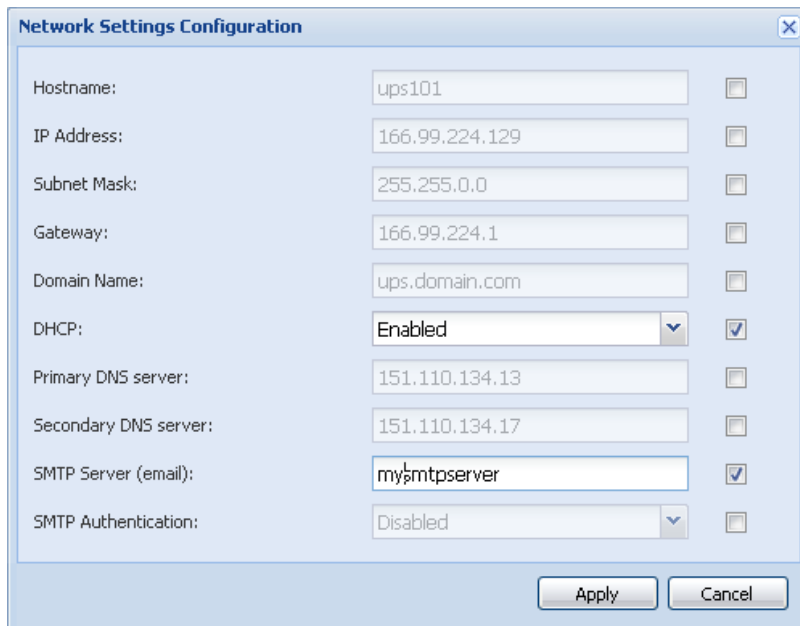
6.1.2 Single Card settings

Intelligent Power® Manager can configure a single card. Proceed as follows:

- login with an **administrator** user profile
- select one card from the list
- from the Node List button -> **Set Login Parameters**, enter the card Login and Password

The access status changes from: **Access Denied** to **Access OK**

- after a few seconds, the Node configuration panel is updated
- click on the Edit button [or load a previously created configuration]
In the Configuration Window check the parameters you want to change and fill in the new values



The image shows a 'Network Settings Configuration' dialog box with the following fields and checkboxes:





Field	Value	Checkbox
Hostname:	ups101	<input type="checkbox"/>
IP Address:	166.99.224.129	<input type="checkbox"/>
Subnet Mask:	255.255.0.0	<input type="checkbox"/>
Gateway:	166.99.224.1	<input type="checkbox"/>
Domain Name:	ups.domain.com	<input type="checkbox"/>
DHCP:	Enabled	<input checked="" type="checkbox"/>
Primary DNS server:	151.110.134.13	<input type="checkbox"/>
Secondary DNS server:	151.110.134.17	<input type="checkbox"/>
SMTP Server (email):	mysmtpserver	<input checked="" type="checkbox"/>
SMTP Authentication:	Disabled	<input type="checkbox"/>

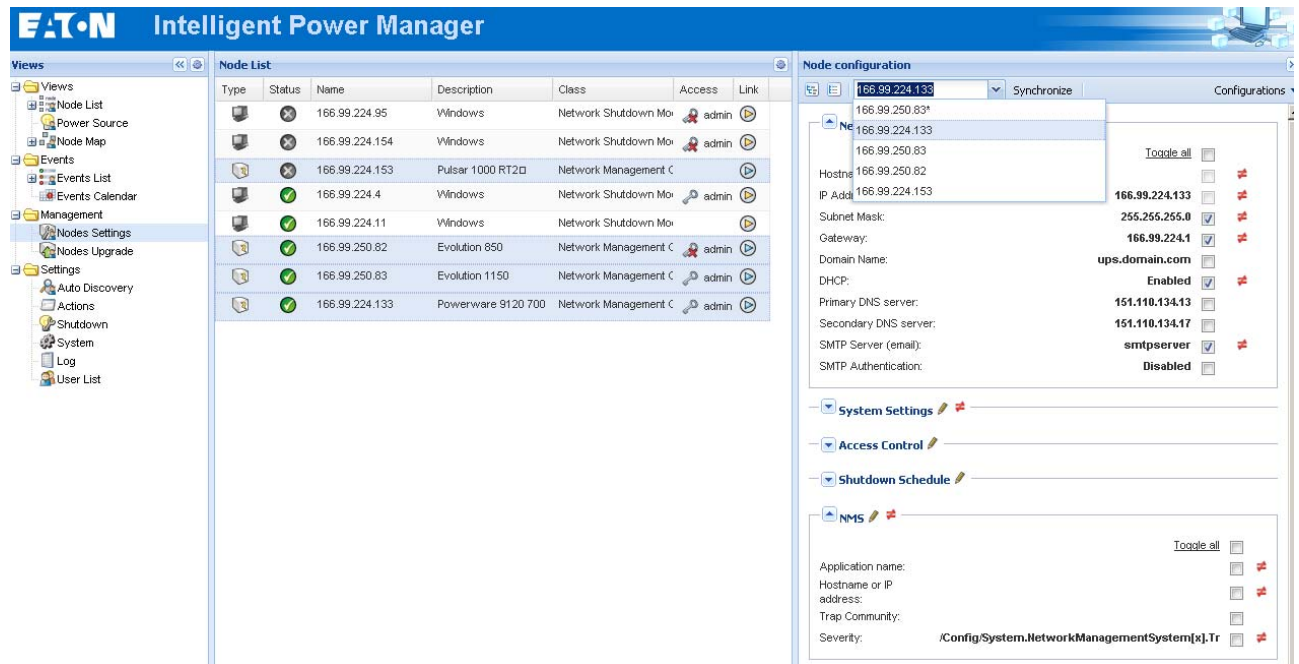
Buttons: Apply, Cancel

- **Apply**
- the parameters that have different values on the cards and on the configuration to apply have following sign “≠”
- then select the parameters you want to synchronize (with the check box)
- then click on **Synchronize** button

6.1.3 Multiple Cards Configurations Synchronisation

Intelligent Power® Manager can synchronise multiple card configuration. Proceed as follows:

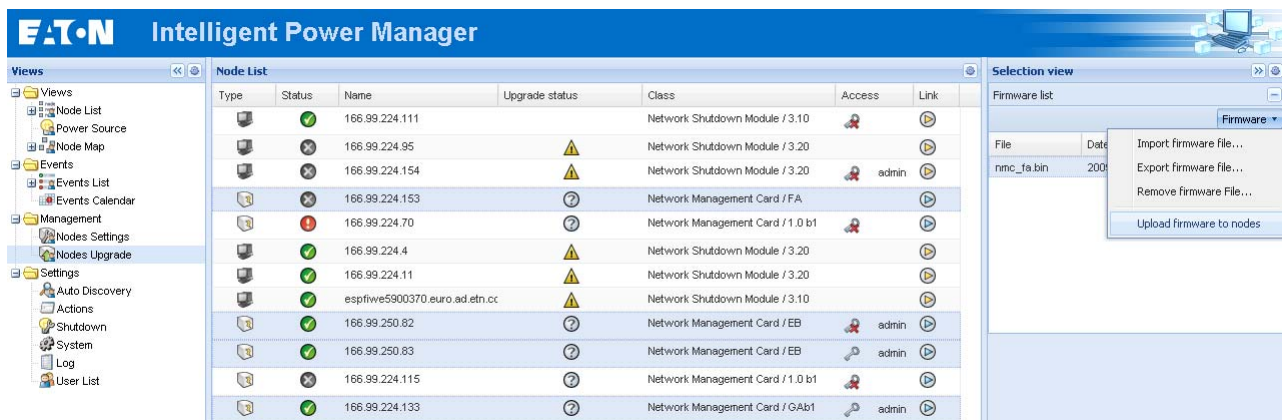
- select several card from the list
 - from the Node List button  -> **Set Login Parameters**, enter the card Login and Password
- The access status changes from: **Access Denied**  to **Access OK** 
- after a few seconds, the **Node configuration** panel is updated
 - from the combo box select the configuration that will be the model [or Click on the Edit button ]
 - the parameters that have different values on the cards have following sign “≠”
 - select the parameters you want to synchronize (with the check box)
 - click on **Synchronize** button



6.2 Nodes Upgrade

6.2.1 Upload Device Firmware

From the **Management** menu Item, select the **Nodes Upgrade** item:



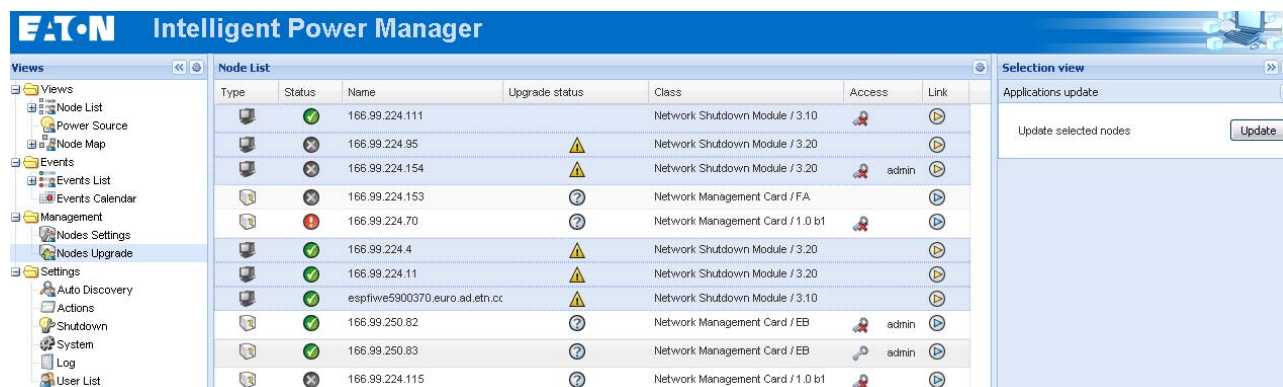
Perform this procedure to upload a Device firmware:

- Select the cards in the List
- From the Node List button -> **Set Login Parameters**, enter the card Login and Password
The access status changes from: **Access Denied** to **Access OK**
- From the **Firmware** -> **Import Firmware File...** list box; the uploading window appears.
 > Click **Browse ...** to select the firmware from a disk accessible from the computer.
 > Click **Import**.
- Click on **Firmware** -> **Upload Firmware to nodes**




- The cards will be updated with the firmware selected.

6.2.2 Upgrade applications

From the **Management** menu Item, select the **Nodes Upgrade** item:







Perform this procedure to update the applications:












- Select the applications in the **Node List**
- from the Node List button  -> **Set Login Parameters**, enter the access Login and Password
The access status changes from: **Access Denied**  to **Access OK** 
- From the **Applications update** panel, click on **Update**
- The status of the Applications with respect to the version is updated.

7 Compatibility List

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

7.1 Eaton Devices

Eaton equipment designation	Type	Features	Illustration
Network Management Card Minislot SNMP/Web – 66102 And associated Environment Sensor	UPS Option Card Eaton Pulsar	Quick Scan Supervision Management Shutdown	
Network Management Card & Modbus/JBus – 66103 (through Ethernet Network) And associated Environment Sensor 66846	UPS Option Card Eaton Pulsar	Quick Scan Supervision Management Shutdown	
ConnectUPS- Minislot Network Management Card / ref 103006826	UPS Option Card Eaton Powerware	Quick Scan Supervision Management Shutdown	
ConnectUPS-BD Web /SNMP	UPS Option Card Eaton Powerware	Quick Scan Supervision	

ConnectUPS-XSlot Web /SNMP/xHubCard (*)	UPS Option Card Eaton Powerware	Quick Scan Supervision	
PXGX2000 (*)	UPS Option Card Eaton Powerware	Quick Scan Supervision	
Eaton ePDU Monitored & Advanced Monitored	PDU Integrated Communication Card	Supervision	
Eaton ePDU Managed	PDU Integrated Communication Card	Supervision	
Eaton ePDU Switched	PDU Integrated Communication Card	Supervision	
MGE Switched PDU NM - 68130 / 68134/56132/56134/56136/56138 MGE AmpMeter PDU NM - 68152/ 56134/56144	PDU Integrated Communication Card	Supervision	
MGE Midspan NM - 66892	Midspan Integrated Communication Card	Supervision	
MGE Network Management Proxy(Windows) XML-Agent	UPS Proxy	Supervision	
Computers (Windows) hosting the application Lansafe Web View	UPS Proxy	Supervision	
MGE Network Management Card Minislot SNMP/Web – 66244 And associated Environment Sensor	UPS Option Card (legacy)	Supervision	
Network Management Card Transverse SNMP/Web – 66074 And associated Environment Sensor	UPS Option Card (Legacy)	Supervision	


(*)With Intelligent Power Manager 1.00, the Eaton Powerware 3 phase UPSs compatibility is available as a **Beta** release.

With Intelligent Power Manager 1.10, the Eaton Powerware 3 phase UPSs compatibility is officially available according to the following solution:



- **Cards:** ConnectUPS-X v4.30 or PXGX2000 v1.20
- **UPSs:** Blade UPS, PW9155 Dual Phase, PW9355 10-30 kVA, PW9390 40-160kVA, PW9395 225-1100kVA & SBM
- **Known limitation:** PW9315 will not be supported by this 1.10 release.

Note: Intelligent Power Manager 1.10 is available free of charge through Automatic Update Process

7.2 Applications on Computers

Applications designation	Features	
Computers (Windows/Linux/Mac) hosting the application Network Shutdown Module V3.xx	Quick Scan Supervision Management	

7.3 Other Devices

Equipment designation	Card/ proxy	Features	
APC UPSs	APC Network Management Card	Supervision	
All IETF MIB enabled UPSs (RFC1628) e.g. Liebert, ...		Supervision	STANDARD IETF UPS MIB 1.3.6.1.2.1.33.xx
PowerDsine series 6000	Card		
Servotech sentry models	PDU Integrated Communication Card		

7.4 Performances

To provide a performance evaluation Eaton has tested the following two configurations:

Test with Machine 1 (server Dell PowerEdge 2900)

- CPU: Intel Xeon 5130 Dual Core @2GHz
- Memory: 2Go DDR2 @666MHz
- HDD: 2 HDDs 67GB 7200 rpm RAID 0 (Mirroring)
- OS: Windows Server 2008 64 bits

Test conditions during 40 hours:

- 1300 nodes (including ~50 real), mainly IPMs, and some NSM and NMC.
- Average CPU load: 20~30%
- Memory load: 200~300MB

Test with Machine 2 (typical PC)

- CPU : Intel Core2 Duo 6600 @2.4GHz
- Memory: 2Go DDR2
- HDD: 1 HDD 220 GB 7200 rpm
- OS : Windows Vista Enterprise 32 bits

Test conditions during 40 hours:

- 1000 nodes (including ~50 real), mainly IPMs, and some NSM and NMC.

- Average CPU load: ~ 60%
- Memory load: 200~300MB

Note that these tests have been performed on Windows server Operating System. The Windows 2003 or 2008 Operating Systems don't have the limitation of 10 simultaneous connections.

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 IPM>:4680/

or

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

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).

Network Management Proxy

Network Management Proxy is used to control a UPS and connect it to the TCP/IP network.

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.

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Spider Monkey

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