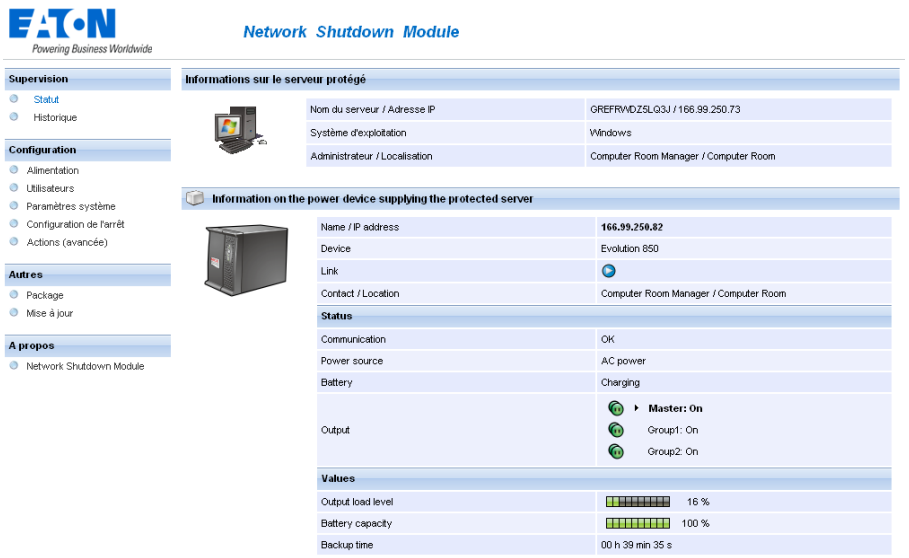
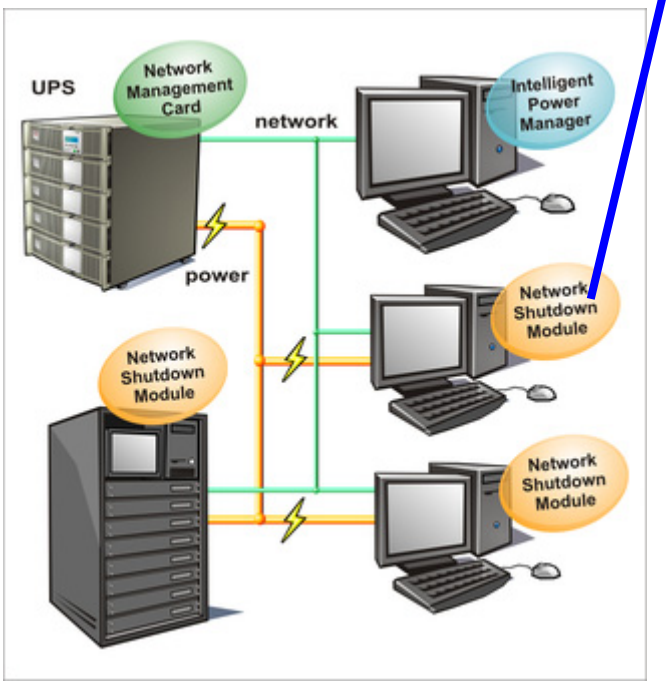
Network Shutdown Module V3

User Manual





Powering Business Worldwide

Network Shutdown Module V3

User Manual

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1 Introduction to the EATON's Network Solution

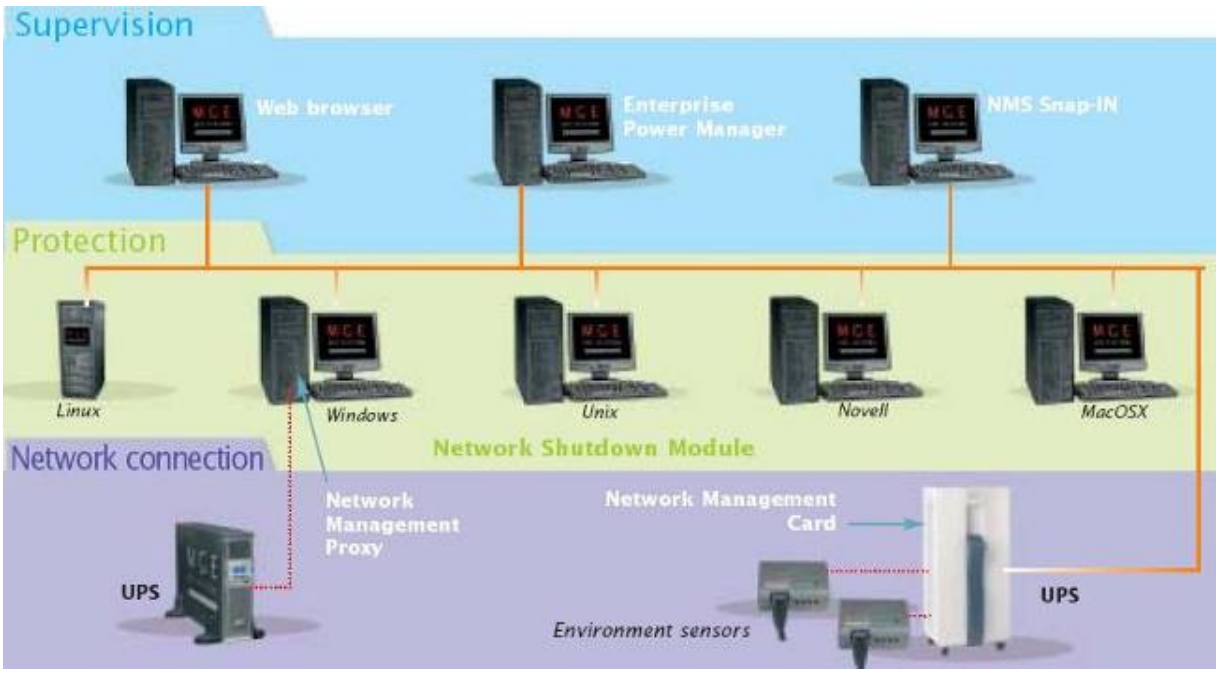
1.1 Overview

EATON's Network Solution:

- provides information on events concerning the supply of power to the computers connected to your computer network,
- carries out automatic shutdown of computer systems,
- monitors and controls all the UPSs connected to the network.

As illustrated in the picture below, EATON Network Solution provides these 3 main functions:

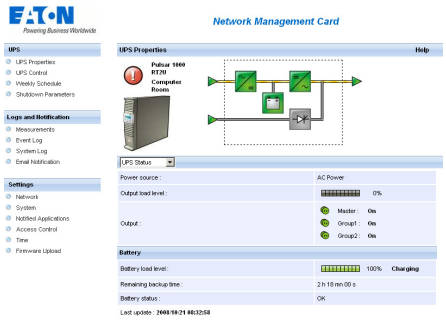
- **supervising** the UPSs over the Network,
- **protecting** the computers,
- **connecting** the UPS to the Network.



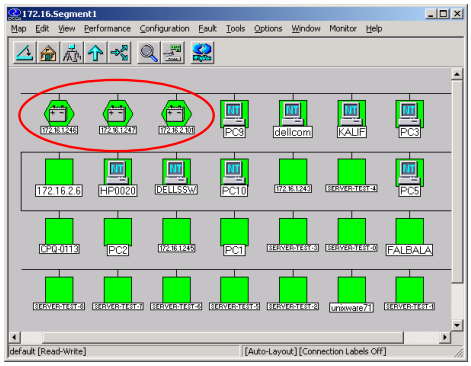
The functions of EATON's Network offering

1.2 Monitoring the UPSs over the network

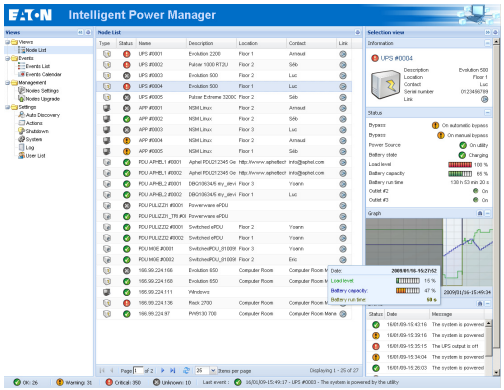
Depending on your needs, you can either use:



your Internet browser to monitor each UPS, as **Management Proxy**, **Management Card and Shutdown Module** include a Web server.



your company's standard Network Management System:
> HP-Openview,
> CA Unicenter,
> HP Insight Manager,
> IBM Tivoli Netview,
> …
To simplify integration of EATON UPSs with these NMS, you can use one of the Network Management System Kits for EATON devices. These kits are available on Management Pac 2 CD-Rom (ref 66923).



the EATON supervisor "Intelligent Power Manager"

1.3 Protecting the computers / servers

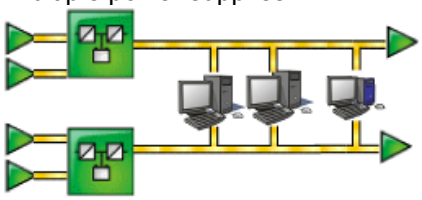
The Network Shutdown Module installed on each of the servers to be protected performs this function. Note that the Shutdown Module is available on several Operating Systems.

The Shutdown modules:
- continuously wait for information from the Mgt. Proxy or Mgt. Card connected to the EATON UPS.
- warns administrators and users if AC power fails and proceeds with graceful system shutdown before the end of battery backup power is reached.

New functions:
The Network Shutdown Module V 3.20 offers the **"mass configuration" advanced management feature** through Enterprise Power Manager 2.20.

The version V3 of the Network Shutdown Module:
- offers a remote supervision interface through any web browser (with a secured SSL/HTTPS connection enabled by default),

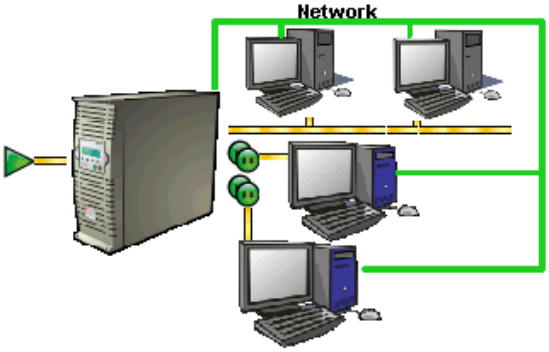
- manages multi UPS redundant configurations (see "Multi-UPS systems" chapter)
- Several UPSs in parallel
  - > 2 UPSs in Hot standby (or serial) redundancy
  - > 2 redundant UPSs through Static Transfer Switch
  - > UPSs powering a server with multiple power supplies



UPSs powering servers with multiple power supplies

- manages switchable outlets

With this version you can trigger shutdown sequences with switchable outlets.



A UPS that powers servers with load-shedding function

1.4 Connecting the UPS

1.4.1 Connecting to the Network

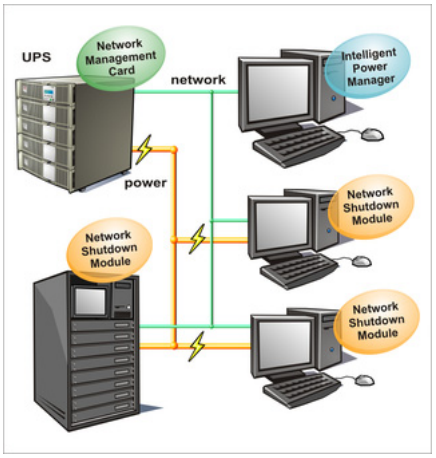
This function can be performed either through network Cards inserted in the UPS (**Network Management Card**) or through a software “agent” running on a nearby PC that is called the **Network Management Proxy**. Note that the Network Management Proxy is available only on Windows.

The Network Management Card or Proxy:

- manages communication with the UPS (as well as local protection of the machine on which Proxy is installed),
- periodically accesses the information concerning the UPS,
- makes this information available to the connected applications (Network Shutdown Modules, Web Browser, Network Management Systems, Enterprise Power Manager)

1.4.2 Select Network Architecture

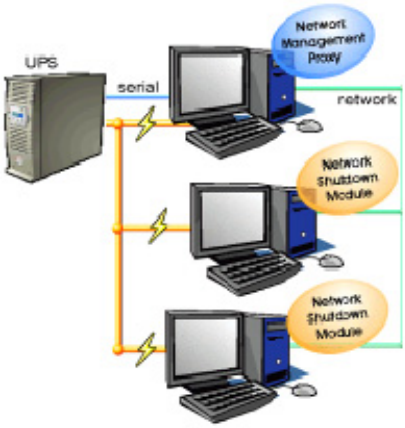
Below are two software and hardware architectures showing how EATON UPSs can protect several computers. These typical examples are intended to assist you in designing your own architecture.



Connection with Network Management Card

On the diagram above, the following two types of connections are required:

- the electrical power cables,
- the TCP/IP communication network.



Connection with Network Management Proxy

On the diagram above, three types of connections are required:
- a point-to-point link (serial or USB),
- the electrical power cables,
- the TCP/IP communication network.

1.4.3 Network Performances

The **Network Management Card** is designed to support a maximum of:
- 35 Network Shutdown Module connections in standard secure mode
- 100 connections with NSM 3.10 min. and NMC 66102/DA min. in UDP mode

Network Management Proxy, installed on a dedicated server, with at least 500 MB of Ram and a 1 GHz CPU, is designed to support a maximum of:
- 250 Network Shutdown Module connections in standard secure mode.

2 Installation

Note: This user manual only applies to Network Shutdown Module V3. For previous versions of Network Shutdown Module V2.x, please read the HTML on line manual.

2.1 Hardware Pre-requisites (Electrical and Network Connections)

Connection steps

Before connecting the UPS, you must first decide on a software and hardware architecture.
Before installing the EATON Network Solution, the UPS must be set up as indicated in the steps below.

- Shut down the computers to be protected by the UPS.
- Connect the UPS to a wall outlet. (For UPSs above 3kVA, please refer to the UPS installation manual).
- Connect the power cord of each computer to an outlet on the UPS. (For UPSs above 3kVA, please refer to the UPS installation manual).
- How to connect UPS / proxy or card / network:
  - > If the Mgt. Proxy is used, connect the serial or USB port on the computer and on the UPS.
  - > If a Network Management Card is used, insert the optional card in the UPS and connect the UPS to the computer network.
- Start the EATON UPS, then the computers.
- Setting up the protection
  - > If the Mgt. Proxy is used install it on the one machine directly connected to the UPS.
  - > If a Network Management Card is used, it must be set up (see the Mgt. Card's user manual).
- Install Network Shutdown Module on all the other machines that are to be protected by the UPS (supplied with UPS battery backup power).
  Note: The Mgt. Proxy manages protection of the machine on which it is installed.

2.2 Software Installation Pre-requisites

2.2.1 On the System Hosting « Network Shutdown Module V3 »

2.2.1.1 Windows Compatibilities:

Network Shutdown Module V3 Windows is compatible and has been tested with:

- Windows (x86) 2000 / XP (Home or Pro) / 2003 / Vista (Business or Ultimate) / 2008 (Web Server, Standard, Entreprise, Data Center) / Windows 7
  Server 2003 Appliance Edition (Tested on Iomega NAS Server)

- Windows (Xeon 64) Windows Server 2003 Standard x64 Edition
  Windows Server 2008 Enterprise x64 Edition
  Windows 7
  Windows Vista Business x64

- Windows (AMD Opteron) IBM blade server AMD Opteron single processor for LS20 (type 8850)
  Windows Server 2003

- Windows (Intel Xeon) IBM blade server Intel Xeon single processor for HS20 (type 8843)
  Windows Server 2003

2.2.1.2 Linux Compatibilities:

Network Shutdown Module V3 Linux is compatible and has been tested with:

- Linux (x86/x86_64)

Debian GNU Linux:	Etch, Lenny
SUSE/Novell:	SLES 11, OpenSUSE 10.3, 11.2,
Redhat Enterprise Linux:	RHEL 5.4, Fedore core 12
Ubuntu:	9.04, 9.10
VMWare:	ESX3, 3.5, ESXi4 (NSM CLI installer)
Mandriva	2009, 2010

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.

The following list is not exhaustive. Network Shutdown Module V3 **should be** compatible with:

- Linux (x86/x86_64)

Debian GNU Linux:	Testing,
SUSE/Novell:	SLES 10, openSUSE 10.x, 11.x
Redhat Enterprise Linux:	RHEL 4, 5 , Fedora core 10,11
Ubuntu:	7.10, 8.04, 8.04 LTS Server, 8.10
Others:	IPCop, …

2.2.1.3 Mac Compatibilities:

Network Shutdown Module V3 Mac OSX is compatible and has been tested with:

- Mac Intel Mac OS X 10.4, 10.5, 10.6
- Mac PowerPC Mac OS X 10.4, 10.5

2.2.1.4 Standby configuration (Windows):

In Configuration Panel -> Power Option properties:

- You must unselect the Standby configuration of your Operating System to be compliant with the Network Shutdown Module. With the standby configuration checked your system is not protected.
- If you want to save energy, please prefer the hibernate feature.

2.2.1.5 Broadcast Message configuration (Windows):

If the "Broadcast administrator messages / Broadcast user messages " function is activated, on Network Shutdown Module, you have to check that the "Messenger" Service is started.
This service is mandatory to use the broadcast messages on Windows.

2.2.1.6 Firewall configuration (Windows & Linux) and Gateway :

(Optional) To enable a remote access for supervision and configuration you will have to open the following UDP and TCP ports of the Windows Firewall:

- **4679** EATON Supervision
- **4680** EATON Management (access through SSL)

These ports are reserved for EATON at IANA (Internet Assigned Numbers Authority, http://www.iana.org/).

If you use Windows, the ports are automatically opened in the Windows Firewall.

If you use a Firewall with all ports closed by default:
To enable communication between Network Shutdown Module and Network Management Card:

- Port 80 must be opened as a destination port (for output) on the machine hosting Network Shutdown Module.

If you use a Gateway without predefined routed port:
To enable communication between Network Shutdown Module and Network Management Card:

- Ensure to route 4679 and 4680 ports with the protocol «TCP»&«UDP».

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

Important:
The Network Shutdown Module graphical interface can be accessed remotely using a simple Web browser. Access to this interface is secured through SSL connection (default configuration) and **must** also be secured through Login & password.

The Network Shutdown Module graphical interface has been tested with:

- Mozilla Firefox (1.5, 2.0, 3.0) is recommended for better performance. (**Firefox is mandatory for Linux**)
- Microsoft Internet Explorer V6, V7, V8
- Safari

Note: For the Web browser, we advise you against the use of the highest security level. Some configuration screens are not useable.
Javascript and Cookies must be authorized for the selected security level.

2.3 Quick Start

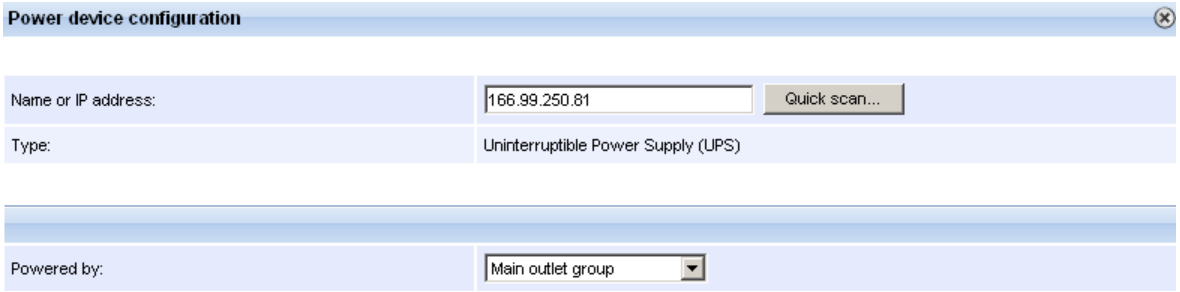
To install the Network Shutdown Module in 5 minutes, please perform the following steps on a machine running Windows 2000 / XP / 2003 / 2008 / Vista / 7, Linux or Mac OSX:

- **Step 1** (Pre-requisites)
  Check that following connections are operational:
  > the electrical connection between the UPS and the server to protect
  > the network connection between the UPS and the Network Management Card (or Proxy).

- **Step 2** (Optional)
  To enable the configuration and supervision remote access, Network Shutdown Module needs the 4679 and 4680 ports (UDP/TCP) to be opened in the Firewall (Automatically opened in the Windows Firewall).

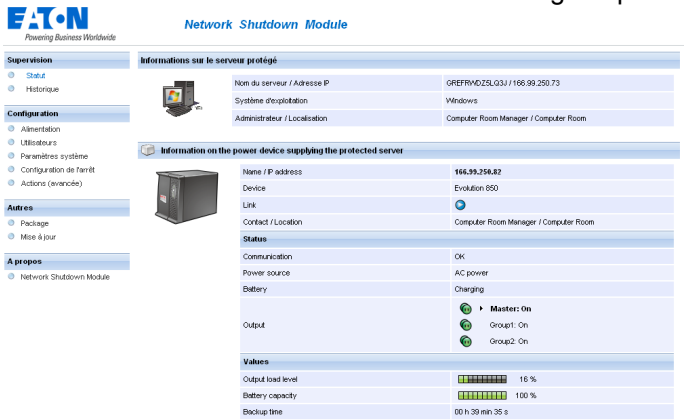
- **Step 3** (Software Installation)
  On a Windows 2000 / XP / 2003 / 2008 / Vista / 7, Linux or Mac OSX machine, execute the “Network Shutdown Module” package under an administrator account.

- **Step 4** (Configuration)
  > In the **Configuration->Power devices** screen,
  Enter the default Login «admin» and default Password «admin»
  Then click on the **Add** button and
  > Enter the IP (or the host name) of the Network Management Card (or Proxy)
  or use the following new function:
  New: With the Quick Scan … button, available with version 3.10 and later, you can discover in a few seconds the cards connected to the network and then select a card from the list.



  > **Save** your configuration
  >In the **Configuration->Users** window configure your password (recommended)
  > For the multi-UPS configurations, please refer to chapter 6

- **Step 5** (Operation)
  You can now supervise the UPS state and the information concerning the protected server



2.4 Software Installation Procedure

This section informs on how to install Network Shutdown Module to protect the computer system.

Before starting the installation:
- it is necessary first to install a Network Management Card in the UPS or the Mgt. Proxy on a server.
- make sure you have the necessary administrator rights to install Network Shutdown Module (for Windows and Linux).
- it is assumed that you are aware of the installation prerequisites.

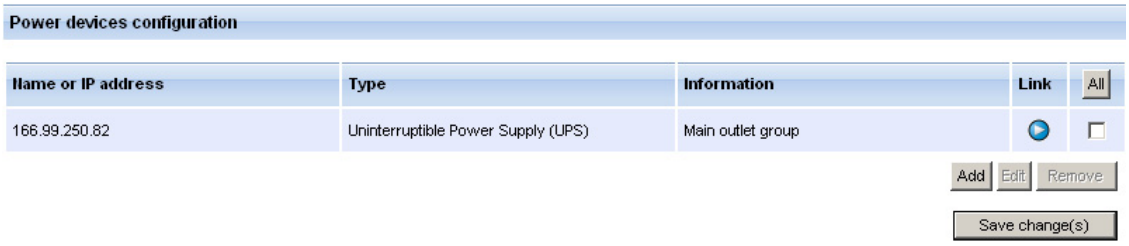
Follow these steps to install Network Shutdown Module in interactive (graphical) mode:

Connect to the EATON download area. Follow the instructions to download Network Shutdown Module or insert the Solution-Pac 2 CD-ROM (/HF).

For Windows:	From CD ROM: • At the first navigator screen select "Network Solutions" and follow the instructions
	From the Web: • Execute the downloaded package.
For Linux:	From CD ROM: • Mount your CD-ROM (ex: /mnt/cdrom) • Open Default.htm from your internet browser to discover the solutions and select "Network Solutions". • Follow the instructions
	From the web: • Download and save the file to your computer. • Authorize the execution right on the downloaded package (through graphical interface) or execute the command : `chmod 755 nsm_linux_xx_3_xx_xx.run` • To install execute the package (double click) • If necessary enter the root password • Follow the instructions
For Mac OSX	From the Web: • Execute the downloaded package.

- Choose the installation language. The selected language will correspond to the one of the installed product.
- Read and accept the License Agreement for EATON Software.
- Choose the installation directory of the Network Shutdown Module.
  > Windows default value is C:\Program Files\EATON\NetworkShutdownModule
  > Linux default value is /usr/local/EATON/NetworkShutdownModule
  > Mac OSX default value is /usr/local/EATON/NetworkShutdownModule
- Complete the installation.

After the installation,
> In the **Configuration-> Power device** screen,
Enter the default Login «admin» and default Password «admin»
Then click on the **Add** button and
> Enter the IP (or the host name) of the Network Management Card (or Proxy)
or use the following new function:
New: With the Quick Scan … button, available with version 3.10 and later, you can discover in a few seconds the cards connected to the network and then select a card from the list.



Power device settings

> **Save** your configuration

- Configure your password (recommended)
- For multi-UPS systems, please refer to the chapter "Multi UPS systems" .
- The Network Shutdown Module is now configured by default. You can anyway customize the Network Shutdown Module and for example configure your password (recommended).
- The installed components are automatically started.
- It is possible to test Network Shutdown Module.
- The protection function is now active on the computer and will be run automatically each time the computer is started.

Follow these steps to install Network Shutdown Module in console mode:

- For Linux, if the server doesn't have the graphical layer installed, you have to use the specific package called nsm_linux-cli_xxx.run
- Login as root in a terminal
- Then install the Network Shutdown Module in silent mode

Note : You can configure the Network Shutdown Module either:

- through the silent mode parameters (e.g.)

./<FileName> -install –silent –agentName '172.17.1.2'

- through remote access

2.5 Application deployment and silent installation (advanced)

After customizing the Network Shutdown Module configuration (name or IP address of Network Management Card/Proxy, events and actions, etc.), you can build a Network Shutdown Module installation package that contains your specific configuration.

You can then deploy this Network Shutdown Module configuration on other machines that have the same operating system.

Network Shutdown Module application deployment

Refer to the appendix "Application deployment and silent installation"

2.6 Uninstalling the Network Shutdown Module

Windows:	• The shortcut **EATON -> Network Shutdown Module->Uninstall** is used to uninstall Network Shutdown Module. or • In the **Control panel**, you can also run the **Add/remove programs** command and select the Network Shutdown Module program.
Linux:	• The KDE shortcut **K:-> EATON -> Network Shutdown Module->Uninstall** is used to uninstall Network Shutdown Module. • The Gnome shortcut **Applications-> EATON -> Network Shutdown Module->Uninstall** is used to uninstall Network Shutdown Module. • In console mode, you can execute <Installation directory>/packaging/nsmInstaller –uninstall <Installation directory> default value is /usr/local/EATON/NetworkShutdownModule/
Mac OSX:	• The shortcut **Applications -> Utilities -> EATON -> Network Shutdown Module->Uninstall.command** is used to uninstall Network Shutdown Module.

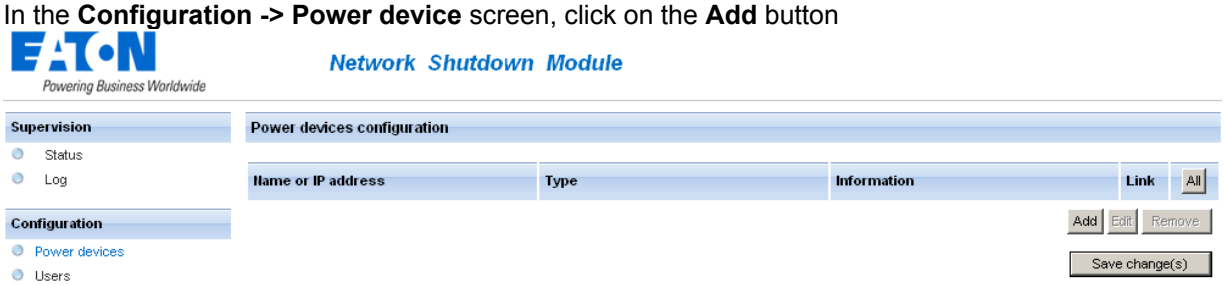
3 Minimal configuration steps

3.1 Introduction

In this chapter we describe the basic and minimal configuration steps that must be performed before using the Network Shutdown Module.
The other and optional configuration possibilities are described later.

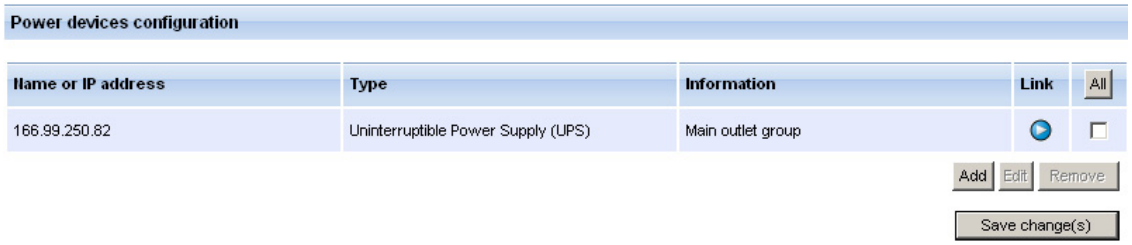
3.2 The IP address of the UPS that powers your server.

In the **Configuration -> Power device** screen, click on the **Add** button



Adding a power device

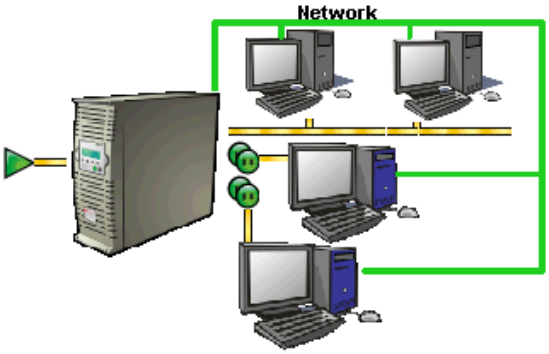
Then following screen appears:
> Enter the IP (or the host name) of the Network Management Card (or Proxy)
or use the following new function:
New: With the Quick Scan … button, available with version 3.10 and later, you can discover in a few seconds the cards connected to the network and then select a card from the list.



Power device settings

From this screen, you can define the following parameters:
- Network Name or IP address of the Network Management Card / Proxy. This parameter must correspond to the UPS that powers your machine.
- The UPS Outlet that powers the server

Powershare outlets and load shedding:
You have the possibility in this page to configure the electrical dependency between one of the UPS switchable plugs and the server hosting Network Shutdown Module.
This function is useful for the servers that must be first shut down during the autonomy sequence.



Load shedding configuration on UPS powershare outlets

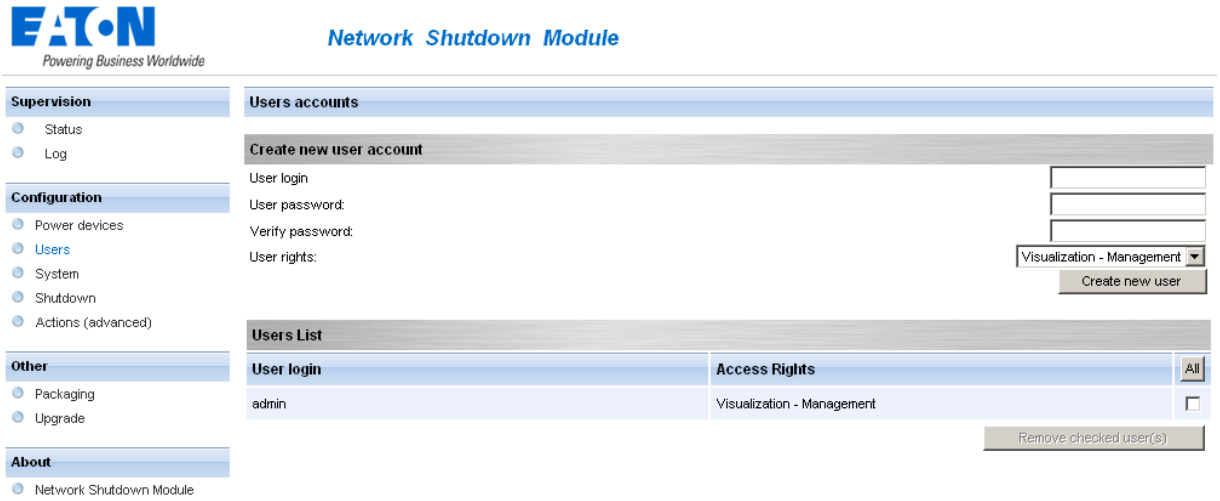
Remark:
This load shedding function is not available if the UPS doesn't have any switchable outlet.

Note:
For multi-UPS configurations, you have the possibility to enter several names or IP addresses (using the [Add] button). For these advanced configurations, please refer to the Chapter « Multi – UPS systems ».

3.3 Users accounts configuration

Click on the **Users** item of the **Configuration** section on the left menu.

The default Login «admin» and default Password «admin» with Visualization – Management rights.
Note: For security reasons we advise you to remove this default login and to create a new login with new access password.



User accounts configuration

You can configure several user accounts.

To add a user account:
- enter the **User Login** and the **User password (twice)**,
- select the **User's Rights** level. The following levels are available:
  Visualization – Management (the user will be able to access all the sections)
  Visualization (the user will only access to the **Supervision (*)** and the **About** sections)
- click on the **Create new user** button

(*) Remove logs function in UPS logs panel is only functional with **Visualization – Management** user's right.

4 Use

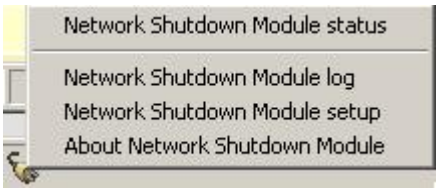
4.1 Monitoring the server and the UPS(s)

4.1.1 Local access

From the system where the Network Shutdown Module is installed,

- You can use the following shortcut:
  For Windows: Start -> Programs -> EATON -> Network Shutdown Module -> Supervision
  For Linux (KDE): K-> EATON -> Network Shutdown Module -> Supervision
  For Linux (Gnome): Applications -> EATON -> Network Shutdown Module -> Supervision
  For Mac OSX: Applications -> Utilities -> EATON -> Network Shutdown Module->Supervision.command

- You can also use the icon in the task bar:



To access to this interface:
- Double-click on the icon or
- Right click the icon in the task bar to access to the item "Network Shutdown module Status"

4.1.2 Remote access

- From a remote machine, you can type the following URL in a Web browser for
  > secured SSL access:
  https://< name or IP address of computer hosting NSM>:4680/
  > or for non secured access:
  http://< name or IP address of computer hosting NSM>:4679/

  Note: The Web server is "case sensitive" for the URL.

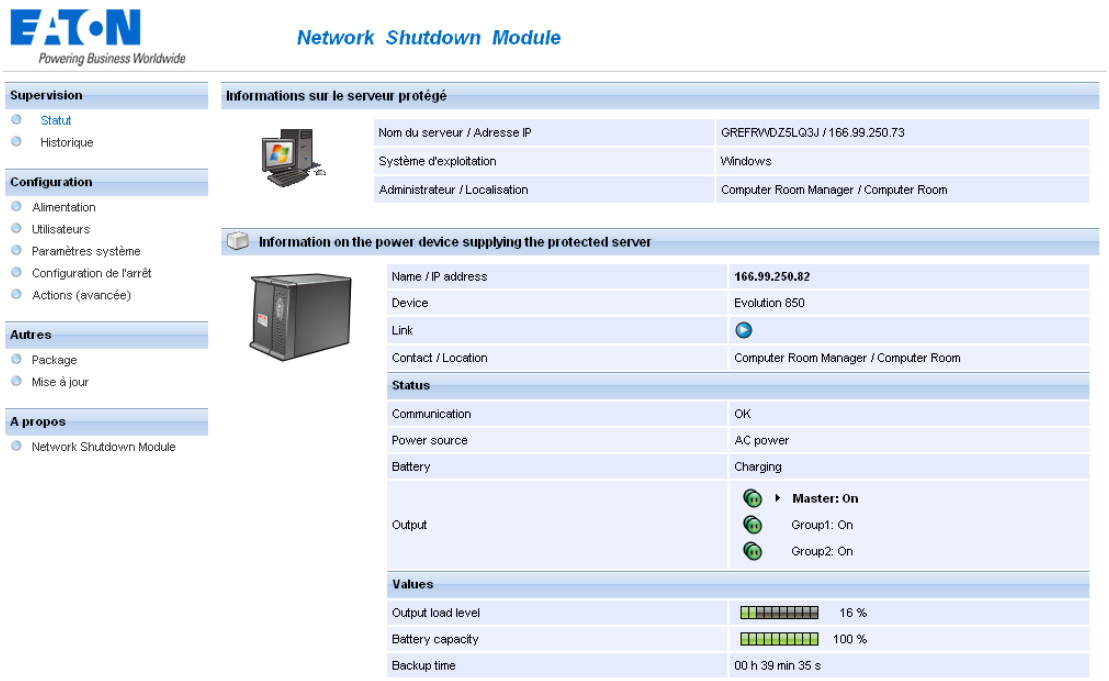
- Accept the SSL Certificate (by clicking on Yes)

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 NSM site.
> Click through the certificate error
> Click the "Certificate Error" button in the address bar.
> Click View Certificate
> Click Install Certificate
> Unlike on XP, you must 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 (optional)
- The following page appears:



Server and UPS supervision

Section « Information on the protected server»

- Server name / IP address:
  The Network name of the machine hosting the Network Shutdown Module and its IP address.
- Operating system:
  The operating system of the machine hosting the Network Shutdown Module.
- Contact / Location:
  The location of the machine hosting the Network Shutdown Module
  the contact person for the machine hosting the Network Shutdown Module.
  These values can be configured in the System page.

Section concerning the UPS that powers the protected server

- This icon represents the status of the power device. It can have following values: Critical/Alert/Normal
- Name/ IP address: The Network name (or IP address) of the device.
- Device: The commercial product name.
- Link: Link to the device Web site (if available).
- Contact / Location: The device contact. (value of syscontact object or can also be configured in the Device page).
  The device location. (value of syslocation object or can also be configured in the Device page).

Status

- Communication: Device communication status (OK / Network Communication Failure / device Communication Failure).
- Power source: AC Power / Battery.

- Battery: Charging / Discharging / Battery fault.
- Output: Main output status (ON/OFF/Internal Failure/On Automatic Bypass/Manual By Pass/Overload).
  Or output outlet status (ON/OFF).
  The outlet group that powers the device is highlighted in bold

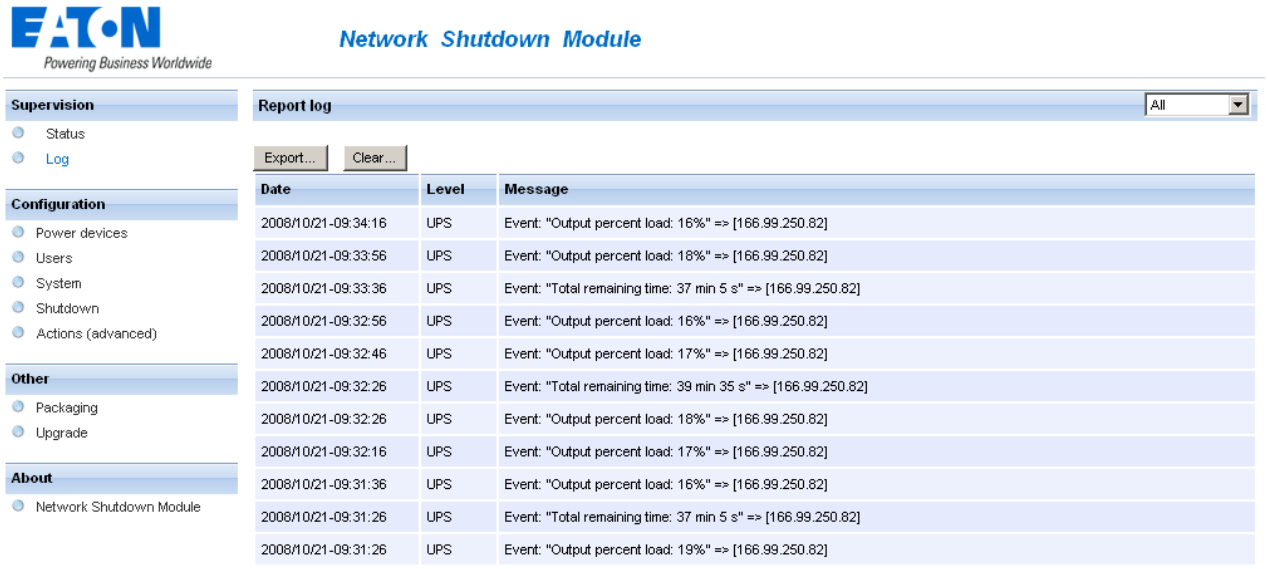
Values

- Output Load Level: The output load level of the device.
- Battery capacity: Battery capacity of the device.
- Backup time: The device remaining backup time.

Note that this view is impacted when any device status is affected.

4.2 System and UPS event log

In the **Supervision** section, Select the **Log** item, and the following page appears:



Network Shutdown Module event Log

Use the filter in the top right to choose the data to display:

- **All**: Displays all the logs.
- **UPS logs**: Only displays the UPS events.
- **System logs**: Only displays the System events.

- Use the **Export …** button to record the displayed data into a CSV file.
- Use the **Clear…** button to clear the displayed data.

4.3 UPS Events list

The icons in the Status view represent the event severity.

Icon	Event status
	Normal. With this event, the device is coming back to a normal status. **Event list:** • Communication with "Management Card / Proxy" is restored. • 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. • Outlet group 1 is on. • Outlet group 2 is on. • Protection lost

- Redundancy lost (for multi-UPS systems)

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

Event list:

- The system is powered by the UPS battery.
- Output on automatic bypass.
- Output on manual bypass.
- Protection lost
- Redundancy lost (for multi-UPS systems)

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

Event list:

- UPS output is off.
- Battery fault.
- UPS overload.
- UPS fault.
- Low battery alarm.
- System shutdown in progress...
- Outlet group 1 is off.
- Outlet group 2 is off.

Communication lost between the Card/Proxy agent and the **Network Shutdown Module**.

Or **communication lost** between the device and the Card/Proxy.

Event list:

- Communication with "Management Card / Proxy" has failed (Warning).
- Communication failure with UPS (Warning).

4.4 Test the communication with the UPS

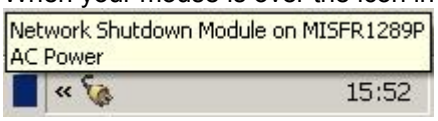
After the installation, it is important to check that Network Shutdown Module communicates with the agent (Mgt. Proxy or the Network Management Card).

4.4.1 Simple Tests

Test 1:
When Network Shutdown Module starts, an icon is displayed by default in the task bar, if you're running Windows or Linux (Gnome or KDE). It can indicate one of the following status conditions:

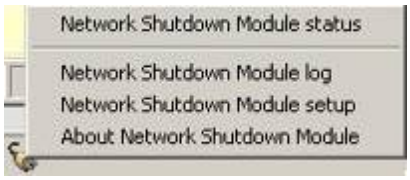
Icon	Description	Meaning
	AC power	**The installation is in correct running order**.
	Utility failure / load on battery	Check the power cable for the UPS. Note that this is the normal display if the AC-input power has failed.
	Communication failure	Wait an instant, then check the communication parameters between the computer and the Cards/Proxy.
	The Acquisition Engine is stopped	Check in the services list that the service is started.
	Battery fault	Contact the EATON support department or your dealer to check battery connections or replace worn batteries.

Remark:
When your mouse is over the icon in the taskbar a summary status is displayed:



Test 2:

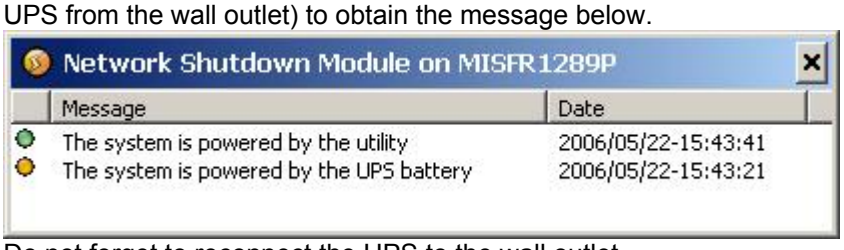
- You can view the Network Shutdown Module HTML supervision interface and then check that the UPS has been recognized and that the communication status is OK.



To access to this interface:

- Double-click on the icon or
- Right click the icon in the task bar to access to access to the item "Network Shutdown module Status"

Test 3:
Where possible, another procedure is to generate an event such as a loss of AC power (by disconnecting the UPS from the wall outlet) to obtain the message below.



Do not forget to reconnect the UPS to the wall outlet.

4.4.2 Advanced tests

For test purpose, it is also possible to display the messages in verbose mode and check the content.

Messages in verbose mode:

- **Event log:**
  It is possible to consult the Event log.

- **Advanced trace:**
  We warn you against the use of disk space for this Trace mode.

  To validate verbose mode :
  > in the **bin/dae and bin/netsystray** directory of the application, rename the file called **debugMode.off** into **debugMode.on**,
  > restart the EATON Network Shutdown Module - Acquisition engine as explained hereafter,
  > view the trace in the file called **traceDebug.txt** in the same directory.

  To stop verbose mode :
  > in the **bin** directory of the application, rename the file called **debugMode.off** into **debugMode.on**,
  > restart the EATON Network Shutdown Module - Acquisition engine as explained hereafter.

4.5 Start and stop the Shutdown Module (advanced)

(**Warning**, if you stop, your computer is not protected anymore).

Windows:	From the Windows services panel you can start and stop the 2 services that are created: • EATON Network Shutdown Module - Acquisition engine • EATON Network Shutdown Module - Web server

Linux:	• In graphical mode, from your services panel you can start and stop the eaton-nsm service that is created.
	• In console mode, as root, you can also run the following commands:
	`/etc/init.d/eaton-nsm start`
	`/etc/init.d/eaton-nsm stop`
	`/etc/init.d/eaton-nsm restart`

Mac OSX:	• In console mode, as root, you can also run the following commands: /System/Library/StartupItems/NetworkShutdownModule/NetworkShutdownModule start /System/Library/StartupItems/NetworkShutdownModule/NetworkShutdownModule stop /System/Library/StartupItems/NetworkShutdownModule/NetworkShutdownModule restart

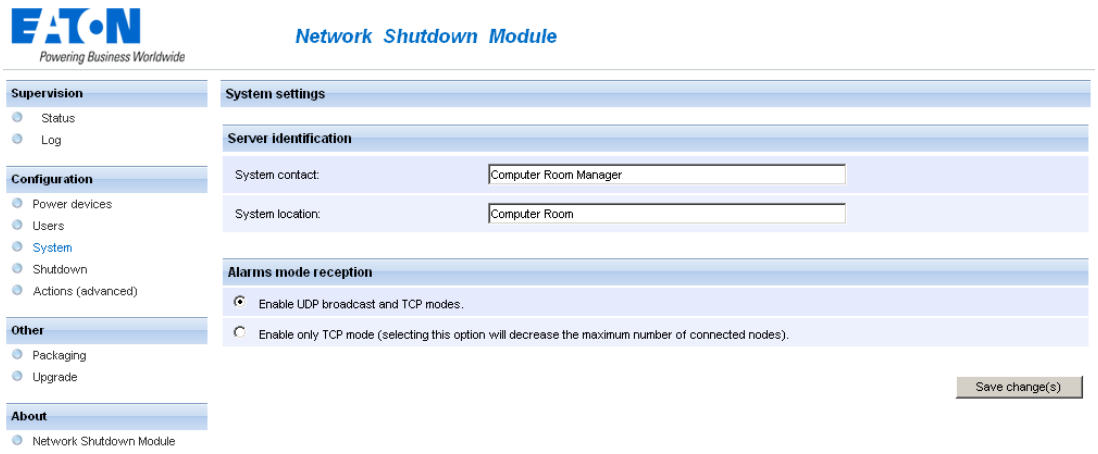
5 Other Configuration possibilities

5.1 Introduction

Basic configuration steps are described before (refer to Power devices and Users).
In this chapter we describe other configuration possibilities.

5.2 Configure system parameters

Click on the **System** item of the **Configuration** section on the left menu



System parameters configuration

This page lets you enter the system parameters for the application.

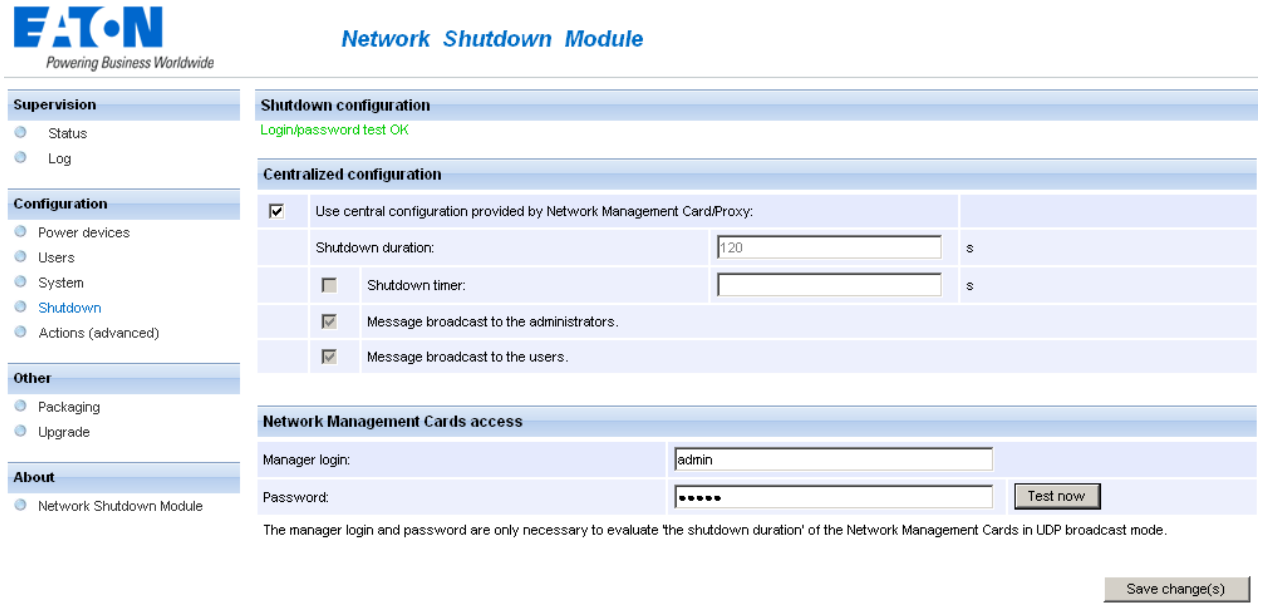
It contains:
- The system administrator name.
- The system localisation.

Note:
This information is visible in the **Supervision -> Status** page

Alarm reception mode
In this area, you can:
- Authorize UDP and TCP modes (default value)
  The Network Shutdown Module will thus determine automatically which mode is supported by the card and will give UDP mode priority because this can be used to support a greater number of Network Shutdown Modules per card.
- Authorize TCP mode only (selection of this option limits the maximum number of nodes connected).
  This configuration is useful if a piece of equipment likely to filter UDP broadcast network frames is present between the Network Shutdown Module and the card (for example, a router or a manageable switch configured specifically for filtering UDP frames)

Note:
With Mac OSX Power PC, you will have to restart the machine (or the services) to change the Alarm reception mode configuration

5.3 Shutdown Configuration



Shutdown Configuration page

From this screen, you can define the following parameters:

- **Use central configuration provided by Management Card/Proxy:**
  With this function, all the Network Shutdown Modules will obtain their configuration from the card (or proxy).
  In multi-UPS context, you can select the IP of the card/proxy from which you obtain the configuration

  If you unselect this option, you can modify for your computer the following parameters:

  - **Shutdown duration:**
    This is the time in seconds required by the system to go through its shutdown procedure.
    The Network Shutdown Modules transmit their own shutdown duration to the Card/proxy.
    The role of this parameter is illustrated by the example of shutdown sequence.
    > Possible values : 0 to 9999
    > Default value : 120
    > Unit : Second
    It is on the basis of these values (shutdown duration of all the systems) that the Card/proxy sends the delayed shutdown order to the UPS.

  - **Shutdown timer (Shutdown when timer reaches)**
    After AC power failure before initiating the system shutdown procedure, this is the time in seconds that the system waits.
    > Possible values : 0 to 999999
    > Default value : this criterion for system shutdown is **not enabled** by default
    > Unit : Second

    This value must be selected to provide users with enough time to close their applications and disconnect, but within the battery backup time provided by the UPS.
    See the UPS manual for information on the backup time.
    If another criterion occurs before the end of the shutdown timer, the shutdown procedure is immediately run.
    The role of this parameter is illustrated by the example of shutdown sequence.

Remark:
If the shutdown timer on a client is the criterion that trips the shutdown procedure, automatic restart of the client is not guaranteed (the case where AC power returns and only the client station is shut down).

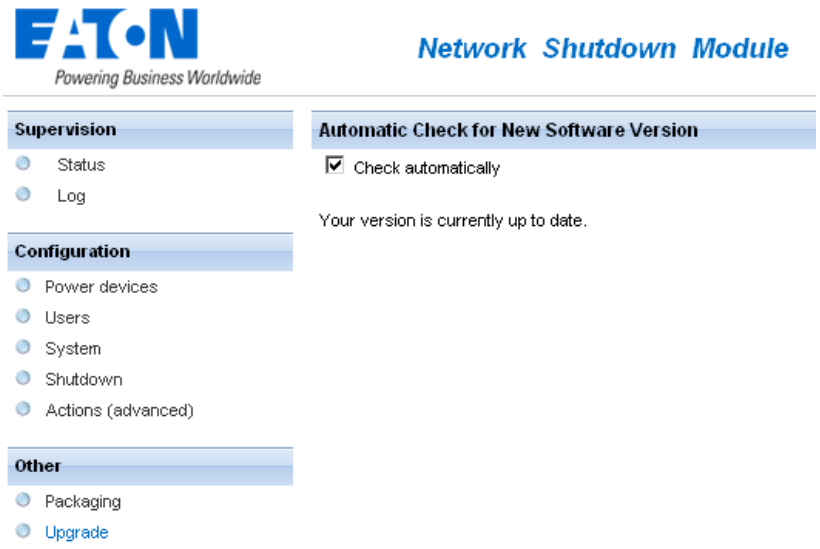
- **Message broadcast to the administrator**
  A message is sent over the network to administrators connected to the server protected by Network Shutdown Module.
  Check following Windows pre-requisite
  > Default value : activated

- **Message broadcast to users**
  A message is sent over the network to users connected to the server protected by Network Shutdown Module.
  Check following Windows pre-requisite
  > Default value : activated

- **Access to Network Management Cards**
  If you customize the « Shutdown duration » on your computer, the update mechanism in UDP broadcast mode for this value requires write access for the card. The « Manager login » and « Password » are thus required.

5.4 Checking for Upgrades

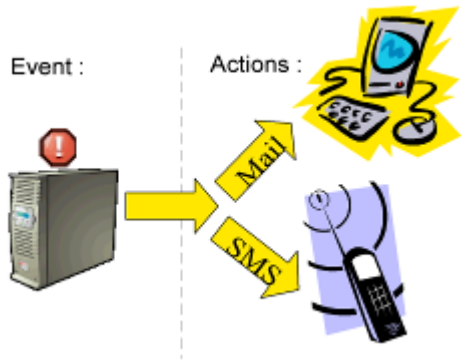
This function gives you access to EATON software updates.
Your Enterprise Power Manager will always be up to date if you select the **Check automatically** option.
When a new software version is detected, just follow the wizard instructions.
Note: This operation will preserve your database information.



Check for upgrade window

5.5 Events and actions (advanced configuration)

Basic principles:
Network Shutdown Module receives events (e.g. Utility Failure) from the UPS and in reply to these events executes actions (e.g. notification, e-mail, etc.).
The above interface allows links between events and actions to be configured, as well as customizing protection for the machine hosting Network Shutdown Module.



events / actions

This very powerful tool enables the Network Shutdown Module behaviour to be modified intuitively.

Modifying events and actions is only necessary if you require your protection module to operate in a particular way. The default configuration ensures optimal protection of your installation. Modifying parameters must therefore be done with care as it could compromise the protection of your installation.

This advanced settings is described in appendix

6 Multi-UPS Systems

6.1 Caution

Please check complete list of UPSs compatible with our Redundancy/Parallel mode service:

Caution:
We strongly recommend you contact trained EATON personnel for setup, in order to guarantee the integrity of your high-availability system.

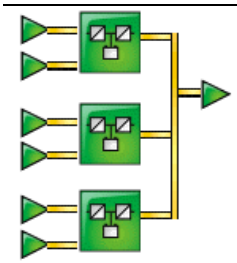
Recommendations:
- For the UPS Models it is better to Enable "Communication Shutoff orders" so that the UPS accepts Network Management Card off commands.
  Exception for 2 UPSs in Hot standby (Sequential redundancy).
- The Network Management Cards **MUST** have the same shutdown criteria parameters.
  You can use default settings (or duplicate configuration using specific tools like Mupgrade or …)
- For 3 phase UPS systems it is mandatory to check battery parameters before installing Network Shutdown Module.

6.2 Presentation

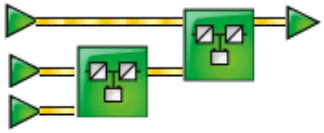
With the latest version V3 the Network Shutdown Module manages multi UPS redundant configurations.

The **Network Shutdown Module V3** makes it possible
- to supervise an installation made up of several UPSs. It provides the user with an overall view of the installation by concentrating the information acquired from the individual UPSs. The data acquisition is performed through the IP network.
- to trigger the shutdown of the machine on which it is installed, taking into account the consolidated « global » view of the electrical installation.

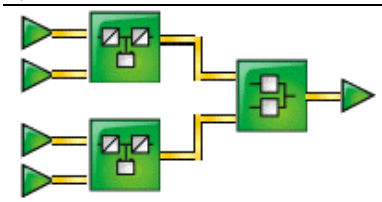
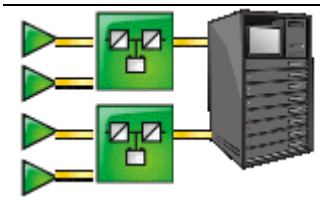
The **Network Shutdown Module V3** manages following electrical configurations:



- Several UPSs in parallel:



- 2 UPSs in Hot standby (Sequential redundancy):
  Note: For the UPS Model that is close to the load you have to disable "Communication Shutoff orders" so that the UPS transfers to bypass and doesn't accept Network Management Card off commands.
  (You can use the UPS display or the UPS Configuration tool)

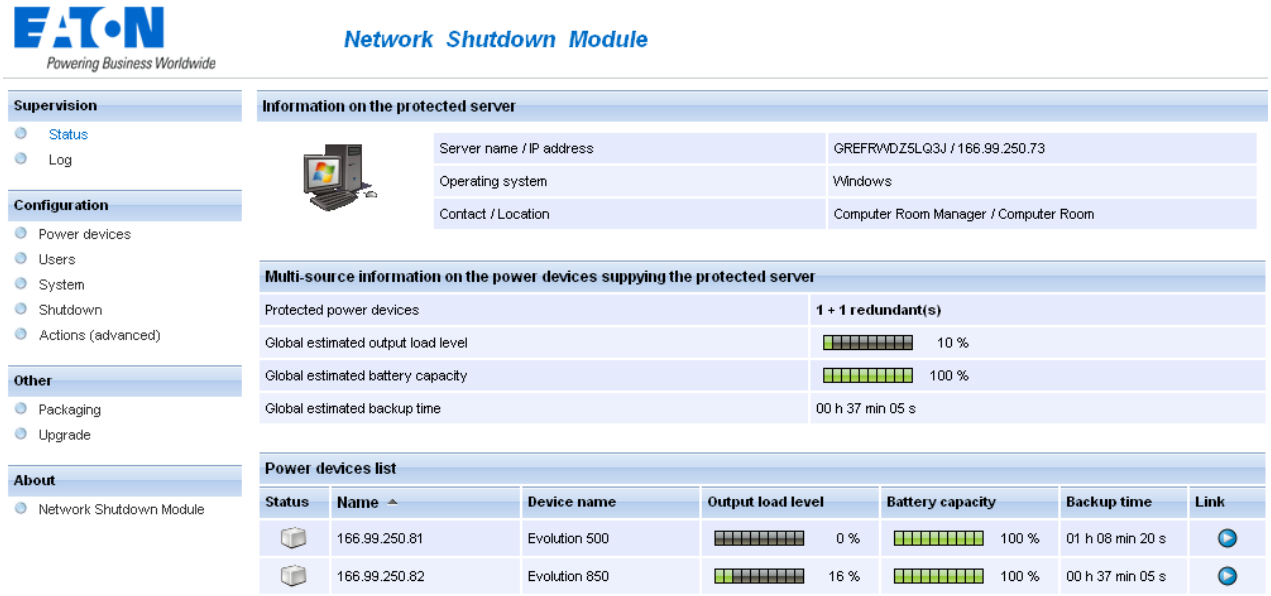
	• 2 UPSs in serial redundancy:
	• 2 unitary UPSs through Static Transfer Switch:
	• UPSs powering a server with multiple power supplies:

- Some simple combinations of these electrical associations are also supported by Network Shutdown module.
  Important: To know the list of multi-UPS configurations that are supported by the Network Shutdown Module, please refer to the appendix List of tested multi-UPS configurations.

The Network Shutdown module doesn't take into account the real electrical drawing. It computes dynamically the **minimal number of UPSs** below which the system has to be shut down.

This **minimal number of UPSs** is recomputed permanently according to the following parameters:
- the nominal load of each UPS
- the output load level of each UPS
- the UPS remaining backup time of each UPS

When several UPSs electrically power the computer hosting Network Shutdown Module, the main interface is as follows:



Server and multi-UPS supervision

Following information is displayed:

Information on the protected server section

- Server name / IP address:
  the Network name of the machine hosting the Network Shutdown Module and its IP address.
- Operating system:
  the Operating System name of the machine hosting the Network Shutdown Module.
- Contact / Location:
  the location of the machine hosting the Network Shutdown Module
  the contact person for the machine hosting the Network Shutdown Module.
  These values can be configured in the System page.

Multi-sources Information section:

- Power devices: **x** + **y** redundant(s)
  > the first value **x** is the **minimal number of UPSs** that is necessary to power the load.
  > the second value **y** is the **number of UPSs in redundancy**.
  > the addition of these 2 values is the **total number** of available UPSs.
- Global estimated load level: the output load level for the global installation.
- Global estimated battery capacity: the battery capacity for the global installation.
- Global estimated backup time: the remaining backup time for the global installation. This value takes into account UPS load balancing anticipation.

Power devices List section:

In this section you will find the information, concerning the UPSs that power the server hosting Network Shutdown Module:

The following UPS information is displayed in this page:

- Status this icon represents the severity of the monitored device;
- Name the Network name (if available) or the IP address
- Device name the EATON product name
- Output Load Level the output level of the device
- Battery Capacity the battery capacity of the device
- Backup Time the remaining backup time of the device
- Link link to the device Web site (if available)

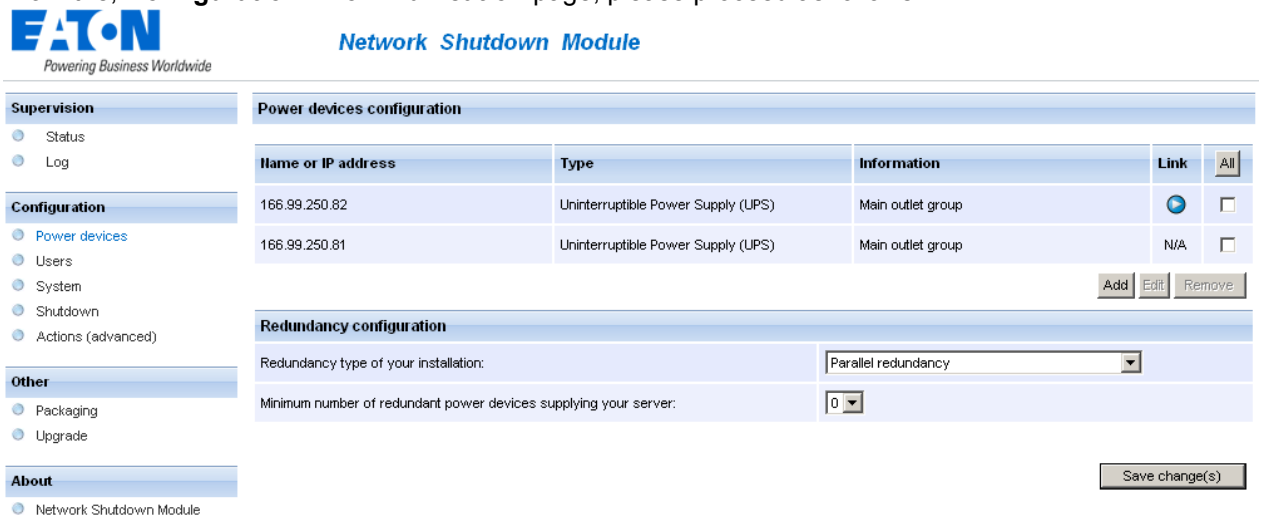
Notes:

- You can sort out your device list by clicking on the column titles (Status / Name / Device Name / Load Level / …).
  A second click will reverse the sorting order.
- **Detailed view access:** Select one of the device in the left menu and the following detailed view page appears.
- **The following icons** of the detailed view offer these functions:

Previous device Back to list view Next device

6.3 Create a multi-UPS configuration

For the multi-UPS configurations, you have to enter the IP address of each UPS that electrically powers the machine hosting the Network Shutdown Module.
From the, **Configuration->Communication** page, please proceed as follows:



Multi-UPS configuration

- Click on the **Add** button
- Key in the first IP address
- Key in the next IP addresses (Click on the **Add** button).
- Select the Redundancy type of your installation (Parallel, STS, Sequential, Serial, Server with multiple power supplies) according to your electrical configuration.

  Note: For the Hot Standby/Sequential UPS Model refer to the specific UPS configuration

- (**optional**) key in 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.

  Note: We warn you against the consequences of this settings, but you also have the possibility to trigger the shutdown action on "Redundancy Lost" alarm in the actions settings.

- Click on the **Save** button

7 Appendix

7.1 Single UPS Mode compatibility

7.1.1 Card/Proxy compatibility

In single UPS Mode, Network Shutdown Module V3 is compatible with following cards/Proxy:

- Network Management Card Minislot 66102 (BA is the Minimum firmware revision)
- Industrial Network Management Card Minislot 66103
- Network Management Card Transverse 66074
- Network Management Card Minislot – 66244
- Network Management Proxy V5

7.1.2 UPSs compatibility

In Single UPS Mode, the following UPSs are compatible through the Cards/Proxy:

- Pulsar, Pulsar M, EX
- Pulsar Extreme C
- Pulsar & Comet EXtreme
- Evolution & Pulsar Evolution
- Pulsar MX, MX
- Pulsar EX RT, Comet EX RT, EXRT

In Multi-UPS mode you also have to check the following Multi-ups mode compatibility list.

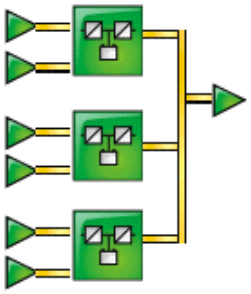
7.2 Multi-UPS Mode Compatibility list

7.2.1 Caution

We strongly recommend you contact trained EATON personnel for setup, in order to guarantee the integrity of your high-availability system.

7.2.2 « simple » configurations

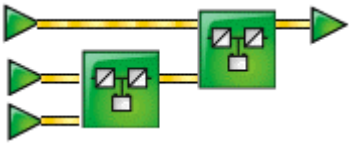
- **UPSs in parallel:**



Single Phase	Pulsar MX 1+1 (2 Max) MX 1+1 (2 Max)

Note: The status of the Normal Secours box is not yet supervised by Network Shutdown Module V3

- **2 UPSs in Hot-Standby:**



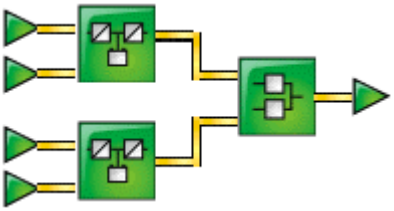
Single Phase	Comet EXRT, EXRT

Note: Specific configuration for 2 UPSs in Hot standby (Sequential redundancy).

- **2 UPSs in serial redundancy:**

Single Phase	Pulsar, Pulsar M, EX Pulsar Extreme C Evolution

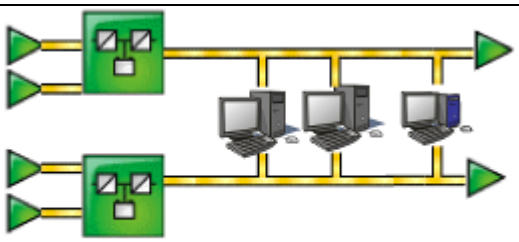
- **2 UPSs through Static Transfer Switch:**



Single Phase	Pulsar, Pulsar M, EX Comet EXRT Pulsar Extreme C STS 16A (without synchro)

Note: The status of the STS Upsilon box is not yet supervised by the Network Shutdown Module V3

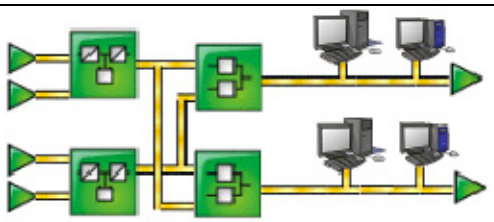
- **2 UPSs powering a server with redundant power supplies:**



Single Phase (without synchro)	Pulsar M, EX Pulsar Extreme C Evolution Pulsar MX, MX Comet EXRT, EXRT

7.2.3 Simple associations of the previous configurations

- **Servers with single power supply (and Multiple STS):**

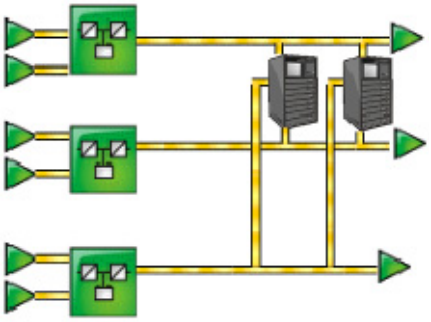


Single Phase (without synchro)	Pulsar Extreme C Pulsar M, EX STS 16A (without synchro)

Notes:

- This configuration has also been tested with 3 STSs
- The Network Shutdown Module V3 is NOT compatible with a configuration where UPS1 and UPS2 are replaced by 2 groups of UPSs.

- **Servers with triple power supplies:**

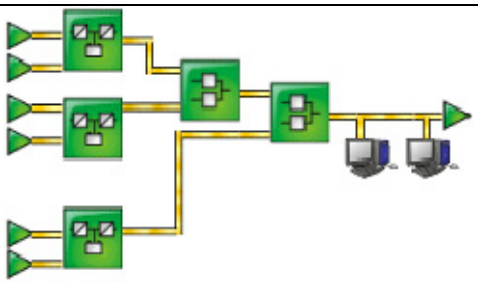


Single Phase (without synchro)	Pulsar, Pulsar M, EX Pulsar MX, MX

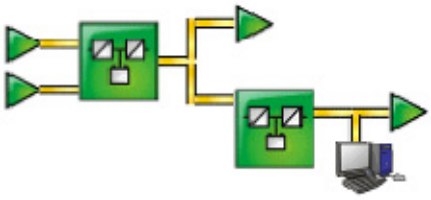
If your configuration is not listed, please contact EATON

7.2.4 Configurations NOT supported

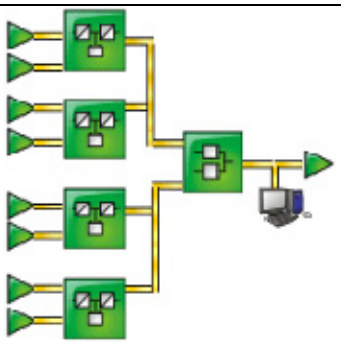
- This configuration with STS in cascade is **NOT** supported by NSM V3



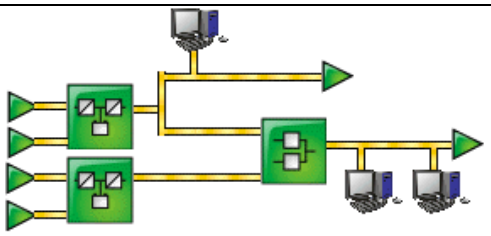
- This configuration with a load derived between the 2 UPSs in serial redundancy is **NOT** supported by NSM V3



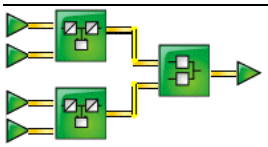
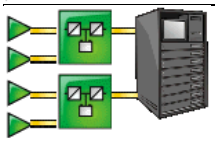
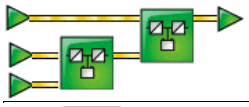
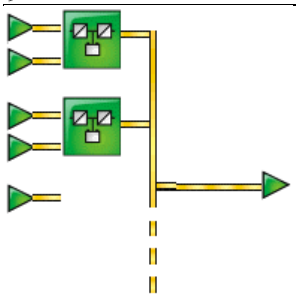
- This configuration with a mix of “Parallel” and “STS” is **NOT** supported by NSM V3



- The following configuration is **NOT** supported, because it is NOT symmetrical on both STS inputs



7.3 Examples of Multi UPS configurations

Electrical drawing	Description	" Minimal number of necessary UPSs"
	2 UPSs of 1000 VA in parallel through a Static Transfer Switch 1 UPS loaded at 75 % 1 UPS loaded at 0%	**1**
	2 UPSs of 1500 VA and a server with redundant power supply Each UPS loaded at 25 %	**1**
	2 UPSs of 1500 VA and a server with redundant power supply Each UPS loaded at 60 %	**2**
	2 UPSs of 3000 VA in hot standby configuration 1 UPS loaded at 33 % 1 UPS loaded at 0%	**1**
	2 UPSs 30 KVA parallel/ redundant mode Each UPS loaded at 40 %	**1**
	2 UPSs 30 KVA parallel/power extension mode Each UPS loaded at 60 %	**2**
	4 UPSs 100 KVA parallel (3 power extension + 1 redundant mode) Each UPS loaded at 70 %	**3**
	8 UPSs 400 KVA parallel (7 power extension + 1 r redundant mode) Each UPS loaded at 80 %	**7**

7.4 Multi-UPS Systems and Event Management

Please refer to the Events and Actions section

7.5 Application deployment and silent installation

7.5.1 Introduction

Network Shutdown Module offers powerful features to easily deploy the application on several computers:

- Silent Installation
- Providing some command line parameters to the installer
- Re-packaging of a customized application

According to your needs you have several possibilities:

First example:
Your computers are powered by a single UPS and you are using the Network Shutdown Module default configuration.

- Step 1: Copy the Network Shutdown Module package on the different computers (according to Operating System)
- Step 2: Execute the installation in silent mode and provide the card IP address as a parameter in the command line

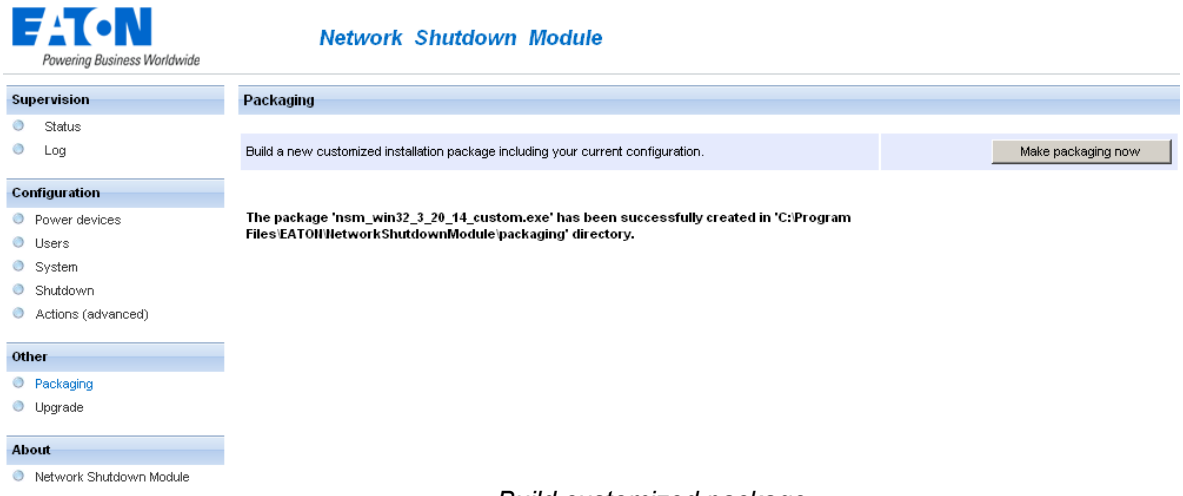
Second example:
Your computers are powered by a Multi UPS system or you don't use Network Shutdown Module default configuration.

- Step 1: Install Network Shutdown Module on a computer (interactive or silent mode)
- Step 2: Configure Network Shutdown Module
- Step 3: Create a customized package (containing your configuration)
- Step 4: Copy this package on the different computers (according to the Operating System)
- Step 5: Execute the installation in silent (or possibly in interactive mode)

7.5.2 Customized installation package

After having customized the Network Shutdown Module configuration (name or IP address of Network Management Card/Proxy, events and actions, etc.), you can build a Network Shutdown Module installation package which contains your specific configuration.

You can then deploy this Network Shutdown Module configuration on other machines which have the same operating system.
Note: Specific configuration include the UPS(s) IP address(es), the event and action, … but not the install path or install mode.
Please proceed as follows to build the customized package (Windows or Linux):



Build customized package

- In the **Package** section, click on the **Build customized package** button to build a customized package.
- From the dialog box, then click on "OK".
- A confirmation message is displayed when the package is built. You will find in this message the path and the name of the new package.
- Copy this package to the other machines in your chosen directory.
  Note that the Customized installation package will be installed in default installation directory.
  > Windows default value is C:\Program Files\EATON\NetworkShutdownModule
  > Linux default value is /usr/local/EATON/NetworkShutdownModule
  > Mac OSX default value is /usr/local/EATON/NetworkShutdownModule
- Execute the package (standard installation or Silent installation).

Important:

- For Repackaging function, If you are running Debian Sarge, Redhat 3,4, Mandriva 2010, SLES 11 , please read the FAQ first.
- If you install a “customized package” on a computer where a “previous version” of Network Shutdown Module is running:
  => The software version will be upgraded but the configuration of the “previous version” will be kept.
  In order to replace a previous installation, you must first uninstall it.

7.5.3 Install the Shutdown Module in silent mode

In addition to Network Shutdown Module installation in standard mode where the user configures the parameters during the installation, it is possible to install Network Shutdown Module in silent mode i.e. with no user interaction.

Follow these steps to install Network Shutdown Module in silent mode:

- Make sure you have administrator rights.

- Build a customized package with specific parameters (ex: The Network Management Card IP address, the events and actions …).
- Copy this package to the "target" machine in your chosen directory.
- (Linux) If necessary execute the command: `chmod 755 nsm_linux_xx_3_xx_xx.run`
- To start the installation procedure, run the command:
  `<Filename> -install -silent` to validate silent mode for Windows.
  `./<Filename> -install -silent` to validate silent mode for (Linux and Mac OSX).

  Or to provide the card IP address as parameter to the installer run the command:
  `<Filename> -install -silent –agentName 192.12.13.14` (Windows)
  `./<Filename> -install –silent –agentName 192.12.13.14` (Linux and Mac OSX)

  Note: for the other options refer to the next paragraph
- The installed software is automatically started (except on Mandriva 2010 where you have to start mgedae process). It is possible to test Network Shutdown Module.

Example of secured deployment script for Linux:

We use ssh to copy the package on several machines and then execute it.
The script iterates on the machine names.

```
#!/bin/sh
#   Notes :
# - Actions to be performed under root account
# - The target.list file contains the target machine names (1 per line)
# - All theses machines must accept automatic ssh connection.
# - It must be authorized with a key generation on the master
#   (machine that executes the script) using "ssh-keygen -t rsa2",
# - Then copy the file ~/.ssh/id_rsa.pub to the target machines
# - and add its content into the file ~/.ssh/known_hosts, ie
#   "cat id_rsa.pub >> ~/.ssh/known_hosts"

for i in `cat target.list`
do
       echo "Network Shutdown Module Installation on machine $i"
       scp nsmlinuxv3xxx.run $i:/tmp
       ssh $i /tmp/nsmlinuxv3xxx.run –install -silent
done
```

7.5.4 Advanced installation options

- The installer is started with following default options:
  `-install -installPath <InstallPath>`
  By default for Windows `<InstallPath> = "C:\Program Files\EATON\NetworkShutdownModule"`
  By default for Linux `<InstallPath> = "/usr/local/EATON/NetworkShutdownModule"`

- The following exclusive options define the installation / uninstallation mode :
  `-install` (with additional options if necessary)
  `-uninstall` (with additional options if necessary)

- Additional options :
  `-silent` Runs the installer without user interactions
  `-installPath <InstallPath>` Provides the installation path as parameter
  `-debug` Starts installer in debug mode
  `-agentName` Provides the Card/proxy IP name as parameter
  `-help` For the complete list of options

7.6 Single UPS Shutdown Sequence

Typical example of the backup time provided by a UPS connected to Network Management Card:

(1) As soon as it detects the loss of AC power, the Mgt. Card notifies the Network Shutdown Modules that the system is running on battery power.

(2) The Mgt. Card then continuously monitors the criteria set to trip the shutdown procedure. The procedure is launched if:

1. the **shutdown time delay** (*) (in seconds), started when the loss of AC power occurred, expires.
2. the UPS **battery level** drops **below** (*) a threshold expressed in %.
3. the UPS **backup time** drops **below** (*) a threshold expressed in seconds.
4. the UPS **backup time** reaches the maximum value of the "shutdown duration" parameters (6)

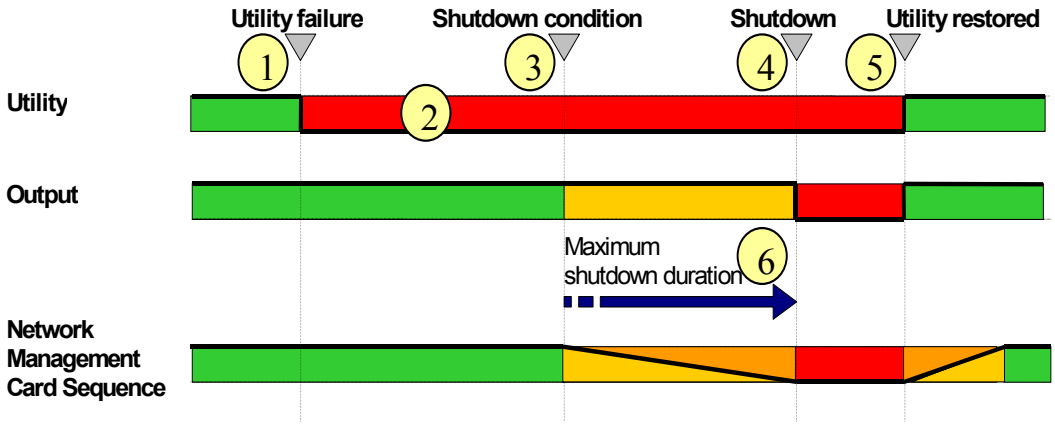
The Mgt. card centralizes the "**shutdown duration**" parameters for all the protected computers (machines hosting Network Shutdown Module).
This fourth tripping criterion is implicit.

(3) The Mgt. Card launches the shutdown procedure:
The Mgt. Card sends to all the Network Shutdown Modules the system shutdown order.
As a result, each Network Shutdown Module proceeds with shutdown of its system.

(4) Once all the computers have been shut down, **the UPS shuts off** (interrupts the supply of power to the loads) to protect the battery.
Note. This function is not authorized on some UPSs.

(5) Once the utility is restored, the UPS restarts all computers (if shut off the UPS output is a function available).

The diagrams below present the sequence.

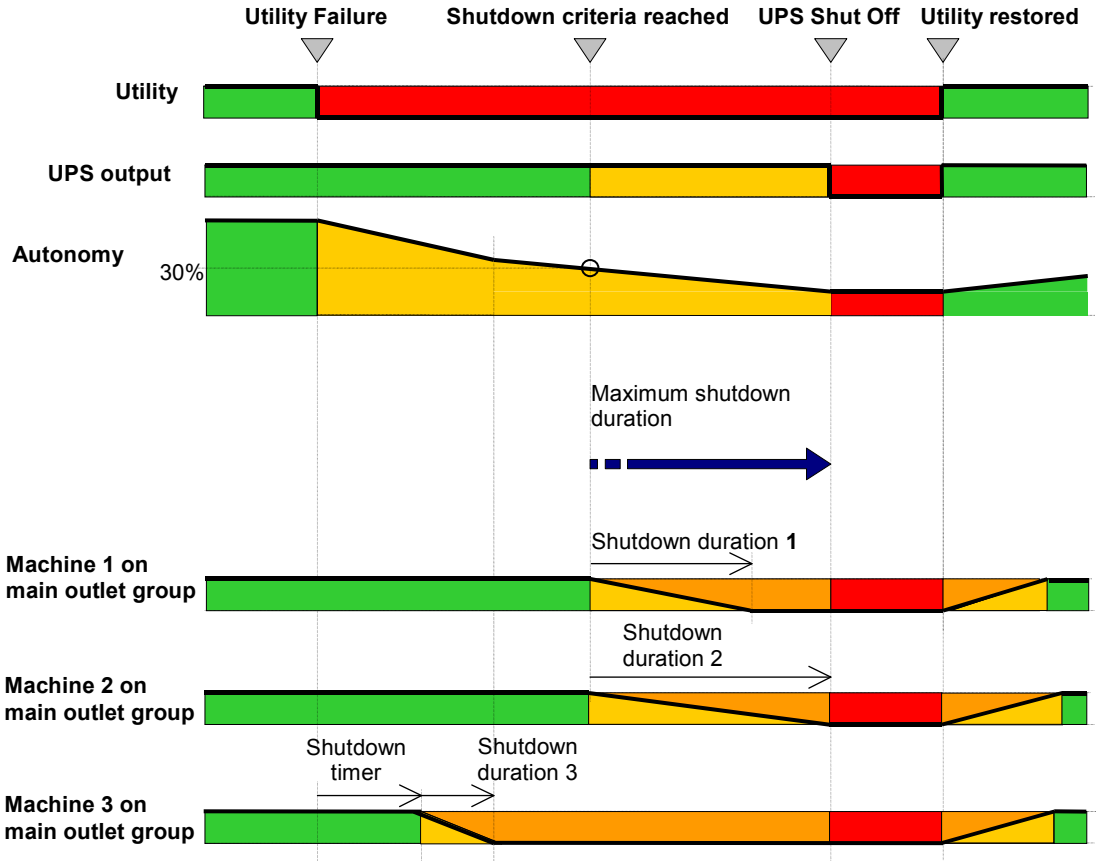

Utility failure
Shutdown condition
Shutdown
Utility restored
1
2
3
4
5
6
Utility
Output
Maximum
shutdown duration
Network
Management
Card Sequence

Example

A UPS protects 3 machines hosting a Network Shutdown Module. Machine 3 is programmed to shut down before the others to take some of the load off the UPS.

	Machine 1	Machine 2	Machine 3
Shutdown timer	None	None	**100 sec**
Shutdown duration	120 sec	**180 sec**	60 sec

The main output shutdown duration is equal to 180 sec. It is the shutdown duration of the machine 2 (maximum of all the shutdown duration).



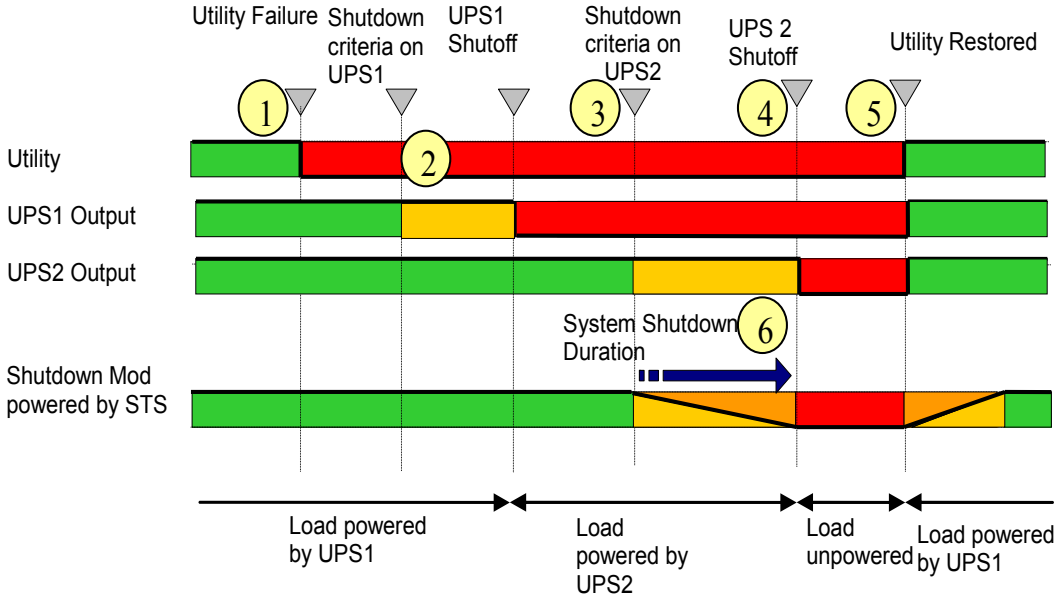
7.7 Multi UPS shutdown sequence (example with Static Transfer Switch)

Typical example of the backup time provided by 2 UPSs in redundancy through Static Transfer Switch.

- The Output load level of the first UPS is less than 50 %.
- The Output load level of the second UPS is 0 %.

1	As soon as they detect the loss of AC power, the Mgt. Cards notify the Network Shutdown Modules that the system is running on battery power.
2	The Network Shutdown Modules continuously compute the “minimum number of necessary UPSs”. In this case we suppose that the minimal number is 1. When the first UPS stops its output, the Static Transfer Switch balances the load on the second UPS. Then we are in a typical « single UPS sequence »
3	• The Mgt. Card launches the shutdown procedure for UPS 2. • As a result, each Network Shutdown Module proceeds with the shutdown of its system.
4	Once all the computers have been shut down, **the UPS shuts off** (interrupts the supply of power to the loads) to protect the battery. Note: This function is not authorized on some UPSs.
5	Once the utility is restored, the UPS restarts all computers (if the shutting off the UPS output function available).

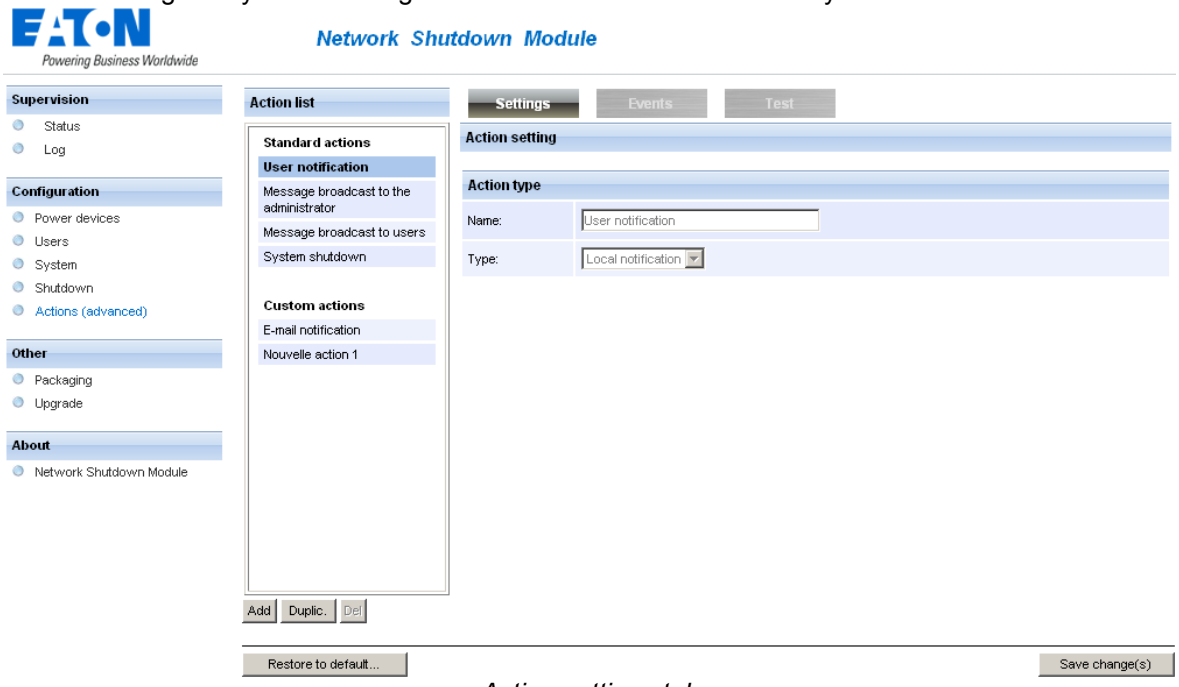
The diagrams below present the sequence.



7.8 Additional information on events and actions

7.8.1 Action settings Tab

In the Action settings tab you can configure the actions that are executed by the Network Shutdown Module.



Action settings tab

Select an action in the **Action List** (eg. **User Notification**) then you have the possibility to select the different tabs for the considered action:

- In the "Settings" tab, you can configure the selected action that is executed by the Network Shutdown Module.
- In the "Events" tab, you can associate the selected action with the event(s) that will be able to trigger the action.
- In the "Test" tab, you can execute the action (by simulating the event occurrence).

- The **Restore to default** button takes you back to the initial configuration.
- The **Save Change(s)** button saves your configuration.

Possible operations on actions

- Add ...: Adds a new action in the Action list, all the parameters must be entered
- **Duplic.**: Duplicates the selected action, with all its parameters (see Add ...)
- **Del**: Deletes the selected action

7.8.1.1 The different actions

There are several actions classified into two categories:

- **Standard actions**
  By default, Network Shutdown Module only uses these actions to ensure the machine's protection and to inform users.

- **Customized actions**
  These user-customized actions give access to additional functions.

Action name	Role
User notification	A message is displayed on the screen of the protected machine, its importance is indicated by a colored symbol: - Green: Information message. - Yellow: Alarm message. - Red: Critical alarm message. - Grey: Communication Lost.
Message broadcast to the administrator	A message is sent over the network to administrators connected to the server protected by Network Shutdown Module. **Note**: This action only occurs if the "Administrator notification" box is checked on the Configuration Network Shutdown Module screen.
Message broadcast to users	A message is sent over the network to users connected to the server protected by Network Shutdown Module. **Note**: This action only occurs if the "Administrator notification" box is checked on the Configuration Network Shutdown Module screen.
System shutdown	System and UPS shutdown according to the configured parameters.
Execute a program	Execution of an application (.exe file) or script (.bat, .cmd, .sh … file).
Send an E-mail	Send an alarm message by e-mail using the SMTP network server.

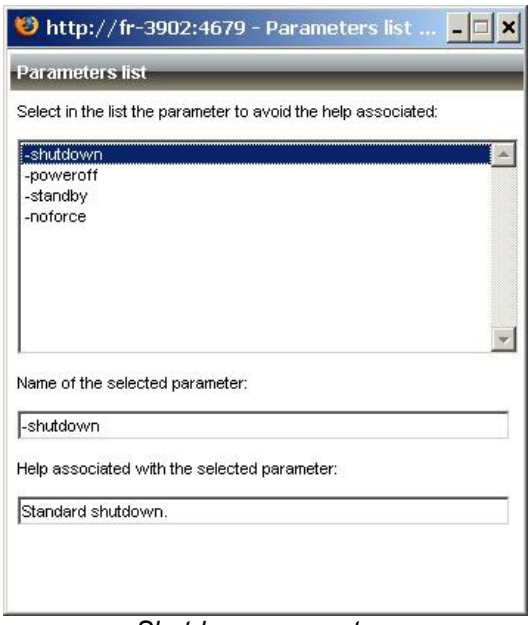
7.8.1.2 Add an action

Follow these steps to add a new action:
1. Click on the **Add** button
2. Enter the name of the new action (unique action identifier)
3. Select the type of action to be added
   Execute
   Send an e-mail

7.8.1.3 «System Shutdown» Action

When personalizing the action **System shutdown** in the action configuration page, you can choose the type of shutdown:

- For Windows, there is a choice of shutdown depending on your system and your requirements.
  Click on the **Parameter** button, to read the help on the shutdown type:
- For Linux, only the shutdown option is currently supported.



Shutdown parameters

- **Shutdown (-shutdown: default selection).** 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 NT, 2000 and XP systems, this configuration is necessary if you want the server to restart as soon as mains power returns.

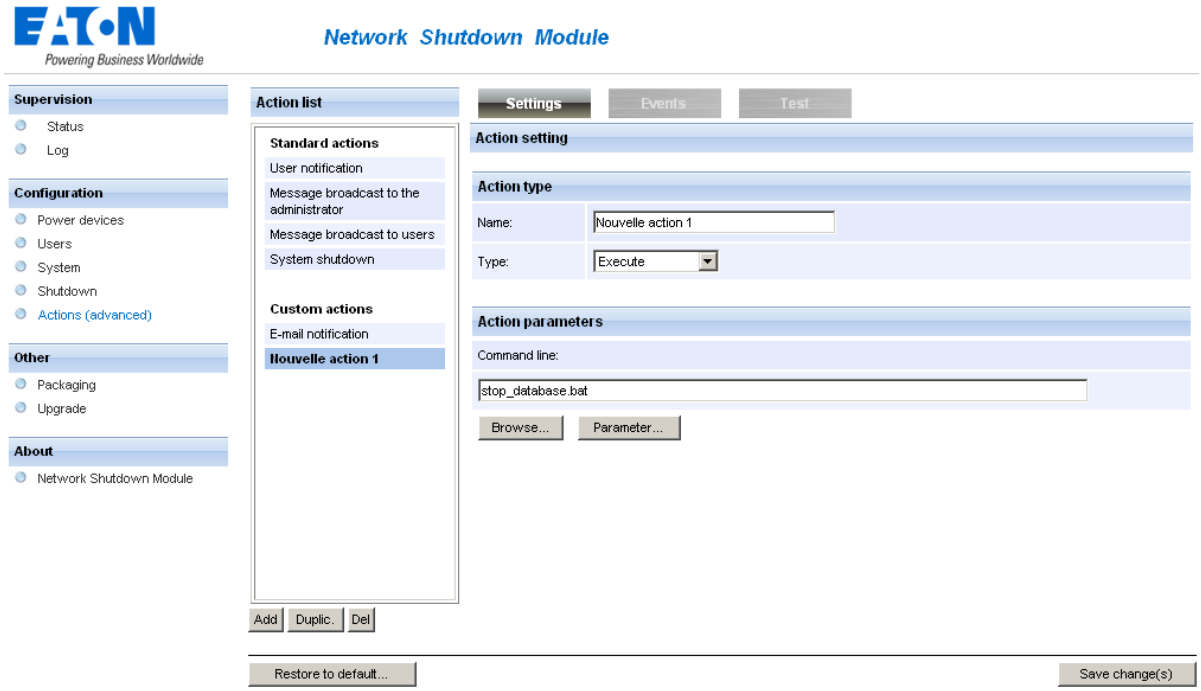
- **Hibernate (-standby).** If your system has the hibernation function (available with Windows 2000), it is better to use it because there are a number of advantages. If the system is shut down, all work in progress and system information are automatically saved to the disk. The computer itself is also de-energized. When mains power returns, all the applications re-open exactly as they were and the user finds himself back in his 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 in fact have this function, Network Shutdown Module nonetheless protects the installation by carrying out the normal (default) shutdown.

- **No force shutdown (-noforce).** Shuts the system down without closing the opened applications e.g. Microsoft Word with an unsaved file. (Warning, the system shutdown is not guaranteed)

- **Power off (-poweroff: system de-energized).** This option shuts down your applications and the system, but does not de-energize the computer. This configuration is advised if you wish to be on hand when the system re-starts. (or for load shedding)

7.8.1.4 Execute Action

Follow these steps to create an action « Execute a program »:

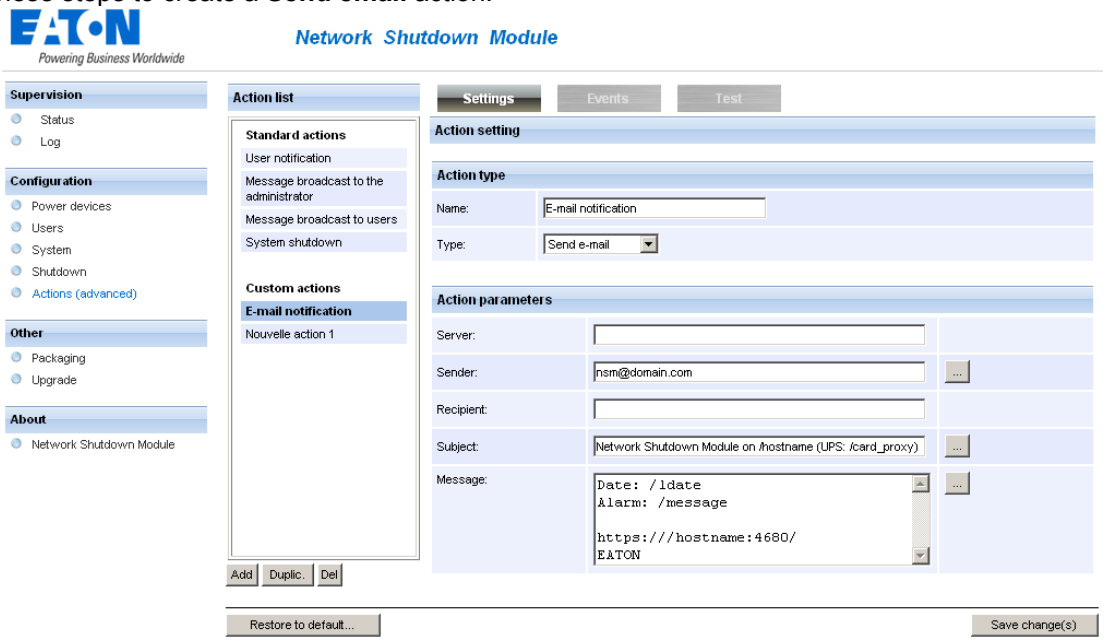


Action settings tab

- Click on the **Add** button
- **Name**: Enter the name of the new action (unique action identifier)
- **Type**: Select **Execute**
- **Command line**: Fill in the command line (the **Browse…** button will help you find the path of the program to be executed).
  The following utilities are supplied to help you customize your **Execute** actions:
  - Shutdown.bat (Windows script) or shutdown.sh (Linux or Mac OSX script)
  - EatonRunAs (Windows utility program)
  - Wait (Windows utility program)
- The **Parameter…** button lets you include the variables in the program.

7.8.1.5 «Send email» Action

Follow these steps to create a **Send email** action:

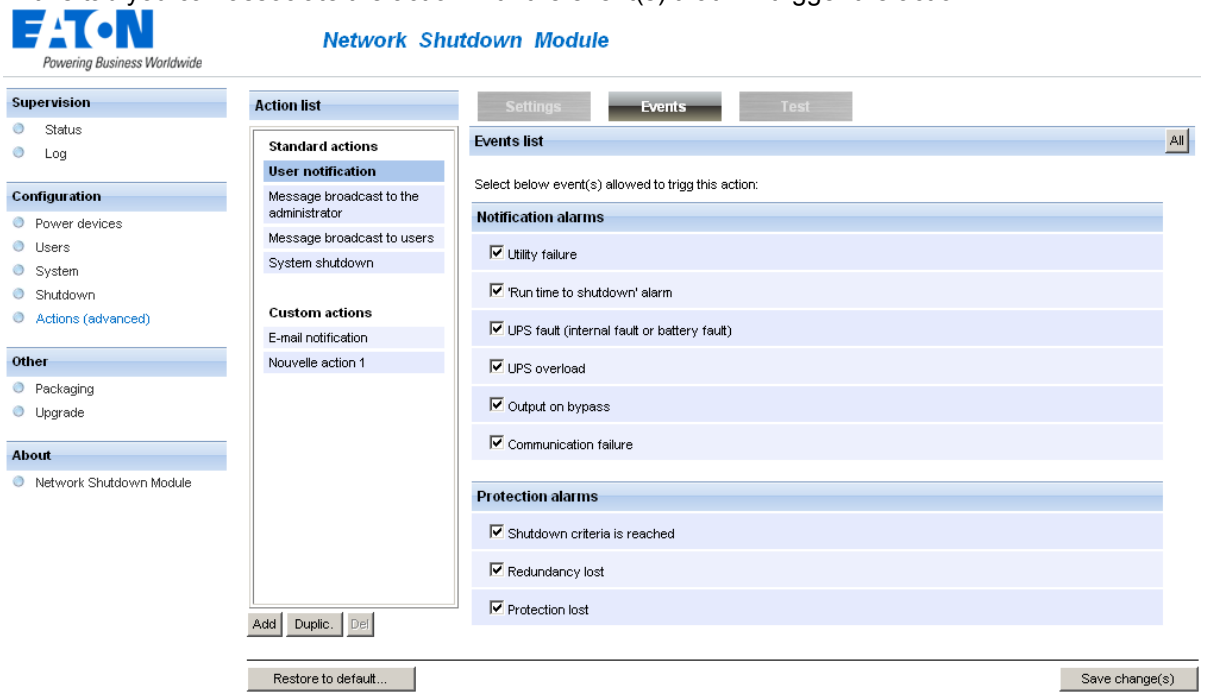


Configure the send email action

- Click on the **Add** button
- **Name**: Enter the name of the new action (unique action identifier)
- **Type**: Select "Send email"
- **Server**: Enter the name of the relay SMTP server (e.g. mail.server.com)
- **Recipient**: Enter the e-mail address. To send the message to several recipients, separate their addresses by a comma or semi colon.
- The **Sender**, **Subject** and **Message** fields can be customized as above.
  Notes:
  1) The "Send an e-mail" action is already pre-configured as above in the installation default. You can use the **Duplicate** function to create new actions configured in the same way.
  2) Some SMTP servers require an email address in the Sender field (and sometimes a valid email address)
- The **...** buttons let you include the variables in the program.
- Click on the **Save Changes** button.

7.8.2 Events Tab

In this tab you can associate the action with the event(s) that will trigger the action :



Events Tab

- Select the action from the left hand side of the above screen
  => The list of events already associated with this event appear (checked boxes)
- Check (or uncheck) the events you wish to associate with this action
- Save your configuration using **Save change(s)** button.

For each event, an on-line help is displayed when the mouse pointer is positioned over it.
Following events can trig the actions. They are classed by category:

7.8.2.1 Notification alarms

These alarms are mainly dedicated to trigger user notification actions:

- Utility failure The system is now powered by the UPS battery
  or [by the utility]

- 'Run time to shutdown' alarm Alarm to indicate the remaining time before system shutdown

- UPS fault (internal fault or battery fault) Internal UPS fault or battery fault was detected
  or [end of Internal/Battery fault]

- UPS overload The output is over loaded
  or [the output load is correct]

- Output on bypass UPS has switched to automatic or manual bypass mode
  or [end of bypass alarm]

- Communication failure Communication between Network Management Card/Proxy and UPS (or NSM) has failed
  or [Communication between Network Management Card/Proxy and UPS is restored]

7.8.2.2 Protection alarms

These alarms are mainly dedicated to trigger operating system shutdown actions:

- Shutdown criteria is reached One of the criteria for which the system should be shutdown has been reached

- Redundancy lost The installation has no redundancy source available anymore
  or [The installation has one or several redundancy source available]

- Protection lost The number of sources ensuring your installation protection is not sufficient
  or [The number of sources ensuring your installation protection is sufficient]

7.8.2.3 Multi UPS Systems and Notification Alarms

With default configuration, the Network Shutdown Module considers that the “Notification Alarms” don’t trigger the shutdown. (only the notification action is performed).

Anyway it is possible to configure a “Shutdown action” when a “Notification Alarm” event is received.
In this case:

- The first alarm reception (from one of the UPSs) will trigger the system shutdown.

7.8.2.4 Multi UPS Systems and Protection Alarms

- Shutdown criteria is reached.
  With default configuration, the Network Shutdown Module triggers the shutdown when this event is received.

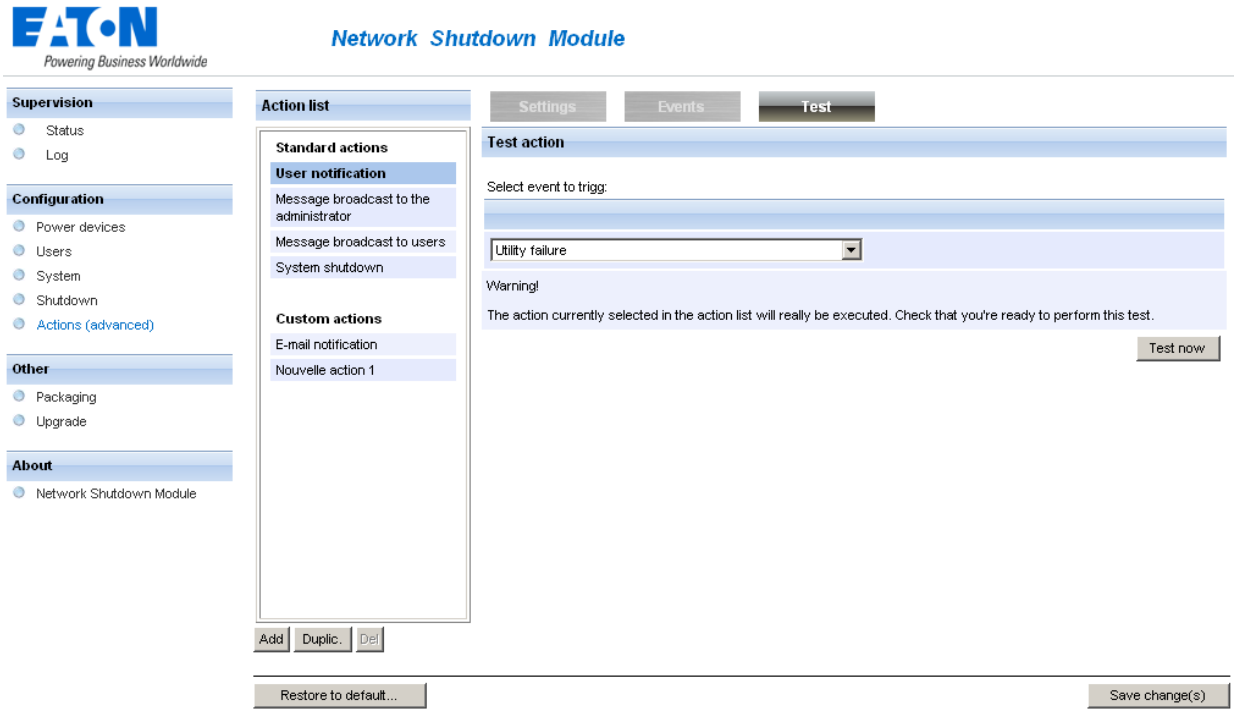
  Anyway it is possible to configure a “Shutdown” action when the following events are received.

- Redundancy lost alarm
  If the user configures a “Shutdown action” when a “Redundancy lost” event is received, the shutdown will occur when the installation has no redundant source available anymore.
  The redundancy Level is configured in Configuration-> Power Devices screen
  Following Alarms are taken into account for this alarm :
  > UPS fault (internal fault or battery fault)
  > Communication failure,
  > Output on bypass,
  > UPS Stopped.

- Protection Lost Alarm
  If the user configures a “Shutdown action” when a “Protection Lost” event is received, the shutdown will occur when the number of sources ensuring your installation protection is not sufficient.
  > Only following UPS faults are taken into account (internal fault or battery fault).
  > The By-Pass events (Automatic or Manual) for maintenance reasons are not taken into account.

7.8.3 Test tab

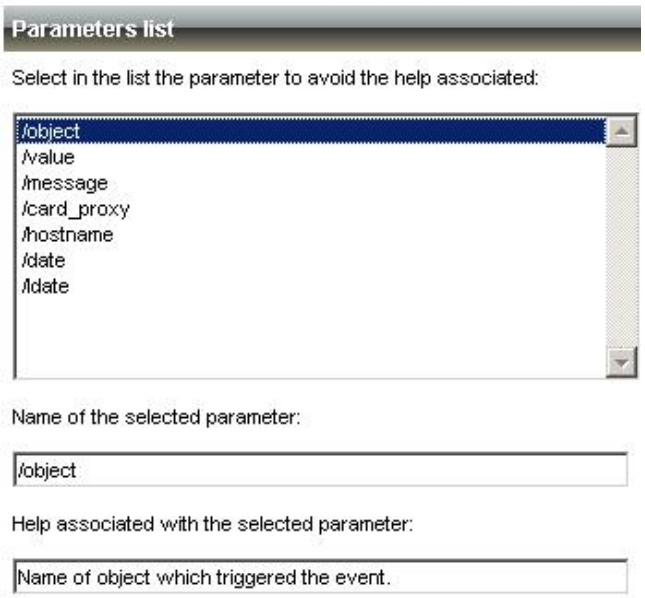
In the "Test" tab you can execute the action (by simulating the event occurrence).
You can select the event.
Warning! This action will **be really executed**. Check that you're ready to perform this test.
Some actions can trigger the shutdown !!



Test Tab

7.8.4 The action parameters (execute and send email)

The **Parameter...** buttons let you access following screen:



The action parameters (execute and send email)

The following parameters can be transmitted to actions:

Parameter	Description
`/object`	Send object name as a parameter
`/value`	Send object value as a parameter
`/message`	Send formatted message as a parameter (refer to label file)
`/date`	Send date in YYYY/MM/DD - HH:MN:SS format
`/ldate`	Send date in the local format of Network Shutdown Module host
`/card_proxy`	Send Network Management Card / Proxy name or IP address
`/hostname`	Send Network Shutdown Module host name or IP address

7.8.5 Software utilities

The following utilities are supplied to help you to customize your "Execute" actions:

7.8.5.1 Shutdown.bat (Windows Script)

The "shutdown.bat" script lets you customize the system shutdown.

It allows:

- synchronous (which block whilst running) or asynchronous programs to be run before shutting the system down.
- programs to be time delayed. The "wait.exe" synchronous utility, distributed by EATON in the Network Shutdown Module default installation directory (<Program Files\EATON\NetworkShutdownModule), is used.
- programs with specific rights to be run. Using eatonRunAs.exe (Windows NT/2000/2003/XP).

- your own system shutdown solution to be used.
- For further information refer to the "shutdown.bat" file in the Network Shutdown Module installation directory. <Program Files\EATON\NetworkShutdownModule\bin\tools>.

7.8.5.2 Shutdown.sh (Linux Script)

The "shutdown.sh" script lets you customize the system shutdown.

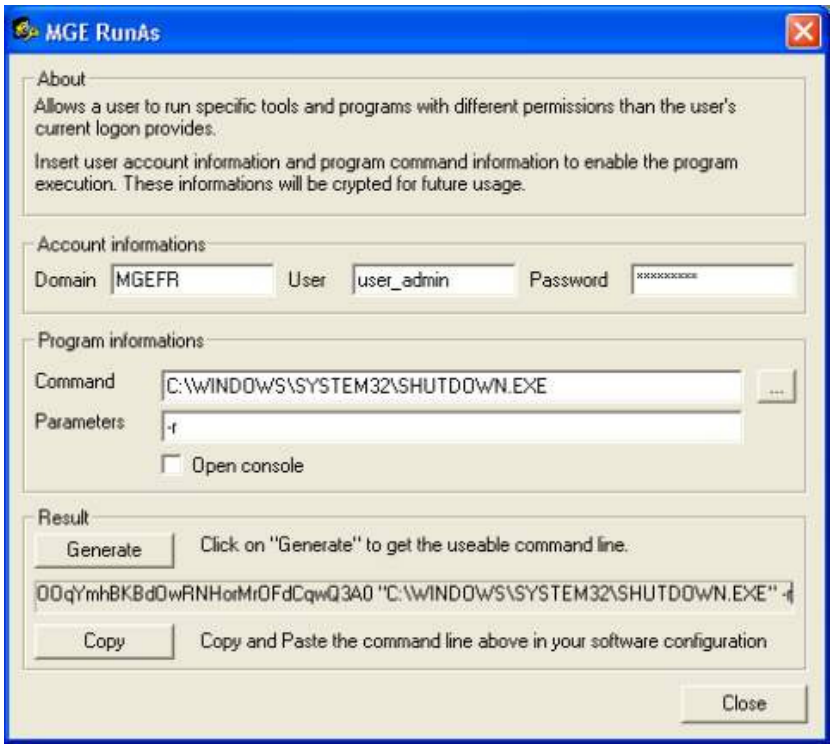
- For further information refer to the "shutdown.sh" file in the Network Shutdown Module installation directory. <install_path>/bin/tools.

7.8.5.3 Wait (Windows)

- **Presentation:**
  "Wait.exe" is a utility used to set up a time delay in a command file (.bat or .cmd file). It can be used in the **shutdown.bat** file to wait until the end of an asynchronous task (non blocking).
- **Location:**
  The program is located in the installation directory <Program Files\EATON\NetworkShutdownModule\bin\tools>.
- **Use:**
  The parameter for the program is the time delay expressed in milliseconds.
- **Example:**
  Wait.exe 2000 <- The system will wait for two seconds.

7.8.5.4 Windows RunAs command or legacy mgeRunAs software utility

- **Presentation:**
  Network Shutdown Module action is carried out in the security context of the user's account. It may be necessary to modify the context before certain actions may be run.
  EatonRunAs.exe is the means for a user to run specific tools and programs with permissions that are different from those assigned to the user's account.
- **Microsoft recently introduced in Windows RunAs Command the possibility to save password (Windows XP Service Pac 2 and more recent versions)**
  We advise you to use following Microsoft command
  runas /profile /user:<my login> /savecred <my_prgram.exe>
  On first execution a password is required. Then it is saved for the next executions.
- On previous Windows versions, you can use mgerunas.exe



- **Localisation:** The executable may be found in the Network Shutdown Module installation directory (by default <Program Files\EATON\NetworkShutdownModule\bin\tools>).

- **Instructions for use:**
  1. Fill in the domain name as well as the user's name and password.
  2. Indicate the program or command to be run using the specified account.
  3. Click the **Generate** button.
  4. Copy the command line and paste it in your application. This line may be used as it is in a Network Shutdown Module **Run** action or in a script file.
  5. The **Open console** option opens a DOS emulation console during execution.

- **Remark.** The information on the user profile is encrypted in the command line. Encryption also depends on the executable and the parameters mentioned. If the name of the executable or one of the parameters is changed, the command line must be generated (encrypted) again.

7.9 FAQ and Error messages

During Installation:

(Linux) I'm running Debian Sarge (or some other distribution), and the NSM installer doesn't display the text properly.
Some older systems are not configured to support UTF-8 by default. • The first solution is to switch your system to be UTF-8 compliant, but which may cause you some problem. To switch a Debian system to UTF-8, simply call the following command as root: `$ dpkg-reconfigure locales` And select UTF-8 (or one of its subsets) as your system's default. • The second solution is to install Network Shutdown Module in English

(Linux) I'm running Debian (Etch or Sarge) at the end of installation, the Web browser is not automatically started
• You can use the systray icon to start the Web browser.

(Linux) I'm running Debian (Sarge) at the end of installation, a temporary file "eatonInstall.xml" is not removed.
• This file is created in the directory where you execute the installer. **Solution:** At the end of installation you can remove manually the file.

During use:

(Linux) Mandriva 2010 / SLES 11 The NSM can not connect to NMC through UDP mode or the communication is lost after some time.
Solution: use the TCP Mode and configure the firewall as indicated in the pre-requisite

(Linux) How to use Network Shutdown Module system tray with Gnome?
The NSM systray isn't displayed in Gnome. Some older versions of Gnome do not allow to automate NSM Systray launch minimized to the tray on login on Gnome. To do so manually : • Open up your GNOME menu, • Select Preferences followed by Sessions. Switch to the Startup programs tab, • Click Add and enter "`<Installation directory>/bin/netsystray/eatonNetSystray`" as the startup command, • Click OK and you're done. To stop NSM Systray from loading upon login, simply remove its entry from the startup programs listing.

(Linux) I'm running WindowMaker or XFCE. Can I use the NSM system tray?
Yes, you can use the systray icon, using:

- wmsystray (http://freshmeat.net/projects/wmsystray/) for WindowMaker,
- xfce4-systray for XFCE.

(Linux) The menu or the systray are missing

Some desktop or windows manager do not provide a way to register menus with sub menu

- Solution 1:
  copy the NSM menu files to your desktop
  `$ cp <installpath>/desktop/*.menu ~/Desktop`

- Solution 2:
  Bookmark the NSM Supervision Page in your favorite Internet Browser,
  > https://< name or IP address of computer hosting NSM>:4680/
  > or http://< name or IP address of computer hosting NSM>:4679/
  and call the uninstall from the command line using
  `<Installation directory>/packaging/nsmInstaller –uninstall`

- Solution 3:
  Add the menu entries using your favorite menu editor
  Entry 1: name : Supervision
  : cmd : `<Installation directory>/packaging/nsmInstaller –openURL <URL>`
  with <URL>
  > https://< name or IP address of computer hosting NSM>:4680/
  > or http://< name or IP address of computer hosting NSM>:4679/

  Entry 2: name : Uninstall
  : `cmd : <Installation directory>/packaging/nsmInstaller –uninstall`

(Linux) Repackaging function on Redhat 3, 4 and Debian Sarge, SLES 11

On these platforms, just after Installation and configuration, the NSM has sufficient user rights to build the customized package.
After a computer reboot, the NSM doesn't have sufficient user rights to build the customized package.
Solutions to build a customized package after reboot:

- Execute the command `/etc/init.d/mge-nsm restart`
- Or you can install again the NSM on your computer, your configuration is not modified.
  Then you have sufficient user rights to build the customized package.
- Or you can use the command line installation parameters to deploy a customised software
- Or you can use Intelligent Power Manager "Mass configuration" feature

(Linux) Repackaging function on Mandriva 2010

On these platforms, just after Installation and configuration, the NSM has sufficient user rights to build the customized package.
After a computer reboot, the NSM doesn't have sufficient user rights to build the customized package.
Solutions to build a customized package after reboot:

- You can install again the NSM on your computer, your configuration is not modified.
  Then you have sufficient user rights to build the customized package.
- Or you can use the command line installation parameters to deploy a customised software
- Or you can use Intelligent Power Manager "Mass configuration" feature

In the HTML pages.

In the page “Configuration -> Power Device”, when I click on the “Add” button the expected page is not displayed
Solution: Check if an anti popup filter is activated on your web browser and configure this filter to accept the page. Check you don’t have the highest security level on IE

Cannot display the UPS properties page. HTTP 404 error with IE.
Solution: Check the URL entered. > https://< name or IP address of computer hosting NSM>:4680/ > or http://< name or IP address of computer hosting NSM>:4679/

When you attempt to view the properties or configuration pages, the browser requests a user name and password.
Solution: The system administrator has protected access to the pages. You must request a user name and password from your administrator.

No UPS information is available.
Solution: Check that communication between the UPS and the computer is OK. Check also that following requirement is met Port 80 must be opened as a destination port (for output) on the machine hosting Network Shutdown Module.

8 Glossary

IP address / name
When TCP/IP is installed on a computer, an address and a name are assigned to the system. Each address or name are unique and the address 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 EATON UPS is at risk, the Network Shutdown Module initiates an orderly shutdown of the computer under the most secure conditions possible.

Shutdown Duration

Shutdown Timer

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

9 Acknowledgements

9.1 SQLite

Huge thanks from the EATON software development team to the SQLite Project http://www.sqlite.org/.
Their generous donation of the source code to the public domain helped us for this project.

9.2 Pi3Web

Huge thanks from the EATON software development team to the Pi3Web Project. http://pi3web.sourceforge.net/

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9.4 OpenSSL

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9.5 Lighttpd

Huge thanks from the EATON software development team to the Lighttpd Project.

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9.6 WxWidget

Huge thanks from the EATON software development team to the `WxWidget` Project.

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